Scribble: The Racket Documentation Tool

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Scribble is a collection of tools for creating prose documents—papers, books, library documentation, etc.—in HTML or PDF (via Latex or Typst) form. More generally, Scribble helps you write programs that are rich in textual content, whether the content is prose to be typeset or any other form of text to be generated programmatically.

This document is itself written using Scribble. You can see its source at https://github.com/racket/scribble/tree/master/scribble-doc/scribblings/scribble, starting with the `"scribble.scrbl"` file.

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1 Getting Started

No matter what you want to do with Scribble, it's best to start by generating a few simple HTML and/or PDF documents. This chapter steps you through the basics, and it ends in §1.10 "Next Steps" with goal-specific advice on how to continue.

1.1 A First Example

Create a file `"mouse.scrbl"` with this content:

```
#lang scribble/base

@title{On the Cookie-Eating Habits of Mice}

If you give a mouse a cookie, he's going to ask for a
glass of milk.
```

The first line's `#lang scribble/base` indicates that the file implements a Scribble document. The document starts in "text mode," and the `@` character escapes to operators like `title`, where the curly braces return to text mode for the arguments to the operator. The rest is document content.

Now run the `scribble` command-line program, specifying a mode for the kind of document that you want as output:

- Run

  ```
  scribble mouse.scrbl
  ```

  to generate HTML as `"mouse.html"`. You may notice that the apostrophe in "he's" turned into a curly apostrophe.

- Run

  ```
  scribble --htmls mouse.scrbl
  ```

  to generate HTML as `"mouse/index.html"`. Sub-sections (which we add next) will appear as separate HTML files in the `"mouse"` directory.

- Run

  ```
  scribble --pdf mouse.scrbl
  ```

  or

  ```
  scribble --typst-pdf mouse.scrbl
  ```

  to generate PDF as `"mouse.pdf"`. The `--pdf` flag will work only if you have `pdflatex` installed, and `--typst-pdf` will work only if `typst` is installed. If you'd like to see the intermediate Latex or Typst, try

```
scribble --latex mouse.scrbl
```

to generate "mouse.tex" or

```
scribble --typst mouse.scrbl
```

to generate "mouse.typ".

See §7 “Running scribble” for more information on the scribble command-line tool.

1.2 Multiple Sections

Add more text to "mouse.scrbl" so that it looks like this:

```
#lang scribble/base

@title{On the Cookie-Eating Habits of Mice}

If you give a mouse a cookie, he's going to ask for a
glass of milk.

@section{The Consequences of Milk}

That ``squeak'' was the mouse asking for milk. Let's
suppose that you give him some in a big glass.

He's a small mouse. The glass is too big---way too
big. So, he'll probably ask you for a straw. You might as
well give it to him.

@section{Not the Last Straw}

For now, to handle the milk moustache, it's enough to give
him a napkin. But it doesn't end there... oh, no.
```

Now, after the first paragraph of the paper, we have two sub-sections, each created by calling section to generate a sub-section declaration. The first sub-section has two paragraphs. The second section, as initiated by the result of the second section call, has a single paragraph.

Run the scribble command(s) from §1.1 “A First Example” again. You may notice the curly double-quotes in the output, and the --- turned into an em dash.

1.3 Splitting the Document Source

As a document grows larger, it's better to split sections into separate source files. The `include-section` operation incorporates a document defined by a `".scrbl"` file into a larger document.

To split the example document into multiple files, change `"mouse.scrbl"` to just

```
#lang scribble/base

@title{On the Cookie-Eating Habits of Mice}

If you give a mouse a cookie, he's going to ask for a
glass of milk.

@include-section["milk.scrbl"]
@include-section["straw.scrbl"]
```

Create `"milk.scrbl"` and `"straw.scrbl"` in the same directory as `"mouse.scrbl"`. In `"milk.scrbl"`, put

```
#lang scribble/base

@title{The Consequences of Milk}

That ``squeak'' was the mouse asking for milk...
```

and in `"straw.scrbl"`, put

```
#lang scribble/base

@title{Not the Last Straw}

For now, to handle the milk moustache, ...
```

Notice that the new files both start with `#lang`, like the original document, and the `section`s from the original document become `title`s in the new documents. Both `"milk.scrbl"` and `"straw.scrbl"` are documents in their own right with their own titles, and they can be individually rendered using `scribble`. Running `scribble` on `"mouse.scrbl"`, meanwhile, incorporates the smaller documents into one document that is the same as before.

1.4 Document Styles

Scribble currently supports only one form of HTML output. You can replace the `"scribble.css"` file for the generated pages, and that's about it. (We expect to add more

styles in the future.)

For Latex-based PDF output, Scribble includes support for multiple page-layout configurations. The "mouse.scrbl" example so far uses the default Latex style. If you plan on submitting the paper to a workshop on programming languages, then—well, you probably need a different topic. But you can start making the current content look right by changing the first line to

```
#lang scribble/acmart
```

If you're instead working toward Racket library documentation, try changing the first line to

```
#lang scribble/manual
```

which produces output with a separate title page, initial content on that page (intended as a brief orientation to the document), and top-level sections turned into chapters that each start on a new page. If you have split the document into multiple files, the first line of the main document file determines the output format.

Using scribble/acmart or scribble/manual does not change the rendered HTML for a document—aside from scribble/manual adding a version number—but it changes the set of bindings available in the document body. For example, with scribble/acmart, the introductory text can be marked as an abstract:

```
#lang scribble/acmart

@title{On the Cookie-Eating Habits of Mice}

@abstract{If you give a mouse a cookie, he's going to
          ask for a glass of milk.}

@section{The Consequences of Milk}

....
```

When rendered as HTML, the abstract shows up as an inset paragraph. If you try to use abstract with the scribble/base or scribble/manual language, then you get an error, because abstract is not defined.

When a document is implemented across multiple files, changing the language of the main document can set the style for all of the parts, but it does not introduce bindings into the other part files. For example, if you change the language of "mouse.scrbl" to scribble/acmart, then abstract becomes available in "mouse.scrbl" but not in "milk.scrbl" or "straw.scrbl". In other words, operator names are lexically scoped.

1.5 More Functions

The scribble/base language provides a collection of basic operations (both scribble/acmart and scribble/manual are supersets of scribble/base). Many of the operations are style variations that you can apply to text:

```
He's a @smaller{small mouse}. The glass is too
@larger{big}---@bold{way @larger{too @larger{big}}}. So, he'll
@italic{probably} ask you for a straw.
```

which renders as

> He's a small mouse. The glass is too big—**way too big**. So, he'll *probably* ask you for a straw.

As you would expect, calls to functions like smaller, larger, and bold can be nested in other calls. They can also be nested within calls to title or section:

```
@section{@italic{Not} the Last Straw}
```

1.5.1 Centering

The centered operation centers a flow of text:

```
If a mouse eats all your cookies, put up a sign that says
@centered{
  @bold{Cookies Wanted}

  @italic{Chocolate chip preferred!}
}
and see if anyone brings you more.
```

which renders as

> If a mouse eats all your cookies, put up a sign that says
>
> **Cookies Wanted**
>
> *Chocolate chip preferred!*
>
> and see if anyone brings you more.

1.5.2 Margin Notes

The `margin-note` operation is used in a similar way, but the rendered text is moved to the margins.

If you use `margin-note`, then the content shows up over here.

1.5.3 Itemizations

The `itemlist` operation creates a sequence of bulleted text, where the `item` operation groups text to appear in a single bullet. The `itemlist` operation is different from the others that we have seen before, because it only accepts values produced by `item` instead of arbitrary text. This difference is reflected in the use of `[...]` for the arguments to `itemlist` instead of `{...}`:

```
@centered{@bold{Notice to Mice}}

@itemlist[@item{We have cookies for you.}
          @item{If you want to eat a cookie,
                you must bring your own straw.}]
```

which renders as

Notice to Mice

- We have cookies for you.
- If you want to eat a cookie, you must bring your own straw.

1.5.4 Tables

The `tabular` function takes a list of lists to organize into a two-dimensional table. By default, no spacing is added between columns, so supply a `#:sep` argument to act as a column separator. For example,

```
@tabular[#:sep @hspace[1]
         (list (list @bold{Animal} @bold{Food})
               (list "mouse"       "cookie")
               (list "moose"       "muffin"))]
```

renders as

Animal	**Food**
mouse	cookie
moose	muffin

1.6 Text Mode vs. Racket Mode for Arguments

When `[...]` surrounds the arguments of an operation, the argument expressions are in Racket mode rather than text mode. Even in Racket mode, `@` can be used to apply operations; once the @ syntax is enabled through a language like `scribble/base` (as opposed to `racket`), it behaves the same in both Racket mode and text mode.

One advantage of using Racket mode for the arguments to `itemlist` is that we can pass a keyword-tagged optional argument to `itemlist`. In particular, if you want a list with numbers instead of bullets, supply the `'ordered` style to `itemlist` using the `#:style` keyword:

```
@itemlist[#:style 'ordered
          @item{Eat cookie.}
          @item{Drink milk.}
          @item{Wipe mouth.}
          @item{...}]
```

An operation doesn't care whether it's used with `[...]` or `{...}`. Roughly, `{...}` forms an argument that is a string. (Only roughly, though. Newlines or uses of `@` within `{...}` complicate the picture, and we'll get back to that soon.) So,

```
@italic{Yummy!}
```

is equivalent to

```
@italic["Yummy!"]
```

which is equivalent to the Racket expression

```
(italic "Yummy!")
```

These equivalences explain why Scribble functions are documented in Racket notation. If you're reading this in HTML format, you can click `italic` above to access its documentation. The documentation won't completely make sense, yet, but it will by the end of this chapter.

What if you want to provide arguments in text mode, but you also want to supply other optional arguments? You can use both `[...]` and `{...}` for an operation, as long as the `[...]` is first, and as long as no characters separate the closing `]` from the opening `{`. For example, calling `italic` is the same as using `elem` with the `'italic` style:

```
@elem[#:style 'italic]{Yummy!}
```

You can also *omit* both `[...]` and `{...}`. In that case, the Racket expression after `@` is used directly instead of applied as an operation. For example,

```
1 plus 2 is @(number->string (+ 1 2)).
```

renders as

> 1 plus 2 is 3.

The call to `number->string` is needed because a naked number is not valid as document content.

1.7 @ Syntax Basics

The @ notation provided by Scribble is just another way of writing Racket expressions. Scribble documents could be constructed using normal Racket notation, without using @ at all, but that would be inconvenient for most purposes. The @ notation makes dealing with textual content much easier.

Whether in text mode or Racket mode, `@` in a document provides an escape to Racket mode. The basic syntax of `@` is

`@` ⟨*cmd*⟩ `[` ⟨*datum*⟩* `]` `{` ⟨*text-body*⟩ `}`

where all three parts after `@` are optional, but at least one must be present. No spaces are allowed between

- `@` and ⟨*cmd*⟩, `[`, or `{`
- ⟨*cmd*⟩ and `[` or `{`; or
- `]` and `{`.

A ⟨*cmd*⟩ or ⟨*datum*⟩ is normal Racket notation, while a ⟨*text-body*⟩ is itself in text mode. A ⟨*cmd*⟩ obviously must not start with `[` or `{`, even though Racket forms could otherwise start with those characters.

The expansion of just `@`⟨*cmd*⟩ into Racket code is

⟨*cmd*⟩

When either `[ ]` or `{ }` are used, the expansion is

`(`⟨*cmd*⟩ ⟨*datum*⟩* ⟨*parsed-body*⟩*`)`

where ⟨*parsed-body*⟩* is the parse result of the ⟨*text-body*⟩. The ⟨*parsed-body*⟩* part often turns out to be a sequence of Racket strings.

In practice, the ⟨*cmd*⟩ is normally a Racket identifier that is bound to a procedure or syntactic form. If the procedure or form expects further text to typeset, then `{...}` supplies the text. If the form expects other data, typically `[...]` is used to surround Racket arguments, instead. Even if an operation's argument is a string, if the string is not used as content text (but instead used as, say, a hyperlink label), then the string is typically provided through `[...]` instead of `{...}`. Sometimes, both `[...]` and `{...}` are used, where the former surround Racket arguments that precede text to typeset. Finally, if a form is a purely Racket-level form with no typeset result, such as a `require` to import more operations, then typically just `@` is used.

For example the text-mode stream

```
@(require scriblib/figure)

@section[#:tag "poetry"]{Of Mice and Cookies}
See @secref["milk"].

@section[#:tag "milk"]{@italic{Important} Milk Supplies}
@figure["straw" @elem{A straw}]{@image["straw.png"]}
```

is equivalent to the Racket-mode sequence

```
(require scriblib/figure) "\n"
"\n"
(section #:tag "poetry" "Of Mice and Cookies") "\n"
"See " (secref "milk") "." "\n"
"\n"
(section #:tag "milk" (italic "Important") " Milk Supplies") "\n"
(figure "straw" (elem "A straw") (image "straw.png")) "\n"
```

Besides showing how different argument conventions are used for different operations, the above example illustrates how whitespace is preserved in the Racket form of a text-mode stream—including newlines preserved as their own strings. Notice how the second `section` gets two arguments for its content, since the argument content for `section` in the source stream includes both the use of an operator and additional text. When an operation like `section` or `italic` accepts content to typeset, it normally accepts an arbitrary number of arguments that together form the content.

In addition to its role for command, a `@` can be followed by `;` to start a comment. If the character after `;` is `{`, then the comment runs until a matching `}`, otherwise the comment runs until the end-of-line:

`@;{` ⟨*comment*⟩ `}`
`@;` ⟨*line-comment*⟩

For more information on the syntax of `@`, see §2 "@ Syntax". The full syntax includes a few more details, such as brackets like `|{...}|` for text-mode arguments while disabling `@` between the brackets.

1.8 Decoding Sequences

In a document that starts `#lang scribble/base`, the top level is a text-mode stream, just like the ⟨*text-body*⟩ in a `@` form. As illustrated in the previous section, such a top-level sequence corresponds to a mixture of Racket-mode strings and operation applications. There's an implicit operation, `decode`, that wraps the whole document to consume this mixture of strings and other values and turn them into a document description.

The `decode` operation implements *flow decoding*, which takes a document stream and breaks it up into sections and paragraphs. Blank lines delimit paragraphs, and the results of operations like `title` and `section` generate "here's the title" or "a new section starts here" declarations that are recognized by `decode`.

A different but related *content decoding* takes place within a paragraph or section title. Content decoding is responsible for converting `---` to an em dash or for converting `"` and `'` to suitable curly quotes.

The decoding process for document's stream is ultimately determined by the `#lang` line that starts the document. The `scribble/base`, `scribble/manual`, and `scribble/acmart` languages all use the same `decode` operation. The `scribble/text` language, however, acts more like a plain-text generator and preprocessor, and it does not perform any such decoding rules. (For more on `scribble/text`, see *Scribble as Preprocessor*.)

More precisely, languages like `scribble/base` apply `decode` only after lifting out all definitions and imports from the document stream.

When the flow decoder is used, after it breaks the input stream into paragraphs, it applies content decoding to strings within the paragraph. When content is wrapped with an operation, however, content decoding does not apply automatically. An operation is responsible for calling a content or flow decoder as it sees fit. Most operations call the decoder; for example, `italic`, `bold`, `smaller`, etc., all decode their arguments. Similarly, `title` and `section` decode the given content for the title or section name. The `literal` and `verbatim` operators, however, do not decode the given strings. For example,

```
@verbatim{---}
```

renders as

```
---
```

Don't confuse decoding with the expansion of @ notation. The source form

```
@verbatim{@(number->string (+ 1 2))}
```

renders as

3

because the source is equivalent to

```
(verbatim (number->string (+ 1 2)))
```

where `(number->string (+ 1 2))` is evaluated to produce the argument to `verbatim`. The `|{...}|` style of brackets is often used with `verbatim`, because `|{...}|` disables @ notation for arguments. For example,

```
@verbatim|{@(number->string (+ 1 2))}|
```

renders as

@(number->string (+ 1 2))

1.9 Pictures

Any value that is convertible to an image can be used directly within a Scribble document. Functions from the `pict` and `2htdp/image` libraries, for example, generate images. For example,

```
@(require pict)

This cookie has lost its chocolate chips:
@(colorize (filled-ellipse 40 40) "beige").
```

renders as

This cookie has lost its chocolate chips: .

1.10 Next Steps

If your immediate goal is to document a Racket library or write literate programs, skip to §4.1 “Getting Started with Documentation”, and then go back to §2 “@ Syntax” and other chapters.

If you are more interested in producing documents unrelated to Racket, continue with §2 “@ Syntax” and then §3 “High-Level Scribble API”. Move on to §6 “Low-Level Scribble API” when you need more power.

If you are interested in text generation and preprocessing, continue with §2 “@ Syntax”, but then switch to *Scribble as Preprocessor*.

2 @ Syntax

The Scribble @ notation is designed to be a convenient facility for free-form text in Racket code, where "@" was chosen as one of the least-used characters in existing Racket code. An @-expression is simply an S-expression in disguise.

Typically, @ notation is enabled through `scribble/base` or similar languages, but you can also add @ notation to an S-expression-based language using the `at-exp` meta-language. For example,

```
#lang at-exp racket
(define v '@op{str})
```

is equivalent to

```
#lang racket
(define v '(op "str"))
```

Using `#lang at-exp racket` is probably the easiest way to try the examples in this chapter.

2.1 The Scribble Syntax at a Glance

To review §1.7 "@ Syntax Basics", the concrete syntax of *@-forms* is roughly

`@` ⟨*cmd*⟩ `[` ⟨*datum*⟩* `]` `{` ⟨*text-body*⟩* `}`

where all three parts after `@` are optional, but at least one should be present. (Spaces are not allowed between the three parts.) Roughly, a form matching the above grammar is read as

`(`⟨*cmd*⟩ ⟨*datum*⟩* ⟨*parsed-body*⟩*`)`

where ⟨*parsed-body*⟩ is the translation of each ⟨*text-body*⟩ in the input. Thus, the initial ⟨*cmd*⟩ determines the Racket code that the input is translated into. The common case is when ⟨*cmd*⟩ is a Racket identifier, which reads as a plain Racket form, with datum arguments and/or string arguments.

Here is one example:

`@foo{blah blah blah}` reads as `(foo "blah blah blah")`

The example shows how an input syntax is read as Racket syntax, not what it evaluates to. If you want to see the translation of an example into S-expression form, add a quote in front of it in a `#lang at-exp racket` module. For example, running

```
#lang at-exp racket
'@foo{blah blah blah}
```

in DrRacket prints the output

```
(foo "blah blah blah")
```

while omitting the quote

```
#lang at-exp racket
@foo{blah blah blah}
```

triggers a syntax error because `foo` is not bound, and

```
#lang at-exp racket
(define (foo str) (printf "He wrote ~s.\n" str))
@foo{blah blah blah}
```

prints the output

```
He wrote "blah blah blah".
```

Here are more examples of @-forms:

`@foo{blah "blah" (`blah'?)}`	reads as	`(foo "blah \"blah\" (`blah'?)")`
`@foo[1 2]{3 4}`	reads as	`(foo 1 2 "3 4")`
`@foo[1 2 3 4]`	reads as	`(foo 1 2 3 4)`
`@foo[#:width 2]{blah blah}`	reads as	`(foo #:width 2 "blah blah")`
`@foo{blah blah` `  yada yada}`	reads as	`(foo "blah blah" "\n"` `  "yada yada")`

`@foo{`
`  blah blah`
`  yada yada`
`}`
	reads as	`(foo`
		`  "blah blah" "\n"`
		`  "yada yada")`

As seen in the last example, multiple lines and the newlines that separate them are parsed to multiple Racket strings. More generally, a ⟨*text-body*⟩ is made of text, newlines, and nested @-forms, where the syntax for @-forms is the same whether it's in a ⟨*text-body*⟩ context as in a Racket context. A ⟨*text-body*⟩ that isn't an @-form is converted to a string expression for its ⟨*parsed-body*⟩; newlines and following indentations are converted to `"\n"` and all-space string expressions.

```
@foo{bar @baz{3}
     blah}
```
reads as
```
(foo "bar " (baz "3") "\n"
     "blah")
```

```
@foo{@b{@u[3] @u{4}}
     blah}
```
reads as
```
(foo (b (u 3) " " (u "4")) "\n"
      "blah")
```

```
@C{while (*(p++))
     *p = '\n';}
```
reads as
```
(C "while (*(p++))" "\n" "  "
   "*p = '\\n';")
```

The command part of an @-form is optional as well. In that case, the @-form is read as a list, which usually counts as a function application, but it also useful when quoted with the usual Racket `quote`:

```
@{blah blah}
```
reads as
```
("blah blah")
```

```
@{blah @[3]}
```
reads as
```
("blah " (3))
```

```
'@{foo
   bar
   baz}
```
reads as
```
'("foo" "\n"
        "bar" "\n"
        "baz")
```

Finally, we can also drop the datum and text parts, which leaves us with only the command—which is read as is, not within a parenthesized form. This is not useful when reading Racket code, but it can be used inside a text block to escape a Racket identifier. A vertical bar (`|`) can be used to delimit the escaped identifier when needed.

```
@foo
```
reads as
```
foo
```

```
@{blah @foo blah}
```
reads as
```
("blah " foo " blah")
```

```
@{blah @foo: blah}
```
reads as
```
("blah " foo: " blah")
```

```
@{blah @|foo|: blah}
```
reads as
```
("blah " foo ": blah")
```

Actually, the command part can be any Racket expression (that does not start with `[`, `{`, or `|`), which is particularly useful with such escapes since they can be used with any expression.

```
@foo{(+ 1 2) -> @(+ 1 2)!}
```
reads as
```
(foo "(+ 1 2) -> " (+ 1 2) "!")
```

```
@foo{A @"string" escape}
```
reads as
```
(foo "A string escape")
```

```
@"@"
```
reads as
```
"@"
```

Note that an escaped Racket string is merged with the surrounding text as a special case. This is useful if you want to use the special characters in your string, but escaping braces are not necessary if they are balanced.

```
@foo{eli@"@"barzilay.org}
```
reads as
```
(foo "eli@barzilay.org")
```

```
@foo{A @"{" begins a block}
```
reads as
```
(foo "A { begins a block")
```

```
@C{while (*(p++)) {                    (C "while (*(p++)) {" "\n" "  "
    *p = '\n';              reads as       "*p = '\\n';" "\n"
  }}                                       "}")
```

In some cases, a text contains many literal @s, which can be cumbersome to quote individually. For such case, braces have an alternative syntax: A block of text can begin with a "`|{`" and terminated accordingly with a "`}|`". Furthermore, any nested @-forms must begin with a "`|@`".

```
@foo|{bar}@{baz}|          reads as  (foo "bar}@{baz")
@foo|{bar |@x{X} baz}|     reads as  (foo "bar " (x "X") " baz")
@foo|{bar |@x|{@}| baz}|   reads as  (foo "bar " (x "@") " baz")
```

In cases when even this is not convenient enough, punctuation characters can be added between the `|` and the braces and the @ in nested forms. (The punctuation is mirrored for parentheses and `<>`s.) With this extension, @-form syntax can be used as a "here string" replacement.

```
@foo|--{bar}@|{baz}--|   reads as  (foo "bar}@|{baz")
@foo|<<{bar}@|{baz}>>|   reads as  (foo "bar}@|{baz")
```

On the flip side of this is, how can an @ sign be used in Racket code? This is almost never an issue, because Racket strings and characters are still read the same, and `@` is set as a non-terminating reader macro so it can be used in Racket identifiers anywhere except in the first character of an identifier. When `@` must appear as the first character of an identifier, you must quote the identifier just like other non-standard characters in normal S-expression syntax: with a backslash or with vertical bars.

```
(define \@email "foo@bar.com")   reads as  (define @email "foo@bar.com")
(define |@atchar| #\@)           reads as  (define @atchar #\@)
```

Note that spaces are not allowed before a `[` or a `{`, or they will be part of the following text (or Racket code). (More on using braces in body texts below.)

```
@foo{bar @baz[2 3] {4 5}}  reads as  (foo "bar " (baz 2 3) " {4 5}")
```

Finally, remember that @-forms are just an alternate form of S-expressions. Identifiers still get their meaning, as in any Racket code, through the lexical context in which they appear. Specifically, when the above @-form appears in a Racket expression context, the lexical environment must provide bindings for `foo` as a procedure or a macro; it can be defined, required, or bound locally (with `let`, for example).

```
> (let* ([formatter (lambda (fmt)
                      (lambda args (format fmt (apply string-append args))))]
         [bf (formatter "*~a*")]
         [it (formatter "/~a/")]
         [ul (formatter "_~a_")]
         [text string-append])
```

```
    @text{@it{Note}: @bf{This is @ul{not} a pipe}.})
"/Note/: *This is _not_ a pipe*."
```

2.2 The Command Part

Besides being a Racket identifier, the ⟨*cmd*⟩ part of an @-form can have Racket punctuation prefixes, which will end up wrapping the *whole* expression.

```
@`',@foo{blah}      reads as  `',@(foo "blah")
@#`#'#,@foo{blah}   reads as  #`#'#,@(foo "blah")
```

When writing Racket code, this means that `@`',@foo{blah}` is exactly the same as `` `@',@foo{blah} `` and `` `',@@foo{blah} ``, but unlike the latter two, the first construct can appear in body texts with the same meaning, whereas the other two would not work (see below).

After the optional punctuation prefix, the ⟨*cmd*⟩ itself is not limited to identifiers; it can be *any* Racket expression.

```
@(lambda (x) x){blah}   reads as  ((lambda (x) x) "blah")
@`(unquote foo){blah}   reads as  `(,foo  "blah")
```

In addition, the command can be omitted altogether, which will omit it from the translation, resulting in an S-expression that usually contains, say, just strings:

```
@{foo bar
  baz}      reads as  ("foo bar" "\n"
                       "baz")

@'{foo bar
   baz}     reads as  '("foo bar" "\n"
                        "baz")
```

If the command part begins with a `;` (with no newline between the `@` and the `;`), then the construct is a comment. There are two comment forms, one for arbitrary-text and possibly nested comments, and another one for line comments:

`@;{` ⟨*any*⟩* `}`

`@;` ⟨*anything-else-without-newline*⟩*

In the first form, the commented body must still parse correctly; see the description of the body syntax below. In the second form, all text from the `@;` to the end of the line *and* all following spaces (or tabs) are part of the comment (similar to `%` comments in TeX).

```
@foo{bar @; comment
     baz@;              reads as  (foo "bar bazblah")
     blah}
```

Tip: if you use an editor in some Scheme mode without support for @-forms, balanced comments can be confusing, since the open brace looks commented out, and the closing one isn't. In such cases it is useful to "comment" out the closing brace too:

```
@;{
  ...
;}
```

so the editor does not treat the file as having unbalanced parentheses.

If only the ⟨*cmd*⟩ part of an @-form is specified, then the result is the command part only, without an extra set of parenthesis. This makes it suitable for Racket escapes in body texts. (More on this below, in the description of the body part.)

```
@foo{x @y z}          reads as  (foo "x " y " z")
@foo{x @(* y 2) z}    reads as  (foo "x " (* y 2) " z")
@{@foo bar}           reads as  (foo " bar")
```

Finally, note that there are currently no special rules for using `@` in the command itself, which can lead to things like:

```
@@foo{bar}{baz}   reads as  ((foo "bar") "baz")
```

2.3 The Datum Part

The datum part can contain arbitrary Racket expressions, which are simply stacked before the body text arguments:

```
@foo[1 (* 2 3)]{bar}     reads as  (foo 1 (* 2 3) "bar")
@foo[@bar{...}]{blah}    reads as  (foo (bar "...") "blah")
```

The body part can still be omitted, which is essentially an alternative syntax for plain (non-textual) S-expressions:

```
@foo[bar]              reads as  (foo bar)
@foo{bar @f[x] baz}    reads as  (foo "bar " (f x) " baz")
```

The datum part can be empty, which makes no difference, except when the body is omitted. It is more common, however, to use an empty body for the same purpose.

```
@foo[]{bar}   reads as  (foo "bar")
@foo[]        reads as  (foo)
@foo          reads as  foo
@foo{}        reads as  (foo)
```

The most common use of the datum part is for Racket forms that expect keyword-value arguments that precede the body of text arguments.

`@foo[#:style 'big]{bar}` reads as `(foo #:style 'big "bar")`

2.4 The Body Part

The syntax of the body part is intended to be as convenient as possible for free text. It can contain almost any text—the only characters with special meaning is `@` for sub-@-forms, and `}` for the end of the text. In addition, a `{` is allowed as part of the text, and it makes the matching `}` be part of the text too—so balanced braces are valid text.

`@foo{f{o}o}` reads as `(foo "f{o}o")`
`@foo{{{}}{}}` reads as `(foo "{{}}{}")`

As described above, the text turns to a sequence of string arguments for the resulting form. Spaces at the beginning and end of lines are discarded, and newlines turn to individual `"\n"` strings (i.e., they are not merged with other body parts); see also the information about newlines and indentation below. Spaces are *not* discarded if they appear after the open `{` (before the closing `}`) when there is also text that follows (precedes) it; specifically, they are preserved in a single-line body.

`@foo{bar}` reads as `(foo "bar")`
`@foo{ bar }` reads as `(foo " bar ")`
`@foo[1]{ bar }` reads as `(foo 1 " bar ")`

If `@` appears in a body, then it is interpreted as Racket code, which means that the @-reader is applied recursively, and the resulting syntax appears as part of the S-expression, among other string contents.

`@foo{a @bar{b} c}` reads as `(foo "a " (bar "b") " c")`

If the nested @ construct has only a command—no body or datum parts—it will not appear in a subform. Given that the command part can be any Racket expression, this makes @ a general escape to arbitrary Racket code.

`@foo{a @bar c}` reads as `(foo "a " bar " c")`
`@foo{a @(bar 2) c}` reads as `(foo "a " (bar 2) " c")`

This is particularly useful with strings, which can be used to include arbitrary text.

`@foo{A @"}" marks the end}` reads as `(foo "A } marks the end")`

Note that the escaped string is (intentionally) merged with the rest of the text. This works for `@` too:

`@foo{The prefix: @"@".}` reads as `(foo "The prefix: @.")`
`@foo{@"@x{y}" --> (x "y")}` reads as `(foo "@x{y} --> (x \"y\")")`

2.4.1 Alternative Body Syntax

In addition to the above, there is an alternative syntax for the body, one that specifies a new marker for its end: use `|{` for the opening marker to have the text terminated by a `}|`.

```
@foo|{...}|                  reads as  (foo "...")
@foo|{"}" follows "{"}|      reads as  (foo "\"}\" follows \"{\"")
@foo|{Nesting |{is}| ok}|    reads as  (foo "Nesting |{is}| ok")
```

This applies to sub-@-forms too—the `@` must be prefixed with a `|`:

```
@foo|{Maze                                (foo "Maze" "\n"
      |@bar{is}              reads as           (bar "is") "\n"
      Life!}|                                    "Life!")

@t|{In |@i|{sub|@"@"s}| too}|  reads as  (t "In " (i "sub@s") " too")
```

Note that the subform uses its own delimiters, `{...}` or `|{...}|`. This means that you can copy and paste Scribble text with @-forms freely, just prefix the `@` if the immediate surrounding text has a prefix.

For even better control, you can add characters in the opening delimiter, between the `|` and the `{`. Characters that are put there (non alphanumeric ASCII characters only, excluding `{` and `@`) should also be used for sub-@-forms, and the end-of-body marker should have these characters in reverse order with paren-like characters (`(`, `[`, `<`) mirrored.

```
@foo|<<<{@x{foo} |@{bar}|.}>>>|  reads as  (foo "@x{foo} |@{bar}|.")
@foo|!!{X |!!@b{Y}...}!!|        reads as  (foo "X " (b "Y") "...")
```

Finally, remember that you can use an expression escape with a Racket string for confusing situations. This works well when you only need to quote short pieces, and the above works well when you have larger multi-line body texts.

2.4.2 Racket Expression Escapes

In some cases, you may want to use a Racket identifier (or a number or a boolean etc.) in a position that touches the following text; in these situations you should surround the escaped Racket expression by a pair of `|` characters. The text inside the bars is parsed as a Racket expression.

```
@foo{foo@bar.}     reads as  (foo "foo" bar.)
@foo{foo@|bar|.}   reads as  (foo "foo" bar ".")
@foo{foo@3.}       reads as  (foo "foo" 3.0)
@foo{foo@|3|.}     reads as  (foo "foo" 3 ".")
```

This form is a generic Racket expression escape, there is no body text or datum part when

you use this form.

```
@foo{foo@|(f 1)|{bar}}   reads as  (foo "foo" (f 1) "{bar}")
@foo{foo@|bar|[1]{baz}}  reads as  (foo "foo" bar "[1]{baz}")
```

This works for string expressions too, but note that unlike the above, the string is (intentionally) not merged with the rest of the text:

```
@foo{x@"y"z}     reads as  (foo "xyz")
@foo{x@|"y"|z}   reads as  (foo "x" "y" "z")
```

Expression escapes also work with *any* number of expressions,

```
@foo{x@|1 (+ 2 3) 4|y}   reads as  (foo "x" 1 (+ 2 3) 4 "y")
```

```
@foo{x@|*                reads as  (foo "x" *
       *|y}                            * "y")
```

It seems that `@||` has no purpose—but remember that these escapes are never merged with the surrounding text, which can be useful when you want to control the sub expressions in the form.

```
@foo{Alice@||Bob@|       reads as  (foo "Alice" "Bob"
     |Carol}                             "Carol")
```

Note that `@|{...}|` can be parsed as either an escape expression or as the Racket command part of an @-form. The latter is used in this case (since there is little point in Racket code that uses braces.

```
@|{blah}|   reads as  ("blah")
```

2.4.3 Comments

As noted above, there are two kinds of @-form comments: `@;{...}` is a (nestable) comment for a whole body of text (following the same rules for @-forms), and `@;...` is a line-comment.

```
@foo{First line@;{there is still a          (foo "First line"
                  newline here;}    reads as       "\n"
     Second line}                                 "Second line")
```

One useful property of line-comments is that they continue to the end of the line *and* all following spaces (or tabs). Using this, you can get further control of the subforms.

```
@foo{A long @;
     single-@;      reads as  (foo "A long single-string arg.")
     string arg.}
```

Note how this is different from using `@||`s in that strings around it are not merged.

2.4.4 Spaces, Newlines, and Indentation

The @-form syntax treats spaces and newlines in a special way is meant to be sensible for dealing with text. As mentioned above, spaces at the beginning and end of body lines are discarded, except for spaces between a `{` and text, or between text and a `}`.

```
@foo{bar}
```
reads as
```
(foo "bar")
```

```
@foo{ bar }
```
reads as
```
(foo " bar ")
```

```
@foo{ bar
     baz }
```
reads as
```
(foo " bar" "\n"
     "baz ")
```

A single newline that follows an open brace or precedes a closing brace is discarded, unless there are only newlines in the body; other newlines are read as a `"\n"` string

```
@foo{bar
}
```
reads as
```
(foo "bar")
```

```
@foo{
  bar
}
```
reads as
```
(foo
  "bar")
```

```
@foo{

  bar

}
```
reads as
```
(foo
  "\n"
  "bar" "\n")
```

```
@foo{
  bar

  baz
}
```
reads as
```
(foo
  "bar" "\n"
  "\n"
  "baz")
```

```
@foo{
}
```
reads as
```
(foo "\n")
```

```
@foo{

}
```
reads as
```
(foo "\n"
     "\n")
```

```
@foo{ bar
     baz }
```
reads as
```
(foo " bar" "\n"
     "baz ")
```

Spaces at the beginning of body lines do not appear in the resulting S-expressions, but the column of each line is noticed, and all-space indentation strings are added so the result has the same indentation. A indentation string is added to each line according to its distance from the leftmost syntax object (except for empty lines). (Note: if you try these examples on a Racket REPL, you should be aware that the reader does not know about the "`> `" prompt.)

```
@foo{
  bar
  baz
  blah
}
```
reads as
```
(foo
  "bar" "\n"
  "baz" "\n"
  "blah")
```

```
@foo{
  begin
    x++;
  end}
```
reads as
```
(foo
  "begin" "\n" "   "
  "x++;" "\n"
  "end")
```

```
@foo{
    a
   b
  c}
```
reads as
```
(foo "  "
     "a" "\n" " "
     "b" "\n"
     "c")
```

If the first string came from the opening `{` line, it is not prepended with an indentation (but it can affect the leftmost syntax object used for indentation). This makes sense when formatting structured code as well as text (see the last example in the following block).

```
@foo{bar
       baz
     bbb}
```
reads as
```
(foo "bar" "\n" "   "
     "baz" "\n"
     "bbb")
```

```
@foo{ bar
        baz
      bbb}
```
reads as
```
(foo " bar" "\n" "    "
     "baz" "\n" " "
     "bbb")
```

```
@foo{bar
   baz
   bbb}
```
reads as
```
(foo "bar" "\n"
     "baz" "\n"
     "bbb")
```

```
@foo{ bar
   baz
   bbb}
```
reads as
```
(foo " bar" "\n"
     "baz" "\n"
     "bbb")
```

```
@foo{ bar                    (foo " bar" "\n"
   baz              reads as      "baz" "\n" "   "
     bbb}                        "bbb")

@text{Some @b{bold           (text "Some " (b "bold" "\n"
  text}, and         reads as                  "text")", and" "\n"
  more text.}                                        "more text.")
```

Note that each @-form is parsed to an S-expression that has its own indentation. This means that Scribble source can be indented like code, but if indentation matters then you may need to apply indentation of the outer item to all lines of the inner one. For example, in

```
@code{
  begin
    i = 1, r = 1
    @bold{while i < n do
            r *= i++
          done}
  end
}
```

a formatter will need to apply the 2-space indentation to the rendering of the `bold` body.

Note that to get a first-line text to be counted as a leftmost line, line and column accounting should be on for the input port (`use-at-readtable` turns them on for the current input port). Without this,

```
@foo{x1
       x2
       x3}
```

will not have 2-space indentations in the parsed S-expression if source accounting is not on, but

```
@foo{x1
       x2
     x3}
```

will (due to the last line). Pay attention to this, as it can be a problem with Racket code, for example:

```
@code{(define (foo x)
        (+ x 1))}
```

For rare situations where spaces at the beginning (or end) of lines matter, you can begin (or end) a line with a `@||`.

```
@foo{                    (foo
  @|| bar @||   reads as   " bar " "\n"
  @|| baz}                 " baz")
```

3 High-Level Scribble API

3.1 Base Document Format

`#lang scribble/base` package: `scribble-lib`

The `scribble/base` language provides functions and forms that can be used from code written either in Racket or with @ expressions. It essentially extends `racket/base`, except that top-level forms within a module using the `scribble/base` language are treated as document content (like `scribble/doclang`).

The `scribble/base` name can also be used as a library with `require`, in which case it provides only the bindings defined in this section, and it also does not set the reader or set the default rendering format to the Racket manual format.

Functions provided by this library, such as `title` and `italic`, might be called from Racket as

```
(title #:tag "how-to"
       "How to Design " (italic "Great") " Programs")
```

They can also be called with @ notation as

```
@title[#:tag "how-to"]{How to Design @italic{Great} Programs}
```

Although the procedures are mostly designed to be used from @ mode, they are easier to document in Racket mode (partly because we have `scribble/manual`).

3.1.1 Document Structure

```
(title [#:tag tag
        #:tag-prefix tag-prefix
        #:style style
        #:version vers
        #:date date]
        pre-content ...+)       → title-decl?
  tag : (or/c #f string? (listof string?)) = #f
  tag-prefix : (or/c #f string? module-path? hash?) = #f
  style : (or/c style? #f string? symbol? (listof symbol?)) = #f
  vers : (or/c string? #f) = #f
  date : (or/c string? #f) = #f
  pre-content : pre-content?
```

Generates a `title-decl` to be picked up by `decode` or `decode-part`. The decoded *pre-content* (i.e., parsed with `decode-content`) supplies the title content. If *tag* is `#f`, a

tag string is generated automatically from the content. The tag string is combined with the symbol 'part to form the full tag.

The *style* argument can be a style structure, or it can be one of the following: a #f that corresponds to a "plain" style, a string that is used as a style name, a symbol that is used as a style property, or a list of symbols to be used as style properties. For information on styles, see part. For example, a style of 'toc causes sub-sections to be generated as separate pages in multi-page HTML output.

The *tag-prefix* argument is propagated to the generated structure (see §6.3.2 "Tags"). If *tag-prefix* is a module path, it is converted to a string using module-path-prefix->string. Similarly, if *tag-prefix* is a hash table with 'tag-prefix mapped to a module path, then it is replaced with a hash table where 'tag-prefix is mapped to a string. When *tag-prefix* as a hash table is used for the main part in a document rendered by `raco setup`, `raco setup` uses some keys to configure the document's rendering; see scribblings in §6.3 "Controlling `raco setup` with `"info.rkt"` Files" for more information.

The *vers* argument is propagated to the title-decl structure. Use "" as *vers* to suppress version rendering in the output.

The *date* argument is propagated to the title-decl structure via a document-date style property. In HTML output, a nonempty date is shown in the version box. In LaTeX output, a supplied date is passed to the \date command. If *date* is #f (the default), HTML omits the date and LaTeX uses the document class's default, typically \today. Use "" as *date* to suppress the date in both formats.

The section title is automatically indexed by decode-part. For the index key, leading whitespace and a leading "A", "An", or "The" (followed by more whitespace) is removed.

Changed in version 1.70 of package `scribble-lib`: A nonempty #:date is now displayed in HTML output.

```
(section [#:tag tag
          #:tag-prefix tag-prefix
          #:style style]
          pre-content ...+)       → part-start?
  tag : (or/c #f string? (listof string?)) = #f
  tag-prefix : (or/c #f string? module-path? hash?) = #f
  style : (or/c style? #f string? symbol? (listof symbol?)) = #f
  pre-content : pre-content?
```

Like title, but generates a part-start of depth 0 to be picked up by decode or decode-part.

```
(subsection [#:tag tag
             #:tag-prefix tag-prefix
             #:style style]
             pre-content ...+)       → part-start?
```

```
  tag : (or/c #f string? (listof string?)) = #f
  tag-prefix : (or/c #f string? module-path? hash?) = #f
  style : (or/c style? #f string? symbol? (listof symbol?)) = #f
  pre-content : pre-content?
```

Like section, but generates a part-start of depth 1.

```
(subsubsection [#:tag tag
                #:tag-prefix tag-prefix
                #:style style]
                pre-content ...+)       → part-start?
  tag : (or/c #f string? (listof string?)) = #f
  tag-prefix : (or/c #f string? module-path? hash?) = #f
  style : (or/c style? #f string? symbol? (listof symbol?)) = #f
  pre-content : pre-content?
```

Like section, but generates a part-start of depth 2.

```
(subsubsub*section [#:tag tag]
                   pre-content ...+) → paragraph?
  tag : (or/c #f string? (listof string?)) = #f
  pre-content : pre-content?
```

Similar to section, but merely generates a paragraph that looks like an unnumbered section heading (for when the nesting gets too deep to include in a table of contents).

```
(include-section module-path)
```

Requires *module-path* and returns its doc export (without making any imports visible to the enclosing context). Since this form expands to require, it must be used in a module or top-level context.

```
(author auth ...) → block?
  auth : content?
```

Generates a paragraph with style name 'author to show the author(s) of a document, where each author is represented by content. Normally, this function is used after title for the beginning of a document. See also author+email.

Examples:

```
@author{Alice P. Racketeer}
```

```
(author+email  author-name
               email
              [#:obfuscate? obfuscate?]) → element?
  author-name : content?
  email : string?
  obfuscate? : any/c = #f
```

Combines an author name with an e-mail address. If *obfuscate?* is true, then the result obscures the e-mail address slightly to avoid address-harvesting robots.

Note that author+email is not a replacement for author. The author+email function is often used in combination with author.

Examples:

```
@author[(author+email "Bob T. Scribbler" "bob@racket-lang.org")]
```

3.1.2 Blocks

```
(para [#:style style] pre-content ...) → paragraph?
  style : (or/c style? string? symbol? #f) = #f
  pre-content : pre-content?
```

Creates a paragraph containing the decoded *pre-content* (i.e., parsed with decode-paragraph).

The *style* argument can be a style, #f to indicate a "plain" style, a string that is used as a style name, or a symbol that is used as a style name. (Note that section and para treat symbols differently as *style* arguments.)

```
(nested [#:style style] pre-flow ...) → nested-flow?
  style : (or/c style? string? symbol? #f) = #f
  pre-flow : pre-flow?
```

Creates a nested flow containing the decoded *pre-flow* (i.e., parsed with decode-flow).

The *style* argument is handled the same as para. The 'inset and 'code-inset styles cause the nested flow to be inset compared to surrounding text, with the latter particularly intended for insetting code. The default style is specified by the output destination (and tends to inset text for HTML output and not inset for Latex output).

```
(centered pre-flow ...) → nested-flow?
  pre-flow : pre-flow?
```

Produces a nested flow whose content is centered.

```
(margin-note  pre-flow
              ...
             [#:left? left?
              #:footnote? footnote?]) → block?
  pre-flow : pre-flow?
  left? : any/c = #f
  footnote? : any/c = #f
```

Produces a nested flow that is typeset in the margin, instead of inlined.

If *left?* is true, then the note is shown on the opposite as it would normally be shown (which is the left-hand side for HTML output). Beware of colliding with output for a table of contents.

If *footnote?* is true, then the Latex renderer typesets the content as a footnote instead of a margin note.

Changed in version 1.55 of package `scribble-lib`: Added the `#:footnote?` argument.

```
(margin-note*  pre-content
               ...
              [#:left? left?
               #:footnote? footnote?]) → element?
  pre-content : pre-content?
  left? : any/c = #f
  footnote? : any/c = #f
```

Like `margin-note`, but `margin-note*` can be used in the middle of a paragraph. At the same time, its content is constrained to form a single paragraph in the margin.

Changed in version 1.55 of package `scribble-lib`: Added the `#:footnote?` argument.

```
(itemlist itm ... [#:style style]) → itemization?
  itm : items/c
  style : (or/c style? string? symbol? #f) = #f
```

Constructs an `itemization` given a sequence of items. Typical each *itm* is constructed by `item`, but an *itm* can be a block that is coerced to an `item`. Finally, *itm* can be a list or `splice` whose elements are spliced (recursively, if necessary) into the `itemlist` sequence.

The *style* argument is handled the same as `para`. The `'ordered` style numbers items, instead of just using a bullet.

```
items/c : flat-contract?
```

A contract that is equivalent to the following recursive specification:

```
(or/c item? block? (listof items/c) (spliceof items/c))
```

```
(item pre-flow ...) → item?
  pre-flow : pre-flow?
```

Creates an item for use with `itemlist`. The decoded *pre-flow* (i.e., parsed with `decode-flow`) is the item content.

```
(item? v) → boolean?
  v : any/c
```

Returns `#t` if *v* is an item produced by `item`, `#f` otherwise.

```
(tabular  cells
          [#:style style
           #:pad pad
           #:sep sep
           #:column-properties column-properties
           #:row-properties row-properties
           #:cell-properties cell-properties
           #:sep-properties sep-properties])      → table?
  cells : (listof (listof (or/c block? content? 'cont)))
  style : (or/c style? string? symbol? #f) = #f
  pad : (or/c real? (list/c real? real?) (list/c real? real? real? real?))
      = 0
  sep : (or/c block? content? #f) = #f
  column-properties : (listof any/c) = '()
  row-properties : (listof any/c) = '()
  cell-properties : (listof (listof any/c)) = '()
  sep-properties : (or/c list? #f) = #f
```

Creates a table with the given *cells* content, which is supplied as a list of rows, where each row has a list of cells. The length of all rows must match.

Use `'cont` in *cells* as a cell to continue the content of the preceding cell in a row in the space that would otherwise be used for a new cell. A `'cont` must not appear as the first cell in a row.

The *style* argument is handled the same as `para`. See `table` for a list of recognized style names and style properties.

The default style places no space between table columns. Specify a *pad* list to add padding around each cell's content, where the numbers in a *pad* list are in "ex" units (roughly corresponding to the size of a character). If *pad* is a single number, it is used for all sides of the

cell. If *pad* is a list of two numbers, the first is used on the left and right, and the last is used on the top and bottom. If *pad* is a list of four numbers, they are used in order for left, top, right, and bottom padding.

If *sep* is not `#f`, it is inserted as a new column between every column in the table; the new column's properties are the same as the preceding column's, unless *sep-properties* provides a list of style properties to use. When *sep* would be placed before a `'cont`, a `'cont` is inserted, instead.

The *column-properties*, *row-properties*, and *cell-properties* arguments specify style properties for the columns and cells of a table; see `table-columns` and `table-cells` for a description of recognized properties. The lists do not contain entries for columns potentially introduced for *sep*, and when non-empty, they are extended as needed to match the table size determined by *cells*:

- If the length of *column-properties* is less than the length of each row in *cells*, the last item of the list is duplicated to make the list long enough.
- If the length of *row-properties* is less than the length of *cells*, the last item of the list is duplicated to make the list long enough.
- If the length of *cell-properties* is less than the number of rows in *cells*, then the last element is duplicated to make the list long enough. Each list within *cell-properties* is treated like a *column-properties* list—expanded as needed to match the number of columns in each row.

Each element of *column-properties* or *row-properties* is either a list of style property values or a non-list element that is wrapped as a list. Similarly, for each list that is an element of *cell-properties*, the list's non-list elements are wrapped as nested lists.

If *column-properties* is non-empty, then its list of property lists is converted into a `table-columns` style property that is added to the style specified by *style*—or merged with an existing `table-columns` style property that matches the column shape of *cells*. In addition, if either *row-properties* or *cell-properties* is non-empty, the property lists of *column-properties* are merged with the property lists of *row-properties* and *cell-properties*. If *row-properties* or *cell-properties* is non-empty, the merged lists are converted into a `table-cells` style property that is added to the style specified by *style*—or merged with an existing `table-cells` style property that matches the shape of *cells*.

If the style lists for *column-properties* are both merged with *cell-properties* and converted to `table-columns`, then *style* will contain some redundant information. In that case, `column-attributes` properties will be used from `table-columns`, while other properties will be used from the merger into `table-cells`.

Examples:

```
@tabular[#:sep @hspace[1]
         (list (list "soup" "gazpacho")
               (list "soup" "tonjiru"))]

@tabular[#:pad '(1 0)
```

```
          #:column-properties '(border)
          (list (list "gazpacho" "cold")
                (list "tonjiru"  "hot"))]

@tabular[#:style 'boxed
          #:column-properties '(left right)
          #:row-properties '(bottom-border ())
          (list (list @bold{recipe}   @bold{vegetable})
                (list "caldo verde"   "kale")
                (list "kinpira gobō"  "burdock")
                (list "makizushi"     'cont))]
```

Renders like:

soup gazpacho
soup tonjiru

gazpacho	cold
tonjiru	hot

recipe	**vegetable**
caldo verde	kale
kinpira gobō	burdock
makizushi	

Changed in version 1.1 of package `scribble-lib`: Added the `#:column-properties`, `#:row-properties`, and `#:cell-properties` arguments.
Changed in version 1.12: Changed *sep* insertion before a `'cont`.
Changed in version 1.28: Added the *sep-properties* argument and made the preceding column's properties used consistently if not specified.
Changed in version 1.59: Added the *pad* argument.

```
(verbatim [#:indent indent] elem ...+) → block?
  indent : exact-nonnegative-integer? = 0
  elem : content?
```

Typesets string *elem*s in typewriter font with linebreaks specified by newline characters in string *elem*s. Consecutive spaces in the string *elem*s are converted to `hspace` to ensure that they are all preserved in the output. Additional space (via `hspace`) as specified by *indent* is added to the beginning of each line. A non-string *elem* is treated as content within a single line.

The string *elem*s are *not* decoded with `decode-content`, so `(verbatim "---")` renders with three hyphens instead of an em dash. Beware, however, that *reading* `@verbatim` converts `@` syntax within the argument, and such reading occurs well before arguments to `verbatim` are delivered at run-time. To disable simple `@` notation within the `verbatim` argument, `verbatim` is typically used with `|{...}|` or similar brackets, like this:

```
@verbatim|{
  Use @bold{---} like this...
}|
```

which renders as

```
Use @bold{---} like this...
```

while

```
@verbatim|{
  Use |@bold{---} like this...
}|
```

renders as

```
Use —— like this...
```

Even with brackets like `|{...}|`, beware that consistent leading whitespace is removed by the parser; see §2.4.1 “Alternative Body Syntax” for more information.

See also `literal`.

3.1.3 Text Styles and Content

```
(elem pre-content ... [#:style style]) → element?
  pre-content : pre-content?
  style : (or/c style? string? symbol? #f) = #f
```

Wraps the decoded *pre-content* as an `element` with style *style*.

```
(italic pre-content ...) → element?
  pre-content : pre-content?
```

Like `elem`, but with style `'italic`.

```
(bold pre-content ...) → element?
  pre-content : pre-content?
```

Like `elem`, but with style `'bold`.

```
(tt pre-content ...) → element?
  pre-content : pre-content?
```

Similar to elem, but the 'tt style is used for immediate strings and symbols among the *pre-content* arguments.

To apply the 'tt style uniformly to all *pre-content* arguments, use (elem #:style 'tt *pre-content* ...), instead.

```
(subscript pre-content ...) → element?
  pre-content : pre-content?
```

Like elem, but with style 'subscript.

```
(superscript pre-content ...) → element?
  pre-content : pre-content?
```

Like elem, but with style 'superscript.

```
(smaller pre-content ...) → element?
  pre-content : pre-content?
```

Like elem, but with style 'smaller. When uses of smaller are nested, text gets progressively smaller.

```
(larger pre-content ...) → element?
  pre-content : pre-content?
```

Like elem, but with style 'larger. When uses of larger are nested, text gets progressively larger.

```
(emph pre-content ...) → element?
  pre-content : pre-content?
```

Like elem, but emphasised. Typically, italics are used for emphasis. Uses of emph can be nested; typically this causes the text to alternate between italic and upright.

```
(literal str ...+) → element?
  str : string?
```

Produces an element containing literally *str*s with no decoding via decode-content.

Beware that @ for a literal call performs some processing before delivering arguments to literal. The literal form can be used with |{...}| or similar brackets to disable @ notation within the literal argument, like this:

```
@literal|{@bold{---}}|
```

which renders as

@bold{---}

See also verbatim.

3.1.4 Images

```
(image  path
        [#:scale scale
         #:suffixes suffixes
         #:style style]
         pre-content ...)     → image-element?
  path : (or/c path-string? (cons/c 'collects (listof bytes?)))
  scale : real? = 1.0
  suffixes : (listof #rx"^[.]") = null
  style : (or/c style? string? symbol? #f) = #f
  pre-content : pre-content?
```

Creates an image element from the given path. The decoded *pre-content* serves as the alternate text for contexts where the image cannot be displayed.

If *path* is a relative path, it is relative to the current directory, which is set by `raco setup` to the directory of the main document file. (In general, however, it's more reliable to express relative paths using `define-runtime-path`.) Instead of a path or string, the *path* argument can be a result of `path->main-collects-relative`.

The *scale* argument sets the images scale relative to its default size as determined by the content of *path*. For HTML output, the resulting `image-element` is rendered with an `img` or `object` (for SVG) tag, and *scale* adjusts the `width` and `height` attributes; a class name or other attributes in *style* can effectively override that size.

The strings in *suffixes* are filtered to those supported by given renderer, and then the acceptable suffixes are tried in order. The HTML renderer supports `".png"`, `".gif"`, and `".svg"`, while the Latex renderer supports `".png"`, `".pdf"`, and `".ps"` (but `".ps"` works only when converting Latex output to DVI, and `".png"` and `".pdf"` work only for converting Latex output to PDF).

Note that when the *suffixes* list is non-empty, then the *path* argument should not have a suffix.

Changed in version 1.3 of package `scribble-lib`: Added the `#:style` argument.

3.1.5 Spacing

```
(linebreak) → element?
```

Produces an element that forces a line break.

```
(nonbreaking pre-content ...) → element?
  pre-content : pre-content?
```

Like `elem`, but line breaks are suppressed while rendering the content.

```
(hspace n) → element?
  n : exact-nonnegative-integer?
```

Produces an element containing *n* spaces and style `'hspace`.

```
~ : string?
```

A string containing the non-breaking space character, which is equivalent to `'nbsp` as an element.

```
-~- : string?
```

A string containing the non-breaking hyphen character.

```
?- : string?
```

A string containing the soft-hyphen character (i.e., a suggestion of where to hyphenate a word to break it across lines when rendering).

```
._ : element?
```

Generates a period that ends an abbreviation in the middle of a sentence, as opposed to a period that ends a sentence (since the latter may be typeset with extra space). Use `@._` in a document instead of just `.` for an abbreviation-ending period that is preceded by a lowercase letter and followed by a space.

See `.__` for an example.

```
.__ : element?
```

Generates a period that ends a sentence (which may be typeset with extra space), as opposed to a period that ends an abbreviation in the middle of a sentence. Use `@.__` in a document instead of just `.` for a sentence-ending period that is preceded by an uppercase letter.

The following example illustrates both `._` and `.__`:

```
#lang scribble/base
My name is Mr@._ T@.__ I pity the fool who can't typeset punctuation.
```

3.1.6 Links

```
(hyperlink  url
            pre-content ...
           [#:underline? underline?
            #:style style])          → element?
  url : string?
  pre-content : pre-content?
  underline? : any/c = #t
  style : (or/c style? string? symbol? #f)
        = (if underline? #f "plainlink")
```

The decoded *pre-content* is hyperlinked to *url*. If *style* is not supplied, then *underline?* determines how the link is rendered.

```
(url dest) → element?
  dest : string?
```

Generates a literal hyperlinked URL.

```
(secref  tag
        [#:doc module-path
         #:tag-prefixes prefixes
         #:underline? underline?
         #:link-render-style ref-style
         #:query query])                → element?
  tag : string?
  module-path : (or/c module-path? #f) = #f
  prefixes : (or/c (listof string?) #f) = #f
  underline? : any/c = #t
  ref-style : (or/c link-render-style? #f) = #f
  query : (or/c #f (listof (cons/c symbol? string?))) = #f
```

Inserts a reference to the section tagged *tag*.

If `#:doc` *module-path* is provided, the *tag* refers to a tag with a prefix determined by *module-path*. When `raco setup` renders documentation, it automatically adds a tag prefix to the document based on the source module. Thus, for example, to refer to a section of the Racket reference, *module-path* would be `'(lib "scribblings/reference/reference.scrbl")`.

The `#:tag-prefixes` *prefixes* argument similarly supports selecting a particular section as determined by a path of tag prefixes. When a `#:doc` argument is provided, then *prefixes* should trace a path of tag-prefixed subsections to reach the *tag* section. When `#:doc` is not provided, the *prefixes* path is relative to any enclosing section (i.e., the youngest ancestor that produces a match).

For the result link-element, if ref-style is not #f, then it is attached as a style property and affects the rendering of the link. Alternatively, an enclosing part can have a link-render style that adjusts the rendering style for all links within the part. See link-element for more information about the rendering of section references.

If underline? is #f, then a style is attached to the result link-element so that the hyperlink is rendered in HTML without an underline.

If query is not #f, it adds query parameters to the link along the same lines as link-query-addition.

In Racket documentation that is rendered to HTML, clicking on a section title normally shows the secref call that is needed to link to the section.

Changed in version 1.25 of package scribble-lib: Added the #:link-render-style argument.
Changed in version 1.65: Added the #:query argument.

```
(Secref  tag
         [#:doc module-path
          #:tag-prefixes prefixes
          #:underline? underline?
          #:link-render-style ref-style
          #:query query])                → element?
  tag : string?
  module-path : (or/c module-path? #f) = #f
  prefixes : (or/c (listof string?) #f) = #f
  underline? : any/c = #t
  ref-style : (or/c link-render-style? #f) = #f
  query : (or/c #f (listof (cons/c symbol? string?))) = #f
```

Like secref, but if the rendered form of the reference starts with a word (e.g., “section”), then the word is capitalized.

Changed in version 1.25 of package scribble-lib: Added the #:link-render-style argument.
Changed in version 1.65: Added the #:query argument.

```
(seclink  tag
          [#:doc module-path
           #:tag-prefixes prefixes
           #:underline? underline?
           #:indirect? indirect?
           #:query query]
           pre-content ...)         → element?
  tag : string?
  module-path : (or/c module-path? #f) = #f
  prefixes : (or/c (listof string?) #f) = #f
  underline? : any/c = #t
```

```
  indirect? : any/c = #f
  query : (or/c #f (listof (cons/c symbol? string?))) = #f
  pre-content : pre-content?
```

Like secref, but the link label is the decoded *pre-content* instead of the target section's name.

In addition to secref's arguments, seclink supports a *indirect?* argument. When *indirect?* is true, then the section hyperlink's resolution in HTML is potentially delayed; see 'indirect-link for link-element.

Changed in version 1.65 of package scribble-lib: Added the #:query argument.

```
(other-doc  module-path
           [#:underline? underline?
            #:indirect indirect
            #:query query])          → element?
  module-path : module-path?
  underline? : any/c = #t
  indirect : (or/c #f content?) = #f
  query : (or/c #f (listof (cons/c symbol? string?))) = #f
```

Like secref for the document's implicit "top" tag that raco setup adds to every document that it renders. Use this function to refer to a whole manual instead of secref, in case a special style in the future is used for manual titles.

If *indirect* is not #f, then the link's resolution in HTML can be delayed, like seclink with #:indirect? #t. The *indirect* content is prefixed with "the" and suffixed with "documentation" to generate the rendered text of the link. For example:

```
@other-doc['(lib "parsack/parsack.scrbl")
           #:indirect "Parsec implementation in Racket"]
```

renders as a hyperlink with the text:

```
the Parsec implementation in Racket documentation
```

Changed in version 1.65 of package scribble-lib: Added the #:query argument.

```
(elemtag t pre-content ...) → element?
  t : (or/c taglet? generated-tag?)
  pre-content : pre-content?
```

The tag *t* refers to the content form of *pre-content*.

```
(elemref  t
          pre-content ...
         [#:underline? underline?
          #:query query])          → element?
  t : (or/c taglet? generated-tag?)
  pre-content : pre-content?
  underline? : any/c = #t
  query : (or/c #f (listof (cons/c symbol? string?))) = #f
```

Similar to `seclink`, but the decoded *pre-content* is hyperlinked to *t*, which is normally defined using `elemtag`.

Changed in version 1.65 of package `scribble-lib`: Added the `#:query` argument.

3.1.7 Indexing

```
(index words pre-content ... [#:extras extras]) → index-element?
  words : (or/c string? (listof string?))
  pre-content : pre-content?
  extras : desc-extras/c = (hash)
```

Creates an index element given a plain-text string—or list of strings for a hierarchy, such as `'("strings" "plain")` for a "plain" entry below a more general "strings" entry. As index keys, the strings are "cleaned" using `clean-up-index-string`. The strings (without clean-up) also serve as the text to render in the index. The decoded *pre-content* is the text to appear inline as the index target. The *extras* argument is included in the generated index element as wrapped by `index-desc`.

Use `index` when an index entry should point to a specific word or phrase within the typeset document (i.e., the *pre-content*). Use `section-index`, instead, to create an index entry that leads to a section, instead of a specific word or phrase within the section.

Changed in version 1.54 of package `scribble-lib`: Added the *extras* argument.

```
(index*  words
         word-contents
         pre-content ...
        [#:extras extras]) → index-element?
  words : (listof string?)
  word-contents : (listof list?)
  pre-content : pre-content?
  extras : desc-extras/c = (hash)
```

Like `index`, except that *words* must be a list, and the list of contents render in the index (in parallel to *words*) is supplied as *word-contents*.

Changed in version 1.54 of package scribble-lib: Added the *extras* argument.

```
(as-index pre-content ... [#:extras extras]) → index-element?
  pre-content : pre-content?
  extras : desc-extras/c = (hash)
```

Like index, but the word to index is determined by applying content->string on the decoded *pre-content*.

Changed in version 1.54 of package scribble-lib: Added the *extras* argument.

```
(section-index word ... [#:extras extras]) → part-index-decl?
  word : string?
  extras : desc-extras/c = (hash)
```

Creates a part-index-decl* to be associated with the enclosing section by decode. The *word*s serve as both the keys and as the rendered forms of the keys within the index. The *extras* hash table is wrapped with index-desc for the generated part-index-decl*.

Changed in version 1.54 of package scribble-lib: Added the *extras* argument.

```
(index-section [#:tag tag]) → part?
  tag : (or/c #f string?) = "doc-index"
```

Produces a part that shows the index of the enclosing document. The optional *tag* argument is used as the index section's tag.

3.1.8 Tables of Contents

```
(table-of-contents) → delayed-block?
```

Returns a delayed flow element that expands to a table of contents for the enclosing section. For Latex output, however, the table of contents currently spans the entire enclosing document.

```
(local-table-of-contents [#:style style]) → delayed-block?
  style : (or/c symbol? #f) = #f
```

Returns a delayed flow element that may expand to a table of contents for the enclosing section, depending on the output type. For multi-page HTML output, the flow element is a table of contents; for Latex output, the flow element is empty.

The meaning of the *style* argument depends on the output type, but 'immediate-only normally creates a table of contents that contains only immediate sub-sections of the enclosing section. See also the 'quiet style of part (i.e., in a part structure, not supplied as the *style* argument to local-table-of-contents), which normally suppresses sub-part entries in a table of contents.

3.1.9 Tags

The exports of scribble/tag are all re-exported by scribble/base.

3.2 Racket Manual Format

The scribble/manual language is a major component of Scribble, and it is documented in its own chapter: §4 “Scribbling Documentation”.

3.3 Book Format

#lang scribble/book package: scribble-lib

The scribble/book language is like scribble/base, but configured with Latex style defaults to use the standard book class. Top-level sections are rendered as Latex chapters.

3.4 Report Format

#lang scribble/report package: scribble-lib

The scribble/report language is like scribble/book, but configured with Latex style defaults to use the standard report class.

3.5 SIGPLAN Paper Format

#lang scribble/sigplan package: scribble-lib

The scribble/sigplan language is like scribble/base, but configured with LaTeX style defaults to use the "sigplanconf.cls" class file that is included with Scribble.

preprint

Enables the preprint option. Use preprint only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and preprint:

```
#lang scribble/sigplan @preprint
```

10pt

Enables the 10pt option. Use 10pt only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and 10pt:

```
#lang scribble/sigplan @10pt
```

nocopyright

Enables the nocopyright option. Use nocopyright only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and nocopyright:

```
#lang scribble/sigplan @nocopyright
```

onecolumn

Enables the onecolumn option. Use only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and onecolumn:

```
#lang scribble/sigplan @onecolumn
```

notimes

Disables the use of \usepackage{times} in the generated LaTeX output. Use only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and notimes:

```
#lang scribble/sigplan @notimes
```

noqcourier

Disables the use of \usepackage{qcourier} in the generated LaTeX output. Use only on the same line as #lang, with only whitespace (or other options) between scribble/sigplan and noqcourier:

```
#lang scribble/sigplan @noqcourier
```

The 10pt, preprint, nocopyright, onecolumn, notimes, and noqcourier options can be used together and may appear in any order.

```
(abstract pre-content ...) → block?
  pre-content : pre-content?
```

Generates a nested flow for a paper abstract.

```
(include-abstract module-path)
```

Similar to include-section, but incorporates the document in the specified module as an abstract. The document must have no title or sub-parts.

```
(subtitle pre-content ...) → element?
  pre-content : pre-content?
```

Use as the last argument to `title` to specify a subtitle.

```
(authorinfo name affiliation email) → block?
  name : pre-content?
  affiliation : pre-content?
  email : pre-content?
```

A replacement for `author` that associates an affiliation and e-mail address with the author name.

```
(conferenceinfo conference location) → block?
  conference : pre-content?
  location : pre-content?
(copyrightyear content ...) → block?
  content : pre-content?
(copyrightdata content ...) → block?
  content : pre-content?
(doi content ...) → block?
  content : pre-content?
(exclusive-license) → block?
```

Declares information that is collected into the copyright region of the paper.

```
(to-appear content ...) → block?
  content : pre-content?
```

Declares alternate content for the copyright region of the paper.

Added in version 1.13 of package `scribble-lib`.

```
(category  CR-number
           subcategory
           third-level
          [fourth-level]) → content?
  CR-number : pre-content?
  subcategory : pre-content?
  third-level : pre-content?
  fourth-level : (or/c #f pre-content?) = #f
(terms content ...) → content?
  content : pre-content?
(keywords content ...) → content?
  content : pre-content?
```

Typesets category, term, and keyword information for the paper, which is normally placed immediately after an `abstract` form. See also `http://www.acm.org/about/class/how-to-use`.

For `category`, the *`subcategory`* argument should be in titlecase (i.e., capitalize the first letter of each word) and a phrase at the level of "Programming Languages" or "Software Engineering" (as opposed to a category like "Software" or a third-level name like "Concurrent Programming" or "Processors"). A *`third-level`* phrase should be in titlecase. A *`fourth-level`* phrase, if any, should not be capitalized.

For `terms`, each general term should be in titlecase. Terms are usually drawn from a fixed list, and they are usually optional.

For `keywords`, capitalize only the first letter of the first word, separate phrases by commas, and do not include "and" before the last one. Keywords should be noun phrases, not adjectives.

3.6 ACM Paper Format

`#lang scribble/acmart` package: `scribble-lib`

The `scribble/acmart` language is like `scribble/base`, but configured with LaTeX style defaults to use the `acmart` class for typesetting publications for the Association of Computing Machinery.

It is based on v2.10 of Boris Veytsman's LaTeX package, which has its own documention.

Note: a `scribble/acmart` document must include a `title` and `author`.

Example:

```
#lang scribble/acmart
@title{Surreal Numbers}
@author{Ursula N. Owens}
```

```
manuscript
acmsmall
acmlarge
acmtog
sigconf
siggraph
sigplan
sigchi
sigchi-a
dtrap
tiot
```

tdsci

Enables the given document format. Use the format only on the same line as `#lang`, with only whitespace (or other options) between `scribble/acmart` and the format name:

```
#lang scribble/acmart @acmsmall
```

The `manuscript`, `acmsmall`, `acmlarge`, `acmtog`, `sigconf`, `siggraph`, `sigplan`, `sigchi`, and `sigchi-a` formats are all mutually exclusive.

review
screen
natbib
anonymous
authorversion
nonacm
timestamp
authordraft
acmthm
9pt
10pt
11pt
12pt

Enables the given document format option. Use the option only on the same line as `#lang`, with only whitespace (or other options) between `scribble/acmart` and the format option. Any number of options may be used:

```
#lang scribble/acmart @acmsmall @review @anonymous @natbib
```

If multiple font size options are used, all but the last are ignored.

The official `acmart` release provides these defaults and descriptions:

name	default	description
review	false	A review version: lines are numbered and hyperlinks are colored
screen	"see text"	A screen version: hyperlinks are colored
natbib	true	Whether to use the natbib package
anonymous	false	Whether to make author(s) anonymous
authorversion	false	Whether to generate a special version for the authors' personal use or posting
nonacm	false	Use the class typesetting options for a non-ACM document, which will not include the co
timestamp	false	Whether to put a time stamp in the footer of each page
authordraft	false	Whether author's-draft mode is enabled
acmthm	true	Whether to define theorem-like environments
balance	true	Whether to balance the last page in two column mode
pbalance	false	Whether to balance the last page in two column mode using pbalance package

urlbreakonhyphens	true	Whether to break urls on hyphens

Further details for some of these are provided by the full documentation for the acmart LaTeX class.

In order to disable a default-true option (e.g. `natbib`), call the option as a function with the value `#false`:

```
#lang scribble/acmart @natbib[#f] @sigplan
```

```
(abstract pre-content ...) → block?
  pre-content : pre-content?
```

Generates a nested flow for a paper abstract.

```
(include-abstract module-path)
```

Similar to `include-section`, but incorporates the document in the specified module as an abstract. The document must have no title or sub-parts.

```
(title [#:short short-title
        #:tag tag
        #:tag-prefix prefix
        #:style style
        #:version version
        #:date date]
        title ...)          → title-decl?
  short-title : pre-content? = #f
  tag : (or/c string? (listof string?) #f) = #f
  prefix : (or/c string? module-path? #f) = #f
  style : (or/c style? string? symbol? #f) = #f
  version : (or/c string? #f) = #f
  date : (or/c string? #f) = #f
  title : pre-content?
```

Specifies the title of the document, optionally with a short version of the title for running heads.

```
(subtitle pre-content ...) → content?
  pre-content : pre-content?
```

Specifies a subtitle.

```
(author [#:orcid orcid
         #:affiliation affiliation
         #:email email]
         name ...)                → block?
```

```
  orcid : (or/c pre-content? #f) = #f
  affiliation : (or/c pre-content?          = #f
                      affiliation?
                      (listof pre-content?)
                      (listof affiliation?)
                      #f)
  email : (or/c pre-content? email? (listof email?)) = '()
  name : pre-content?
```

Specifies an author with an optional email address, affiliation, and/or orcid.

```
#lang scribble/acmart
@title{Title}
@author["Unboxed Value"
        #:email (list (email "user@server.com")
                      (email-string "case--Int#@GHC.Prim.info"))]}

@abstract{abstracting abstract title}
```

```
(authornote text ...) → block?
  text : pre-content?
```

Attaches a footnote to an author name.

```
(acmJournal journal ...) → block?
  journal : pre-content?
(acmConference name date venue) → block?
  name : pre-content?
  date : pre-content?
  venue : pre-content?
(acmVolume content ...) → block?
  content : pre-content?
(acmNumber content ...) → block?
  content : pre-content?
(acmArticle content ...) → block?
  content : pre-content?
(acmYear content ...) → block?
  content : pre-content?
(acmMonth content ...) → block?
  content : pre-content?
(acmArticleSeq content ...) → block?
  content : pre-content?
(acmPrice content ...) → block?
  content : pre-content?
(acmISBN content ...) → block?
  content : pre-content?
```

```
(acmDOI content ...) → block?
  content : pre-content?
```

Declares information that is collected into the front-matter region of the paper.

```
(acmBadgeL [#:url url] graphics) → block?
  url : string? = #f
  graphics : string?
(acmBadgeR [#:url url] graphics) → block?
  url : string? = #f
  graphics : string?
```

Display a special badge, such as an artifact evaluation badge, on the left or right of the first page. If *url* is provided, the screen version of the image links to the badge authority.

```
(email text ...) → email?
  text : pre-content?
(email-string text ...) → email?
  text : string?
```

Creates an `email?` object for use with `author`.

`email-string` is like `email` except that `email-string` only takes strings, escapes all `%` and `#` characters in the arguments and typesets the email address with the `'exact-chars` style.

```
(email? email) → boolean?
  email : any/c
```

Returns `#t` if *email* is an *email*, `#f` otherwise.

```
(affiliation [#:position position
              #:institution institution
              #:street-address street-address
              #:city city
              #:state state
              #:postcode postcode
              #:country country])              → affiliation?
  position : (or/c pre-content? #f) = #f
  institution : (listof (or/c pre-content? institution?)) = '()
  street-address : (or/c pre-content? #f) = #f
  city : (or/c pre-content? #f) = #f
  state : (or/c pre-content? #f) = #f
  postcode : (or/c pre-content? #f) = #f
  country : (or/c pre-content? #f) = #f
```

Creates an affiliation? object for use with author.

```
(affiliation? aff) → boolean?
  aff : any/c
```

Returns #t if aff is an affiliation, #f otherwise.

```
(institution [#:departments departments]
             inst ...)                    → institution?
  departments : (or/c pre-content? institution? (listof institution))
              = '()
  inst : institution?
```

Creates an institution? object for use in author.

```
(institution? inst) → boolean
  inst : any/c
```

Returns #t if inst is an institution, #f otherwise.

```
#lang scribble/acmart
@title{Some Title}
@author["David Van Horn"
        #:affiliation @affiliation[
                      #:institution
                      @institution[
                       #:departments (list @institution{Department of Computer Science}
                                           @institution{UMIACS})]{
                         University of Maryland}
                      #:city "College Park"
                      #:state "Maryland"]
        #:email "dvanhorn@cs.umd.edu"]}

@abstract{This is an abstract.}
```

```
(authorsaddresses addresses ...) → block?
  addresses : pre-content?
```

Sets the text for the authors' addresses on the first page in some styles. By default this field is set to the authors and their affiliation information.

The addresses parameter takes the address text. As a special case the empty list removes the addresses field entirely.

```
#lang scribble/acmart @acmsmall
@title{A fancy paper}
@author["Ronon Dex"]
@authorsaddresses{}
```

Added in version 1.26 of package `scribble-lib`.

```
(shortauthors name ...) → element?
  name : pre-content?
```

Sets the text for the names of the authors in the running header.

Added in version 1.29 of package `scribble-lib`.

```
(terms content ...) → content?
  content : pre-content?
(keywords content ...) → content?
  content : pre-content?
```

Typesets term and keyword information for the paper, which is normally placed immediately after an `abstract` or `include-abstract` form. See also `http://www.acm.org/about/class/how-to-use`.

For `terms`, each general term should be in titlecase. Terms are usually drawn from a fixed list, and they are usually optional.

The `keywords` procedure generates the "Additional Key Words and Phrases" section. Capitalize only the first letter of the first word, separate phrases by commas, and do not include "and" before the last one. Keywords should be noun phrases, not adjectives.

```
(startPage content ...) → content?
  content : pre-content?
```

Sets the start page for the paper.

```
(ccsdesc #:number number? content ...) → content?
  number? : #f
  content : pre-content?
```

Declares CCS description with optional numeric code. This generates the "CCS Concepts" section. When using the ACM Computing Classification System tool, it will give you some LaTeX code, for example:

```
\ccsdesc[500]{Software and its engineering~Functional languages}
\ccsdesc[500]{Software and its engineering~Imperative languages}
```

Those calls translate into:

```
@ccsdesc[#:number 500]{Software and its engineering~Functional languages}
@ccsdesc[#:number 500]{Software and its engineering~Imperative languages}
```

```
(received [#:stage stage] date) → content?
  stage : string? = #f
  date : string?
```

Sets the history of the publication. If *stage* is omitted, it defaults to "Received" for the first occurrence and "revised" in subsequent uses.

```
@received{February 2007}
@received[#:stage "revised"]{March 2009}
@received[#:stage "accepted"]{June 2009}
```

```
(teaserfigure content ...) → block?
  content : pre-flow?
```

Creates a teaser figure to appear before main text.

```
(sidebar content ...) → block?
  content : pre-flow?
(marginfigure content ...) → block?
  content : pre-flow?
(margintable content ...) → block?
  content : pre-flow?
```

In the `sigchi-a` format, special sidebars, tables and figures on the margin.

```
(printonly content ...) → block?
  content : pre-flow?
(screenonly content ...) → block?
  content : pre-flow?
(anonsuppress content ...) → block?
  content : pre-flow?
```

Marks content to be included only for print or screen editions, or excluded from anonymous editions.

```
(acks content ...) → block?
  content : pre-flow?
```

Creates an unnumbered section “Acknowledgments” section, unless the `anonymous` mode is selected.

```
(grantsponsor sponsorID name url) → content?
  sponsorID : string?
  name : string?
  url : string?
(grantnum [#:url url] sponsorID num) → content?
  url : string? = #f
  sponsorID : string?
  num : string?
```

All financial support *must* be listed using the `grantsponsor` and `grantnum` commands inside of `acks`.

Here *sponsorID* is the unique ID used to match grants to sponsors, *name* is the name of the sponsor. The *sponsorID* of a `grantnum` must match some *sponsorID* of a `grantsponsor` command.

```
@acks{
  The author thanks Ben Greenman for helpful comments on this
  code. Financial support provided by the @grantsponsor["NSF7000"
  "National Scribble Foundation"]{http://racket-lang.org} under
  grant No.: @grantnum["NSF7000"]{867-5309}.}
```

Added in version 1.20 of package `scribble-lib`.

3.7 JFP Paper Format

`#lang scribble/jfp` package: `scribble-lib`

The `scribble/jfp` language is like `scribble/base`, but configured with Latex style defaults to use the `"jfp1.cls"` class file. The class file is not included with Scribble due to license issues, but if the file is not manually installed into the `scribble/jfp` collections, then it is downloaded on demand to `(find-system-path 'addon-dir)`.

Latex output with `scribble/jfp` uses a main-document version supplied to `title` as the short-form document name (to be used in page headers).

```
(abstract pre-content ...) → block?
  pre-content : pre-content?
```

Generates a nested flow for a paper abstract.

```
(include-abstract module-path)
```

Similar to `include-section`, but incorporates the document in the specified module as an abstract. The document must have no title or sub-parts.

```
(author name ...) → block?
  name : pre-content?
```

A replacement for `author` from `scribble/base`.

```
((author/short short-name ...) long-name ...) → block?
  short-name : pre-content?
  long-name : pre-content?
```

Like `author`, but allows the short-form names (to be used in page headers) to be specified separately from the long-form name.

```
(affiliation place ...) → element?
  place : pre-content?
(affiliation-mark mark ...) → element?
  mark : pre-content?
(affiliation-sep) → element?
```

Use `affiliation` within `author` or the long-name part of `author/short` to specify affiliations after all authors. If different authors have different affiliations, use `affiliation-mark` with a number after each author, and then use `affiliation-mark` before each different affiliation within a single `affiliation`, using `(affiliation-sep)` to separate affiliations.

Example:

```
#lang scribble/jfp

@title{My First Love Story}

@((author/short "Romeo M. and Juliet C.")
  "ROMEO" (affiliation-mark "1")
  " and "
  "JULIET" (affiliation-mark "2")
  @affiliation[
    "House Montague" (affiliation-mark "1")
    (affiliation-sep)
    "House Capulet" (affiliation-mark "2")])
```

3.8 LNCS Paper Format

`#lang scribble/lncs` package: `scribble-lib`

The scribble/lncs language is like scribble/base, but configured with Latex style defaults to use the "llncs.cls" class file. The class file is not included with Scribble due to license issues, but if the file is not manually installed into the scribble/lncs collection, then it is downloaded on demand to (find-system-path 'addon-dir).

```
(abstract pre-content ...) → block?
  pre-content : pre-content?
```

Generates a nested flow for a paper abstract.

```
(include-abstract module-path)
```

Similar to include-section, but incorporates the document in the specified module as an abstract. The document must have no title or sub-parts.

```
(authors auth ...)

auth = (author pre-content-expr ...)
     | (author #:inst str-expr pre-content-expr ...)

  pre-content-expr : pre-content?
  str-expr : string?
```

A replacement for author from scribble/base.

The #:inst should be a number that matches up to one of the arguments to institutes.

```
author
```

For use only in authors.

```
(institutes (institute pre-content-expr ...) ...)

  pre-content-expr : pre-content?
```

The *pre-content-expr*s are used as the institutions of the authors.

```
institute
```

For use only in institutes.

```
(email pre-content-expr ...)
```

Specifies an email address; must be used inside institute.

3.8.1 Example

Here is an example of a paper written in the LNCS format:

For more randomly generated papers, see SCIgen: `http://pdos.csail.mit.edu/scigen`

```
#lang scribble/lncs

@authors[@author[#:inst "1"]{Lauritz Darragh}
         @author[#:inst "2"]{Nikolaj Kyran}
         @author[#:inst "2"]{Kirsten Gormlaith}
         @author[#:inst "2"]{Tamaz Adrian}]

@institutes[
  @institute["University of Southeast Boston"
             @linebreak[]
             @email|{darragh@cs.seboston.edu}|]
  @institute["University of Albion"
             @linebreak[]
             @email|{{nkyran,gorm,tamaz}@cs.albion.ac.uk}|]]

@title{Arak: Low-Energy, Interposable Theory}

@abstract{The implications of client-server symmetries have been
far-reaching and pervasive. Given the current status of
constant-time theory, mathematicians daringly desire the synthesis
of rasterization, which embodies the essential principles of
algorithms. In this work, we describe a client-server tool for
investigating flip-flop gates (Arak), verifying that the
producer-consumer problem can be made homogeneous, secure, and
wireless.}
```

4 Scribbling Documentation

The `scribble/manual` language and associated libraries provide extensive support for documenting Racket libraries. The most significant aspect of support for documentation is the way that source-code bindings are connected to documentation sites through the module namespace—a connection that is facilitated by the fact that Scribble documents are themselves modules that reside in the same namespace. §4.1 "Getting Started with Documentation" provides an introduction to using Scribble for documentation, and the remaining sections document the relevant libraries and APIs in detail.

4.1 Getting Started with Documentation

Although the `scribble` command-line utility generates output from a Scribble document, documentation of Racket libraries is normally built by `raco setup`. This chapter emphasizes the `raco setup` approach, which more automatically supports links across documents.

See §1 "Getting Started" for information on using the `scribble` command-line utility.

4.1.1 Setting Up Library Documentation

To document a collection, including a collection implemented by a package:

- Create a file in your collection with the file extension `".scrbl"`. Beware that the file name you choose will determine the output directory's name, and the directory name must be unique across all installed documents. The remainder of these instructions assume that the file is called `"manual.scrbl"` (but pick a more specific name in practice).
- Start `"manual.scrbl"` like this:

  ```
  #lang scribble/manual

  @title{My Library}

  Welcome to my documentation: @racket[(list 'testing 1 2 3)].
  ```

  The first line starts the file in "text" mode and selects the Racket manual output format. It also introduces bindings like `title` and `racket` for writing Racket documentation.
- Add the following entry to your collection's `"info.rkt"`:

  ```
  (define scribblings '(("manual.scrbl" ())))
  ```

  The `()` above is a list of options. When your document gets large enough that you want it split into multiple pages, add the `'multi-page` option (omitting the quote, since the whole right-hand side of the definition is already quoted).

If you do not already have an "info.rkt" module, here's a suitable complete module:

```
#lang info
(define scribblings '(("manual.scrbl" ())))
```

- Run raco setup to build your documentation. For a collection, optionally supply -l followed by the collection name to limit the build process to that collection.
- For a collection that is installed as user-specific (e.g., the user package scope), the generated documentation is "doc/manual/index.html" within the collection directory. If the collection is installation-wide, however, then the documentation is generated as "manual/index.html" in the installation's "doc" directory.

4.1.2 Racket Typesetting and Hyperlinks

In the document source at the start of this chapter (§4.1.1 "Setting Up Library Documentation"), the Racket expression (list 'testing 1 2 3) is typeset properly, but the list identifier is not hyperlinked to the usual definition. To cause list to be hyperlinked, add a require form like this:

```
@(require (for-label racket))
```

This require with for-label declaration introduces a document-time binding for each export of the racket module. When the document is built, the racket form detects the binding for list, and so it generates a reference to the specification of list. The setup process detects the reference, and it finds the matching specification in the existing documentation, and ultimately directs the hyperlink to that specification.

Hyperlinks based on for-label and racket are the preferred mechanism for linking to information outside of a single document. Such links require no information about where and how a binding is documented elsewhere:

```
#lang scribble/manual
@(require (for-label racket))

@title{My Library}

See also @racket[list].
```

The racket form typesets a Racket expression for inline text, so it ignores the source formatting of the expression. The racketblock form, in contrast, typesets inset Racket code, and it preserves the expression's formatting from the document source.

```
#lang scribble/manual
```

```
@(require (for-label racket))

@title{My Library}

Some example Racket code:

@racketblock[
(define (nobody-understands-me what)
  (list "When I think of all the"
        what
         "I've tried so hard to explain!"))
(nobody-understands-me "glorble snop")
]
```

4.1.3 Section Hyperlinks

A `section` declaration in a document can include a `#:tag` argument that declares a hyperlink-target tag. The `secref` function generates a hyperlink, using the section name as the text of the hyperlink. Use `seclink` to create a hyperlink with text other than the section title.

The following example illustrates section hyperlinks:

```
#lang scribble/manual
@(require (for-label racket))


@title{My Library}

Welcome to my documentation: @racket[(list 'testing 1 2 3)].

@table-of-contents[]


@section[#:tag "chickens"]{Philadelphia Chickens}

Dancing tonight!


@section{Reprise}

See @secref{chickens}.
```

Since the page is so short, the hyperlinks in the above example are more effective if you change the `"info.rkt"` file to add the `'multi-page` flag:

```
(define scribblings '(("manual.scrbl" (multi-page))))
```

A section can have a tag prefix that applies to all tags as seen from outside the section. Such a prefix is automatically given to each top-level document as processed by `raco setup`. Thus, referencing a section tag in a different document requires using a prefix, which is based on the target document's main source file. The following example links to a section in the Racket reference manual:

```
#lang scribble/manual
@(require (for-label racket))
@(define ref-src
   '(lib "scribblings/reference/reference.scrbl"))

@title{My Library}

See also @italic{@secref[#:doc ref-src]{pairs}}.
```

As mentioned in §4.1.2 "Racket Typesetting and Hyperlinks", however, cross-document references based on `(require (for-label ....))` and `racket` are usually better than cross-document references using `secref`.

4.1.4 Defining Racket Bindings

Use `defproc` to document a procedure, `defform` to document a syntactic form, `defstruct` to document a structure type, etc. These forms provide consistent formatting of definitions, and they declare hyperlink targets for `racket`-based hyperlinks.

To document a `my-helper` procedure that is exported by `"helper.rkt"` in the `"my-lib"` collection that contains `"manual.scrbl"`:

- Use `(require (for-label "helper.rkt"))` to import the binding information about the bindings of `"helper.rkt"` for use when typesetting identifiers. A relative reference `"helper.rkt"` works since it is relative to the documentation source.
- Add a `@defmodule[my-lib/helper]` declaration, which specifies the library that is being documented within the section. The `defmodule` form needs an absolute module name `mylib/helper`, instead of a relative reference `"helper.rkt"`, since the module path given to `defmodule` appears verbatim in the generated documentation.
- Use `defproc` to document the procedure.

Adding these pieces to `"manual.scrbl"` gives us the following:

```
#lang scribble/manual
@(require (for-label racket
                     "helper.rkt"))

@title{My Library}

@defmodule[my-lib/helper]

@defproc[(my-helper [lst list?])
         (listof
          (not/c (one-of/c 'cow)))]{

 Replaces each @racket['cow] in @racket[lst] with
 @racket['aardvark].}
```

In `defproc`, a contract is specified with each argument to the procedure. In this example, the contract for the *`lst`* argument is `list?`, which is the contract for a list. After the closing parenthesis that ends the argument sequence, the contract of the result must be given; in this case, `my-helper` guarantees a result that is a list where none of the elements are `'cow`.

Some things to notice in this example and the documentation that it generates:

- The `list?`, `listof`, etc. elements of contracts are hyperlinked to their documentation.
- The result contract is formatted in the generated documentation in the same way as in the source. That is, the source layout of contracts is preserved. (In this case, putting the contract all on one line would be better.)
- In the prose that documents `my-helper`, *`lst`* is automatically typeset in italic, matching the typesetting in the blue box. The `racket` form essentially knows that it's used in the scope of a procedure with argument *`lst`*.
- If you hover the mouse pointer over `my-helper`, a popup reports that it is provided from `my-lib/helper`.
- If you use `my-helper` in any documentation now, as long as that documentation source also has a `(require (for-label ....))` of `"helper.rkt"`, then the reference is hyperlinked to the definition above.

See `defproc*`, `defform`, etc. for more information on forms to document Racket bindings.

4.1.5 Showing Racket Examples

The `examples` form from `scribble/eval` helps you generate examples in your documentation. To use `examples`, the procedures to document must be suitable for use at docu-

mentation time, but the examples form does not use any binding introduced into the document source by require. Instead, create a new evaluator with its own namespace using make-base-eval, and use interaction-eval to require "helper.rkt" in that evaluator. Finally, supply the same evaluator to examples:

```
#lang scribble/manual
@(require scribble/eval
          (for-label racket
                     "helper.rkt"))

@title{My Library}

@defmodule[my-lib/helper]

@defproc[(my-helper [lst list?])
         (listof
          (not/c (one-of/c 'cow)))]{
 Replaces each @racket['cow] in @racket[lst] with
 @racket['aardvark].

 @(define helper-eval (make-base-eval))
 @interaction-eval[#:eval helper-eval
                   (require "helper.rkt")]
 @examples[
     #:eval helper-eval
     (my-helper '())
     (my-helper '(cows such remarkable cows))
   ]}
```

4.1.6 Multi-Page Sections

Setting the 'multi-page option (see §4.1.3 “Section Hyperlinks”) causes each top-level section of a document to be rendered as a separate HTML page.

To push sub-sections onto separate pages, use the 'toc style for the enclosing section (as started by title, section, subsection, etc.) and use local-table-of-contents to generate hyperlinks to the sub-sections.

Revising "cows.scrbl" from the previous section:

```
#lang scribble/manual

@title[#:style '(toc)]{Cows}

@local-table-of-contents[]
```

```
@section[#:tag "singing"]{Singing}
Wherever they go, it's a quite a show.

@section{Dancing}
See @secref["singing"].
```

To run this example, remember to change "info.rkt" to add the 'multi-page style. You may also want to add a call to table-of-contents in "manual.scrbl".

The difference between table-of-contents and local-table-of-contents is that the latter is ignored for Latex output.

When using local-table-of-contents, it often makes sense to include introductory text before the call of local-table-of-contents. When the introductory text is less important and when local table of contents is short, putting the introductory text after the call of local-table-of-contents may be appropriate.

4.2 Manual Forms

#lang scribble/manual package: scribble-lib

The scribble/manual language provides all of scribble/base plus many additional functions that are specific to writing Racket documentation. It also associates style properties with the generated doc export to select the default Racket manual style for rendering; see §4.2.14 "Manual Rendering Style" for more information.

The scribble/manual name can also be used as a library with require, in which case it provides all of the same bindings, but without setting the reader or setting the default rendering format to the Racket manual format.

4.2.1 Typesetting Code

The codeblock and code forms (see §4.2.1.1 "#lang-Specified Code") typeset code verbatim, adding a layer of color to the code based on the same syntax-coloring parsers that are used by DrRacket. Input that is parsed as an identifier is further given a lexical context and hyperlinked via for-label imports.

The racketblock and racket forms (see §4.2.1.2 "Racket Code") typeset S-expression code roughly verbatim, but roughly by quoting the source term with syntax. Identifiers in the quoted S-expression are hyperlinked via for-label imports.

The two different approaches to typesetting code—codeblock and code versus racketblock and racket—have different advantages and disadvantages:

- The `codeblock` and `code` forms work with non-S-expression syntax, and they give authors more control over output (e.g., the literal number `2/4` is not normalized to `1/2`). The `codeblock` and `code` forms do not yet support escapes to Scribble element mode, and they cannot adapt spacing based on the width of elements in escapes.
- The `racketblock` and `racket` forms are more efficient and allow escapes to Scribble element mode. The `racketblock` and `racket` forms are tied to S-expression syntax, however, and they are based on a syntax representation that tends to normalize source terms (e.g., the literal number `2/4` is normalized to `1/2`).

`#lang`-Specified Code

```
(codeblock option ... str-expr ...+)

option = #:keep-lang-line? keep-expr
       | #:indent indent-expr
       | #:expand expand-expr
       | #:context context-expr
       | #:line-numbers line-number-expr
       | #:line-number-sep line-number-sep-expr

  keep-expr : any/c
  indent-expr : exact-nonnegative-integer?
  expand-expr : (or/c #f (syntax? . -> . syntax?))
  context-expr : (or/c #f syntax?)
  line-number-expr : (or/c #f exact-nonnegative-integer?)
  line-number-sep-expr : exact-nonnegative-integer?
```

Parses the code formed by the strings produced by the *str-expr*s as a Racket module (roughly) and produces a block that typesets the code inset via `nested` with the style `'code-inset`. See also `typeset-code`.

The *str-expr*s should normally start with `#lang` to determine the reader syntax for the module, but the resulting "module" need not expand or compile—except as needed by *expand-expr*. If *expand-expr* is omitted or produces false, then the input formed by *str-expr* is read until an end-of-file is encountered, otherwise a single form is read from the input.

When *keep-expr* produces a true value (the default), the first line in the input (which is typically `#lang`) is preserved in the typeset output, otherwise the first line is dropped. The typeset code is indented by the amount specified by *indent-expr*, which defaults to `0`.

When *expand-expr* produces `#f` (which is the default), identifiers in the typeset code are colored and linked based on for-label bindings in the lexical environment of the syntax object provided by *context-expr*. The default *context-expr* has the same lexical context

as the first *str-expr*. When *line-number-expr* is true, line number is enabled starting from *line-number-expr*, and *line-number-sep-expr* controls the separation (in spaces; defaults to 1) between the line numbers and code.

When *expand-expr* produces a procedure, it is used to macro-expand the parsed program, and syntax coloring is based on the parsed program.

For example,

```
@codeblock|{
  #lang scribble/manual
  @codeblock{
    #lang scribble/manual
    @title{Hello}
  }
}|
```

produces the typeset result

```
#lang scribble/manual
@codeblock{
  #lang scribble/manual
  @title{Hello}
}
```

```
(codeblock0 option ... str-expr ...+)
```

Like `codeblock`, but without the `'code-inset` `nested` wrapper.

```
(code option ... str-expr ...+)

option = #:lang lang-line-expr
       | #:expand expand-expr
       | #:context context-expr

  lang-line-expr : (or/c #f string?)
  expand-expr : (or/c #f (syntax? . -> . syntax?))
  context-expr : (or/c #f syntax?)
```

Like `codeblock`, but produces content instead of a block. No `#lang` line should appear in the string content; instead, it should be provided `#:lang` (as a string without `"#lang "`) if needed, and the `#lang` line is always stripped from the output when provided. Also, each newline in *str-expr*s is collapsed along with all surrounding whitespace to a single space.

For example,

```
This is @code[#:lang "at-exp racket"]|{@bold{Hi}}|'s result:
@bold{Hi}.
```

produces the typeset result

This is `@bold{Hi}`'s result: **Hi**.

```
(typeset-code [#:context context
               #:expand expand
               #:indent indent
               #:keep-lang-line? keep?
               #:line-numbers line-numbers
               #:line-number-sep line-number-sep
               #:block? return-block?]
               strs ...)
 → (if return-block? block? element?)
  context : (or/c #f syntax?) = #f
  expand : (or/c #f (syntax? . -> . syntax?)) = #f
  indent : exact-nonnegative-integer? = 2
  keep? : any/c = #t
  line-numbers : (or/c #f exact-nonnegative-integer?) = #f
  line-number-sep : exact-nonnegative-integer? = 1
  return-block? : any/c = #t
  strs : string?
```

A function-based version of `codeblock`, allowing you to compute the *strs* arguments.

Unlike `codeblock`, the default *context* argument (`#f`) implies that the context is untouched and the *return-block?* argument determines the result structure. The other arguments are treated the same way as `codeblock`.

Racket Code

```
(racketblock maybe-escape datum ...)

maybe-escape =
             | #:escape escape-id
```

Typesets the *datum* sequence as a table of Racket code inset via `nested` with the style `'code-inset`. The source locations of the *datum*s determine the generated layout. For example,

```
(racketblock
 (define (loop x)
   (loop (not x))))
```

produces the output

```
(define (loop x)
  (loop (not x)))
```

with the `(loop (not x))` indented under `define`, because that's the way it is idented the use of `racketblock`. Source-location span information is used to preserve `#true` versus `#t` and `#false` versus `#f`; span information is also used heuristically to add `#i` to the start of an inexact number if its printed form would otherwise be two characters shorter than the source; syntax-object properties are used to preserve square brackets and curly braces versus parentheses; otherwise, using syntax objects tends to normalize the form of S-expression elements, such as rendering `2/4` as `1/2`. When source-location information is not available, such as when it is lost by bytecode-compiled macros, spacing is inserted in the same style (within a single line) as the `racket` form.

See also `quote-syntax/keep-srcloc` for use in a macro to preserve source-location information in a template.

In the above example, `define` is typeset as a keyword (in black) and as a hyperlink to `define`'s definition in the reference manual, because this document was built using a `for-label` binding of `define` (in the source) that matches a definition in the reference manual. Similarly, `not` is a hyperlink to its definition in the reference manual.

Like other forms defined via `define-code`, `racketblock` expands identifiers that are bound as element transformers. Also, since `racketblock` uses `to-paragraph`, the `'display-string` syntax property on any form can supply a string for the typeset version of the form.

An `#:escape` clause specifies an identifier to escape back to an expression that produces an `element`. By default, the escape identifier is `unsyntax`. For example,

```
(racketblock
  (+ 1 #,(elem (racket x) (subscript "2"))))
```

produces

```
(+ 1 x2)
```

The *escape-id* that defaults to `unsyntax` is recognized via `free-identifier=?`, so a binding can hide the escape behavior:

```
(racketblock
  (let ([unsyntax #f])
    (racketblock
      #'(+ 1 #,x))))
```

The `RACKETBLOCK` form's default escape is `UNSYNTAX` instead of `unsyntax`.

A few other escapes are recognized symbolically:

- `(code:line datum ...)` typesets as the sequence of *datum*s (i.e., without the `code:line` wrapper).
- `(code:comment content)` typesets like *content*, but colored as a comment and prefixed with a semi-colon. A typical *content* escapes from Racket-typesetting mode using `unsyntax` and produces a string, an element using `elem`, or a paragraph using `t`:

  ```
  (code:comment @#,elem{this is a comment})
  ```

  (Note that `@#,foo{...}` reads as `#,(foo "...")`.)
- `(code:comment2 content)` is like code:`comment`, but uses two semi-colons to prefix the comment.
- `(code:comment# content)` is like code:`comment`, but uses #; to prefix the comment.
- `(code:contract datum ...)` typesets like the sequence of *datum*s (including its coloring), but prefixed with a semi-colon.
- `(code:contract# datum)` is like `code:contract`, but uses #; to prefix the contract.
- `code:blank` typesets as a blank space.
- `(code:hilite datum)` typesets like *datum*, but with a background highlight.
- `(code:quote datum)` typesets like `(quote datum)`, but without rendering the `quote` as `'`.
- *_id* typesets as `id`, but colored as a variable (like `racketvarfont`); this escape applies only if *_id* has no for-label binding and is not specifically colored as a subform non-terminal via `defform`, a variable via `defproc`, etc.

See also `scribble/comment-reader`.

Changed in version 1.9 of package `scribble-lib`: Added heuristic for adding `#i` to inexact numbers.

`(RACKETBLOCK maybe-escape datum ...)`

Like `racketblock`, but with the default expression escape `UNSYNTAX` instead of `unsyntax`.

`(racketblock0 maybe-escape datum ...)`

Like `racketblock`, but without insetting the code via `nested`.

`(RACKETBLOCK0 maybe-escape datum ...)`

Like `RACKETBLOCK`, but without insetting the code via `nested`.

```
(racketresultblock maybe-escape datum ...)
(racketresultblock0 maybe-escape datum ...)
(RACKETRESULTBLOCK maybe-escape datum ...)
(RACKETRESULTBLOCK0 maybe-escape datum ...)
```

Like `racketblock`, etc., but colors the typeset text as a result (i.e., a single color with no hyperlinks) instead of code.

Unlike `racketblock`, `racketresultblock` and `RACKETRESULTBLOCK` implement indentation by adding an `(hspace 2)` to the start of each line, instead of using `nested` with the `'code-inset` style. To get formatting more like `racketblock` and `racketinput`, use `(nested #:style 'code-inset (racketresultblock0 datum ...))` instead of `(racketresultblock datum ...)`.

```
(racketinput maybe-escape datum ...)
(RACKETINPUT maybe-escape datum ...)
```

Like `racketblock` and `RACKETBLOCK`, but the *datum*s are typeset after a prompt representing a REPL.

```
(racketinput0 maybe-escape datum ...)
(RACKETINPUT0 maybe-escape datum ...)
```

Like `racketinput` and `RACKETINPUT`, but without insetting the code via `nested`.

```
(racketmod maybe-file maybe-escape lang datum ...)

  maybe-file =
             | #:file filename-expr

maybe-escape =
             | #:escape escape-id
```

Like `racketblock`, but the *datum* are typeset inside a `#lang`-form module whose language is *lang*.

The source location of *lang* (relative to the body *datum*s) determines the relative positioning of the `#lang` line in the typeset output. So, line up *lang* with the left end of the content code.

If `#:file` is provided, then the code block is typeset using `filebox` with *filename-expr* as the filename argument.

```
(racketmod0 maybe-file maybe-escape lang datum ...)
```

Like `racketmod`, but without insetting the code via `nested`.

```
(racket maybe-escape datum ...)
```

Like `racketblock`, but typeset on a single line and wrapped with its enclosing paragraph, independent of the formatting of *datum*.

```
(RACKET maybe-escape datum ...)
```

Like `racket`, but with the `UNSYNTAX` escape like `racketblock`.

```
(racketresult maybe-escape datum ...)
```

Like `racket`, but typeset as a result (i.e., a single color with no hyperlinks).

```
(racketid maybe-escape datum ...)
```

Like `racket`, but typeset as an unbound identifier (i.e., no coloring or hyperlinks).

```
(schemeblock maybe-escape datum ...)
(SCHEMEBLOCK maybe-escape datum ...)
(schemeblock0 maybe-escape datum ...)
(SCHEMEBLOCK0 maybe-escape datum ...)
(schemeinput maybe-escape datum ...)
(schememod lang maybe-escape datum ...)
(scheme maybe-escape datum ...)
(SCHEME maybe-escape datum ...)
(schemeresult maybe-escape datum ...)
(schemeid maybe-escape datum ...)
```

Compatibility aliases. Each `scheme...` name is an alias for the corresponding `racket...` binding.

Preserving Comments

`#reader scribble/comment-reader` package: `scribble-lib`

As a reader module, `scribble/comment-reader` reads a single S-expression that contains `;`-based comment lines, and it wraps the comments with `code:comment` for use with forms like `racketblock`. More precisely, `scribble/comment-reader` extends the current reader to adjust the parsing of `;`.

For example, within a Scribble document that imports `scribble/manual`,

```
@#reader scribble/comment-reader
```

```
(racketblock
 ;; This is not a pipe
 (make-pipe)
)
```

generates

```
; This is not a pipe
(make-pipe)
```

The initial `@` is needed above to shift into S-expression mode, so that `#reader` is recognized as a reader declaration instead of literal text. Also, the example uses `(racketblock ....)` instead of `@racketblock[....]` because the @-reader would drop comments within the `racketblock` before giving `scribble/comment-reader` a chance to convert them.

The implementation of `scribble/comment-reader` uses `unsyntax` to typeset comments. When using `scribble/comment-reader` with, for instance, `RACKETBLOCK`, `unsyntax` does not escape, since `RACKETBLOCK` uses `UNSYNTAX` as its escape form. You can declare an escape identifier for `scribble/comment-reader` with `#:escape-id`. For example,

```
@#reader scribble/comment-reader #:escape-id UNSYNTAX
 (RACKETBLOCK
   (define-syntax (m stx)
     (syntax-case stx ()
       [(_ x)
        ;; Well this was silly
        #`(#,x)])))
)
```

generates

```
(define-syntax (m stx)
  (syntax-case stx ()
    [(_ x)
     ; Well this was silly
     #`(#,x)]))
```

Code Fonts and Styles

```
(racketmodname datum maybe-indirect)
(racketmodname (unsyntax expr) maybe-indirect)

maybe-indirect =
               | #:indirect
```

Like `racket`, but typeset as a module path and without special treatment of identifiers (such

as code:blank or identifiers that start with _). If *datum* is an identifier or *expr* produces a symbol, then it is hyperlinked to the module path's definition as created by defmodule.

If #:indirect is specified, then the hyperlink is given the 'indirect-link style property, which makes the hyperlink's resolution in HTML potentially delayed; see 'indirect-link for link-element.

Changed in version 1.21 of package scribble-lib: Disabled racket-style special treatment of identifiers.

```
(racketmodlink datum maybe-indirect pre-content-expr ...)

maybe-indirect =
               | #:indirect
```

Like racketmodname, but separating the module path to link from the content to be linked. The *datum* module path is always linked, even if it is not an identifier.

Changed in version 1.59 of package scribble-lib: Added support for #:indirect.

```
(litchar str ...) → element?
  str : string?
```

Typesets *str*s as a representation of literal text. Use this when you have to talk about the individual characters in a stream of text, as when documenting a reader extension.

```
(racketfont pre-content ...) → element?
  pre-content : pre-content?
```

The same as (tt *pre-content* ...), which applies the 'tt style to immediate strings and symbols among the *pre-content* arguments. Beware that *pre-content* is decoded as usual, making racketfont a poor choice for typesetting literal code.

```
(racketplainfont pre-content ...) → element?
  pre-content : pre-content?
```

Applies the 'tt style to *pre-content*. Beware that *pre-content* is decoded as usual, making racketplainfont a poor choice for typesetting literal code directly but useful for implementing code-formatting functions.

Added in version 1.6 of package scribble-lib.

```
(racketvalfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as a value.

```
(racketresultfont [#:decode? decode?]
                  pre-content ...)  → element?
  decode? : boolean? = #t
  pre-content : pre-content?
```

Like racketplainfont, but colored as a REPL result. When *decode?* is #f, then unlike racketplainfont, racketresultfont avoids decodeing its argument.

```
(racketidfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as an identifier.

```
(racketvarfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as a variable (i.e., an argument or sub-form in a procedure being documented).

```
(racketkeywordfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as a syntactic form name.

```
(racketparenfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored like parentheses.

```
(racketoptionalfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as optional.

Added in version 1.36 of package scribble-lib.

```
(racketmetafont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as meta-syntax, such as backquote or unquote.

```
(racketcommentfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as a comment.

```
(racketerror pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as error-message text.

```
(racketmodfont pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as module name.

```
(racketoutput pre-content ...) → element?
  pre-content : pre-content?
```

Like racketplainfont, but colored as output.

```
(procedure pre-content ...) → element?
  pre-content : pre-content?
```

Typesets decoded *pre-content* as a procedure name in a REPL result (e.g., in typewriter font with a `#<procedure:` prefix and `>` suffix.).

```
(var datum)
```

Typesets *datum* as an identifier that is an argument or sub-form in a procedure being documented. Normally, the `defproc` and `defform` arrange for `racket` to format such identifiers automatically in the description of the procedure, but use `var` if that cannot work for some reason.

```
(svar datum)
```

Like `var`, but for subform non-terminals in a form definition.

```
(schememodname datum)
(schememodname (unsyntax expr))
(schememodlink datum pre-content-expr ...)
(schemefont pre-content ...) → element?
  pre-content : pre-content?
(schemevalfont pre-content ...) → element?
  pre-content : pre-content?
(schemeresultfont pre-content ...) → element?
  pre-content : pre-content?
(schemeidfont pre-content ...) → element?
  pre-content : pre-content?
```

```
(schemevarfont pre-content ...) → element?
  pre-content : pre-content?
(schemekeywordfont pre-content ...) → element?
  pre-content : pre-content?
(schemeparenfont pre-content ...) → element?
  pre-content : pre-content?
(schemeoptionalfont pre-content ...) → element?
  pre-content : pre-content?
(schememetafont pre-content ...) → element?
  pre-content : pre-content?
(schemeerror pre-content ...) → element?
  pre-content : pre-content?
(schememodfont pre-content ...) → element?
  pre-content : pre-content?
(schemeoutput pre-content ...) → element?
  pre-content : pre-content?
```

Compatibility aliases. Each `scheme...` name is an alias for the corresponding `racket...` binding.

4.2.2 Documenting Modules

```
(defmodule maybe-req one-or-multi option ... pre-flow ...)

   maybe-req =
             | #:require-form content-or-proc-expr

one-or-multi = module-spec
             | #:multi (module-spec ...+)

 module-spec = module-path
             | content-expr

      option = #:module-paths (module-path ...)
             | #:no-declare
             | #:use-sources (src-module-path ...)
             | #:link-target? link-target?-expr
             | #:indirect
             | #:lang
             | #:reader
             | #:packages (pkg-expr ...)
             | #:language-family (family-string ...)
```

Produces a sequence of flow elements (in a `splice`) to start the documentation for a

module—or for multiple modules, if the #:multi form is used.

Each documented module specified as either a *module-path* (in the sense of require), in which case the module path is typeset using racketmodname, or by a *content-expr*. The latter case is triggered by the presence of a #:module-paths clause, which provides a plain *module-path* for each *module-spec*, and the plain *module-path* is used for cross-referencing.

If a #:require-form clause is provided and if #:lang and #:reader are not provided, the given expression produces either content to use instead of require for the declaration of the module, or a procedure that takes the typeset module name as an element and returns an element to use for the require form. The #:require-form clause is useful to suggest a different way of accessing the module instead of through require.

Besides generating text, unless #:no-declare appears as an option, this form expands to a use of declare-exporting with *module-path*s; the #:use-sources clause, if provided, is propagated to declare-exporting. Consequently, defmodule should be used at most once in a section without #:no-declare, though it can be shadowed with defmodules in sub-sections. Use #:no-declare form when you want to provide a more specific list of modules (e.g., to name both a specific module and one that combines several modules) via your own declare-exporting declaration

When #:link-target? is omitted or specified with an expression that produces a true value, then the *module-path*s are also declared as link targets though a part-tag-decl (which means that the defmodule form must appear before any sub-parts). These link targets are referenced via racketmodname, which thus points to the enclosing section, rather than the individual *module-path*s.

Specifying #:indirect normally makes sense only when #:link-target? is specified with a #f value. Specifying #:indirect makes the module path that is displayed (and that normally refers to some other declaration of the module) use racketmodname with #:indirect.

If #:lang is provided as an option, then the module name is shown after #lang (instead of in a require form) to indicate that the *module-path*s are suitable for use by either require or #lang. If the module path for require is syntactically different from the #lang form, use #:module-paths to provide the require variant (and make each *module-spec* a *content-expr*).

If #:reader is provided, then the module name is shown after #reader to indicate that the module path is intended for use as a reader module.

By default, the package (if any) that supplies the documented module is determined automatically, but a set of providing packages can be specified explicitly with #:packages. Each *pkg-expr* result is passed on to a function like tt for typesetting. Provide an empty sequence after #:packages to suppress any package name in the output. Each *pkg-expr* expression is duplicated for a declare-exporting form, unless #:no-declare is speci-

fied.

If #:language-family is provided, then it specifies language-family names for this module, which affects the way that the module name is searched and shown in the documentation index. See also index-desc.

Each *option* form can appear at most once, and #:lang and #:reader are mutually exclusive.

The decoded *pre-flow*s introduce the module, but need not include all of the module content.

Changed in version 1.43 of package scribble-lib: Supported a procedure value for #:require-form.
Changed in version 1.54: Added the #:language-family option.

```
(declare-exporting module-path/escape ... maybe-pkgs maybe-sources)

        maybe-pkgs =
                   | #:packages (pkg-expr ...)

     maybe-sources =
                   | #:use-sources (module-path/escape ...)

module-path/escape = module-path
                   | ,module-path-expr
```

Associates the *module-path*s to all bindings defined within the enclosing section, except as overridden by other declare-exporting declarations in nested sub-sections. The list of *module-path*s before #:use-sources is shown, for example, when the user hovers the mouse over one of the bindings defined within the section. A unquote-escaped ,*module-path-expr* can be used in place of a *module-path* to compute the module path dynamically.

More significantly, the first *module-path* before #:use-sources plus the *module-path*s after #:use-sources determine the binding that is documented by each defform, defproc, or similar form within the section that contains the declare-exporting declaration:

- If no #:use-sources clause is supplied, then the documentation applies to the given name as exported by the first *module-path*.
- If #:use-sources *module-path*s are supplied, then they are tried in order before the first *module-path*. The *module-path* that provides an export with the same symbolic name and free-label-identifier=? to the given name is used as the documented binding. This binding is assumed to be the same as the identifier as exported by the first *module-path* in the declare-exporting declaration.

Use #:use-sources sparingly, but it is needed when

- bindings are documented as originating from a module *M*, but the bindings are actually re-exported from some module *P*; and
- other documented modules also re-export the bindings from *P*, but they are documented as re-exporting from *M*.

For example, the `parameterize` binding of `mzscheme` is documented as re-exported from `racket/base`, but `parameterize` happens to be implemented in a private module and re-exported by both `racket/base` and `mzscheme`. Importing `parameterize` from `mzscheme` does not go through `racket/base`, so a search for documentation on `parameterize` in `mzscheme` would not automatically connect to the documentation of `racket/base`. To make the connection, the documentation of `racket/base` declares the private module to be a source through `#:use-sources`, so that any re-export of `parameterize` from the private module connects to the documentation for `racket/base` (unless a re-export has its own documentation, which would override the automatic connection when searching for documentation).

The initial *module-path*s sequence can be empty if *module-path*s are given with `#:use-sources`. In that case, the rendered documentation never reports an exporting module for identifiers that are documented within the section, but the *module-path*s in `#:use-sources` provide a binding context for connecting (via hyperlinks) definitions and uses of identifiers.

Supply `#:packages` to specify the package that provides the declared modules, which is otherwise inferred automatically from the first *module-path*. The package names are used, for example, by `history`.

The `declare-exporting` form should be used no more than once per section, since the declaration applies to the entire section, although overriding `declare-exporting` forms can appear in sub-sections.

Changed in version 1.1 of package `scribble-lib`: Added `#:packages` clause.
Changed in version 1.17: Added support for `,`*module-path-expr*.

```
(defmodulelang one-or-multi maybe-sources option ... pre-flow ...)
(defmodulelang one-or-multi #:module-path module-path
               option ... pre-flow ...)
```

Equivalent to `defmodule` with `#:lang`. The `#:module-path` *module-path* is provided, it is converted to `#:module-paths (`*module-path*`)`.

```
(defmodulereader one-or-multi option ... pre-flow ...)
```

Equivalent to `defmodule` with `#:reader`.

```
(defmodule* maybe-req (module-spec ...+) option ... pre-flow ...)
(defmodulelang* (module-spec ...+) option ... pre-flow ...)
(defmodulereader* (module-spec ...+) option ... pre-flow ...)
```

Equivalent to `defmodule` variants with `#:multi`.

```
(defmodule*/no-declare maybe-req (module-spec ...) option ... pre-
flow ...)
(defmodulelang*/no-declare (module-spec ...) option ... pre-flow ...)
(defmodulereader*/no-declare (module-spec ...) option ... pre-
flow ...)
```

Equivalent to `defmodule` variants `#:no-declare`.

4.2.3 Documenting Forms, Functions, Structure Types, and Values

```
(defproc options prototype
         result-contract-expr-datum
         maybe-value
         pre-flow ...)

  prototype = (id arg-spec ...)
            | (prototype arg-spec ...)

   arg-spec = (arg-id contract-expr-datum)
            | (arg-id contract-expr-datum default-expr)
            | (keyword arg-id contract-expr-datum)
            | (keyword arg-id contract-expr-datum default-expr)
            | ellipses
            | ellipses+

    options = maybe-kind maybe-link maybe-id

 maybe-kind =
            | #:kind kind-content-expr

 maybe-link =
            | #:link-target? link-target?-expr

   maybe-id =
            | #:id [src-id dest-id-expr]

maybe-value =
            | #:value value-expr-datum

   ellipses = ...

  ellipses+ = ...+
```

Produces a sequence of flow elements (encapsulated in a `splice`) to document a procedure named *id*. Nesting *prototype*s corresponds to a curried function, as in `define`. Unless *link-target?-expr* is specified and produces `#f`, the *id* is indexed, and it also registered so that `racket`-typeset uses of the identifier (with the same for-label binding) are hyperlinked to this documentation.

Examples:

```
@defproc[(make-sandwich [ingredients (listof ingredient?)])
         sandwich?]{
  Returns a sandwich given the right ingredients.
}

@defproc[#:kind "sandwich-maker"
         (make-reuben [ingredient sauerkraut?] ...
                      [#:veggie? veggie? any/c #f])
         sandwich?]{
  Produces a reuben given some number of @racket[ingredient]s.

  If @racket[veggie?] is @racket[#f], produces a standard
  reuben with corned beef. Otherwise, produces a vegetable
  reuben.
}
```

Renders like:

```
(make-sandwich ingredients) → sandwich?
  ingredients : (listof ingredient?)
```

Returns a sandwich given the right ingredients.

```
(make-reuben  ingredient
              ...
             [#:veggie? veggie?]) → sandwich?
  ingredient : sauerkraut?
  veggie? : any/c = #f
```

Produces a reuben given some number of *ingredient*s.
If *veggie?* is `#f`, produces a standard reuben with corned beef. Otherwise, produces a vegetable reuben.

When *id* is indexed and registered, a `defmodule` or `declare-exporting` form (or one of the variants) in an enclosing section determines the *id* binding that is being defined. The *id* should also have a for-label binding (as introduced by `(require (for-label ....))`) that matches the definition binding; otherwise, the defined *id* will not typeset correctly within the definition.

Each *arg-spec* must have one of the following forms:

`(`*arg-id contract-expr-datum*`)`

An argument whose contract is specified by *contract-expr-datum* which is typeset via `racketblock0`.

`(`*arg-id contract-expr-datum default-expr*`)`

Like the previous case, but with a default value. All arguments with a default value must be grouped together, but they can be in the middle of required arguments.

`(`*keyword arg-id contract-expr-datum*`)`

Like the first case, but for a keyword-based argument.

`(`*keyword arg-id contract-expr-datum default-expr*`)`

Like the previous case, but with a default value.

`...`

Any number of the preceding argument. This form is normally used at the end, but keyword-based arguments can sensibly appear afterward. See also the documentation for `append` for a use of `...` before the last argument.

`...+`

One or more of the preceding argument (normally at the end, like `...`).

The *result-contract-expr-datum* is typeset via `racketblock0`, and it represents a contract on the procedure's result.

The decoded *pre-flow* documents the procedure. In this description, references to *arg-id*s using `racket`, `racketblock`, etc. are typeset as procedure arguments.

The typesetting of all information before the *pre-flow*s ignores the source layout, except that the local formatting is preserved for contracts and default-values expressions. The information is formatted to fit (if possible) in the number of characters specified by the `current-display-width` parameter.

An optional `#:kind` specification chooses the decorative label, which defaults to `"procedure"`. A `#f` result for *kind-content-expr* uses the default, otherwise *kind-content-expr* should produce content in the sense of `content?`. An alternate label should be all lowercase.

If `#:id [`*src-id dest-id-expr*`]` is supplied, then *src-id* is the identifier as it appears in the *prototype* (to be replaced by a defining instance), and *dest-id-expr* produces the identifier to be documented in place of *src-id*. This split between *src-id* and *dest-id-expr* roles is useful for functional abstraction of `defproc`.

If `#:value` *value-expr-datum* is given, *value-expr-datum* is typeset using `racketblock0` and included in the documentation. As a service to readers, please use `#:value` to document only simple, short functions.

```
(defproc* options
          ([prototype
            result-contract-expr-datum
            maybe-value] ...+)
          pre-flow ...)
```

Like `defproc`, but for multiple cases with the same `id`. Multiple distinct `id`s can also be defined by a single `defproc*`, for the case that it's best to document a related group of procedures at once (but multiple `defproc`s grouped by `deftogether` also works for that case).

When an `id` has multiple calling cases, either they must be defined with a single `defproc*`, so that a single definition point exists for the `id`, or else all but one definition should use `#:link-target? #f`.

Examples:

```
@defproc*[([(make-pb&j) sandwich?]
           [(make-pb&j [jelly jelly?]) sandwich?])]{
  Returns a peanut butter and jelly sandwich. If @racket[jelly]
  is provided, then it is used instead of the standard (grape)
  jelly.
}
```

Renders like:

```
(make-pb&j) → sandwich?
(make-pb&j jelly) → sandwich?
  jelly : jelly?
```

Returns a peanut butter and jelly sandwich. If *jelly* is provided, then it is used instead of the standard (grape) jelly.

```
(defform options form-datum
  maybe-grammar maybe-contracts
  pre-flow ...)

       options = maybe-kind maybe-link maybe-id maybe-literals

    maybe-kind =
               | #:kind kind-content-expr

    maybe-link =
               | #:link-target? link-target?-expr

      maybe-id =
               | #:id id
               | #:id [id id-expr]
               | #:id [(id ...) ids-expr]

 maybe-literals =
               | #:literals (literal-id ...)

  maybe-grammar =
               | #:grammar ([nonterm-id clause-datum ...+] ...)

maybe-contracts =
               | #:contracts ([subform-datum contract-expr-datum]
                              ...)
```

Produces a sequence of flow elements (encapsulated in a `splice`) to document a syntatic form named by *id* (or the result of *id-expr* or *ids-expr*). The documented form's syntax is described by *form-datum*. If no `#:id` is used to specify *id*s, then *form-datum* must have the form `(id . datum)`.

If `#:kind` *kind-content-expr* is supplied, it is used in the same way as for `defproc`, but the default kind is `"syntax"`.

Unless *link-target?-expr* is specified and produces `#f`, the *id* (or result of *id-expr* or *ids-expr*) is indexed, and it is also registered so that `racket`-typeset uses of the identifier (with the same `for-label` binding) are hyperlinked to this documentation. The `defmodule` or `declare-exporting` requirements, as well as the binding requirements for *id* (or result of *id-expr*), are the same as for `defproc`.

If `#:id [`*id id-expr*`]` is supplied, then *id* is the identifier as it appears in the *form-datum*, and *id-expr* produces the identifier to be documented (i.e., one with a `for-label` binding). The *id* in *form-datum* is replaced with a defining typeset form of the identifier from *id-expr*. This split between *id* and *id-expr* roles is useful for functional abstraction

of `defform`. Even more generally, the name to show as defined in *form-datum* can be different than the symbolic part of *id-expr*'s result, because a `'display-string` syntax property can provide alternate text for typesetting; see `racketblock` for more information.

If `#:id [(id ...) ids-expr]` is supplied, then *ids-expr* should produce a list of identifiers, one for each *id* listed. Each *id* is replaced in *form-datum* with the corresponding defining instance from *ids-expr*. At least one of the *id*s must appear in *form-datum*, but they need not all appear; all identifiers listed by *ids-expr* will still be documented and linked to some *id* that does appear (as long as *link-target?-expr* does not produce `#f`).

The decoded *pre-flow* documents the form. In this description, a reference to any identifier in *form-datum* via `racket`, `racketblock`, etc. is typeset as a sub-form non-terminal. If `#:literals` clause is provided, however, instances of the *literal-id*s are typeset normally (i.e., as determined by the enclosing context).

If a `#:grammar` clause is provided, it includes an auxiliary grammar of non-terminals shown with the *id* form. Each *nonterm-id* is specified as being any of the corresponding *clause-datum*s.

If a `#:contracts` clause is provided, each *subform-datum* (typically an identifier that serves as a meta-variable in *form-datum* or *clause-datum*) is shown as producing a value that must satisfy the contract described by *contract-expr-datum*. Use `#:contracts` only to specify constraints on a *value* produced by an expression; for constraints on the *syntax* of a *subform-datum*, use grammar notation instead, possibly through an auxiliary grammar specified with `#:grammar`.

The typesetting of *form-datum*, *clause-datum*, *subform-datum*, and *contract-expr-datum* preserves the source layout, like `racketblock`.

Examples:

```
@defform[(sandwich-promise sandwich-expr)
         #:contracts ([sandwich-expr sandwich?])]{
  Returns a promise to construct a sandwich. When forced, the promise
  will produce the result of @racket[sandwich-expr].
}

@defform[#:literals (sandwich mixins)
         (sandwich-promise* [sandwich sandwich-expr]
                            [mixins ingredient-expr ...])
         #:contracts ([sandwich-expr sandwich?]
                      [ingredient-expr ingredient?])]{
  Returns a promise to construct a sandwich. When forced, the promise
  will produce the result of @racket[sandwich-
expr]. Each result of
  the @racket[ingredient-expr]s will be mixed into the resulting
  sandwich.
```

```
}

@defform[(sandwich-factory maybe-name factory-component ...)
         #:grammar
         [(maybe-name (code:line)
                      name)
          (factory-component (code:line #:protein protein-expr)
                             [vegetable vegetable-expr])]]{
  Constructs a sandwich factory. If @racket[maybe-
name] is provided,
  the factory will be named. Each of the @racket[factory-
component]
  clauses adds an additional ingredient to the sandwich pipeline.
}
```

Renders like:

(sandwich-promise *sandwich-expr*)

sandwich-expr : sandwich?

Returns a promise to construct a sandwich. When forced, the promise will produce the result of *sandwich-expr*.

(sandwich-promise* [sandwich *sandwich-expr*]
[mixins *ingredient-expr* ...])

sandwich-expr : sandwich?

ingredient-expr : ingredient?

Returns a promise to construct a sandwich. When forced, the promise will produce the result of *sandwich-expr*. Each result of the *ingredient-expr*s will be mixed into the resulting sandwich.

(sandwich-factory *maybe-name factory-component ...*)

maybe-name =
| *name*

factory-component = #:protein *protein-expr*
| [*vegetable vegetable-expr*]

Constructs a sandwich factory. If *maybe-name* is provided, the factory will be named. Each of the *factory-component* clauses adds an additional ingredient to the sandwich pipeline.

Changed in version 1.63 of package `scribble-lib`: Added support for multiple *id*s after `#:id`.

```
(defform* options [form-datum ...+]
  maybe-grammar maybe-contracts
  pre-flow ...)
```

Like `defform`, but for multiple forms using the same *id*.

Examples:

```
@defform*[((call-with-current-sandwich expr)
           (call-with-current-sandwich expr sandwich-handler-
expr))]{
  Runs @racket[expr] and passes it the value of the current
  sandwich. If @racket[sandwich-handler-expr] is provided, its result
  is invoked when the current sandwich is eaten.
}
```

Renders like:

```
(call-with-current-sandwich expr)
(call-with-current-sandwich expr sandwich-handler-expr)
```

> Runs *expr* and passes it the value of the current sandwich. If *sandwich-handler-expr* is provided, its result is invoked when the current sandwich is eaten.

```
(defform/none maybe-kind maybe-literal form-datum
  maybe-grammar maybe-contracts
  pre-flow ...)
```

Like `defform` with `#:link-target? #f`.

```
(defidform maybe-kind maybe-link id pre-flow ...)
```

Like `defform`, but with a plain *id* as the form.

```
(defidform/inline id)
(defidform/inline (unsyntax id-expr))
```

Like `defidform`, but *id* (or the result of *id-expr*, analogous to `defform`) is typeset as an inline element. Use this form sparingly, because the typeset form does not stand out to the reader as a specification of *id*.

```
(defsubform options form-datum
   maybe-grammar maybe-contracts
   pre-flow ...)
(defsubform* options [form-datum ...+]
  maybe-grammar maybe-contracts
  pre-flow ...)
```

Like `defform` and `defform*`, but with indenting on the left for both the specification and the *pre-flow*s.

```
(defsubidform id pre-flow ...)
```

Like `defidform`, but with indenting on the left for both the specification and the *pre-flow*s.

Added in version 1.48 of package `scribble-lib`.

```
(specform maybe-literals datum maybe-grammar maybe-contracts
  pre-flow ...)
```

Like `defform` with `#:link-target? #f`, but with indenting on the left for both the specification and the *pre-flow*s.

```
(specsubform maybe-literals datum maybe-grammar maybe-contracts
  pre-flow ...)
```

Similar to `defform` with `#:link-target? #f`, but without the initial identifier as an implicit literal, and the table and flow are typeset indented. This form is intended for use when refining the syntax of a non-terminal used in a `defform` or other `specsubform`. For example, it is used in the documentation for `defproc` in the itemization of possible shapes for *arg-spec*.

The *pre-flow*s list is parsed as a flow that documents the procedure. In this description, a reference to any identifier in *datum* is typeset as a sub-form non-terminal.

```
(specspecsubform maybe-literals datum maybe-grammar maybe-contracts
  pre-flow ...)
```

Like `specsubform`, but indented an extra level. Since using `specsubform` within the body of `specsubform` already nests indentation, `specspecsubform` is for extra indentation without nesting a description.

```
(defform/subs options form-datum
  ([nonterm-id clause-datum ...+] ...)
  maybe-contracts
  pre-flow ...)
```

```
(defform*/subs options [form-datum ...+]
  ([nonterm-id clause-datum ...+] ...)
  maybe-contracts
  pre-flow ...)
(specform/subs maybe-literals datum
  ([nonterm-id clause-datum ...+] ...)
  maybe-contracts
  pre-flow ...)
(specsubform/subs maybe-literals datum
  ([nonterm-id clause-datum ...+] ...)
  maybe-contracts
  pre-flow ...)
(specspecsubform/subs maybe-literals datum
 ([nonterm-id clause-datum ...+] ...)
 maybe-contracts
 pre-flow ...)
```

Like `defform`, `defform*`, `specform`, `specsubform`, and `specspecsubform`, respectively, but the auxiliary grammar is mandatory and the `#:grammar` keyword is omitted.

Examples:

```
@defform/subs[(sandwich-factory maybe-name factory-component ...)
              [(maybe-name (code:line)
                           name)
               (factory-component (code:line #:protein protein-
expr)
                                  [vegetable vegetable-expr])]]{
  Constructs a sandwich factory. If @racket[maybe-
name] is provided,
  the factory will be named. Each of the @racket[factory-
component]
  clauses adds an additional ingredient to the sandwich pipeline.
}
```

Renders like:

```
(sandwich-factory maybe-name factory-component ...)

      maybe-name =
                 | name

factory-component = #:protein protein-expr
                  | [vegetable vegetable-expr]
```

Constructs a sandwich factory. If *maybe-name* is provided, the factory will be named. Each of the *factory-component* clauses adds an additional ingredient to the sandwich pipeline.

```
(defparam maybe-link id arg-id
  contract-expr-datum
  maybe-auto-value
  pre-flow ...)
```

Like `defproc`, but for a parameter. The *contract-expr-datum* serves as both the result contract on the parameter and the contract on values supplied for the parameter. The *arg-id* refers to the parameter argument in the latter case.

Examples:

```
@defparam[current-sandwich sandwich sandwich?
          #:value empty-sandwich]{
  A parameter that defines the current sandwich for operations that
  involve eating a sandwich. Default value is the empty sandwich.
}

@(require (for-label racket/base))

@defparam[current-readtable v any/c #:auto-value]{
  A parameter to hold a readtable.
}
```

Renders like:

```
(current-sandwich) → sandwich?
(current-sandwich sandwich) → void?
  sandwich : sandwich?
 = empty-sandwich
```

A parameter that defines the current sandwich for operations that involve eating a sandwich. Default value is the empty sandwich.

```
(current-readtable) → any/c
(current-readtable v) → void?
  v : any/c
 = #f
```

A parameter to hold a readtable.

Changed in version 1.51 of package `scribble-lib`: Added support for `#:auto-value`.

```
(defparam* maybe-link id arg-id
  in-contract-expr-datum out-contract-expr-datum
  maybe-auto-value
  pre-flow ...)
```

Like `defparam`, but with separate contracts for when the parameter is being set versus when it is being retrieved (for the case that a parameter guard coerces values matching a more flexible contract to a more restrictive one; `current-directory` is an example).

Changed in version 1.51 of package `scribble-lib`: Added support for `#:auto-value`.

```
(defboolparam maybe-link id arg-id
  maybe-auto-value
  pre-flow ...)
```

Like `defparam`, but the contract on a parameter argument is `any/c`, and the contract on the parameter result is `boolean?`.

Changed in version 1.51 of package `scribble-lib`: Added support for `#:auto-value`.

```
(defthing options id contract-expr-datum maybe-auto-value
  pre-flow ...)

        options = maybe-kind maybe-link maybe-id

     maybe-kind =
                | #:kind kind-content-expr

     maybe-link =
                | #:link-target? link-target?-expr

       maybe-id =
                | #:id id-expr

maybe-auto-value =
                | #:value value-expr-datum
                | #:auto-value
```

Like `defproc`, but for a non-procedure binding.

If `#:kind kind-content-expr` is supplied, it is used in the same way as for `defproc`, but the default kind is `"value"`.

If `#:id id-expr` is supplied, then the result of *id-expr* is used in place of *id*.

If `#:value` *value-expr-datum* is given, *value-expr-datum* is typeset using `racketblock0` and included in the documentation. Wide values are put on a separate line.

The option `#:auto-value` is the same as `#:value` *value-expr-datum* where *value-expr-datum* is automatically queried from the for-label binding. `#:auto-value` can only be used when the value is marshalable (e.g., if the value is a struct, it must be a prefab struct of marshalable values).

Examples:

```
@defthing[moldy-sandwich sandwich?]{
  Don't eat this. Provided for backwards compatibility.
}

@defthing[empty-sandwich sandwich? #:value (make-sandwich empty)]{
  The empty sandwich.
}

@(require (for-label racket/list))

@defthing[empty any/c #:auto-value]{
  The empty list.
}
```

Renders like:

`moldy-sandwich : sandwich?`

Don't eat this. Provided for backwards compatibility.

`empty-sandwich : sandwich? = (make-sandwich empty)`

The empty sandwich.

`empty : any/c = '()`

The empty list.

Changed in version 1.51 of package `scribble-lib`: Added support for `#:auto-value`.

```
(defthing* options ([id contract-expr-datum maybe-auto-value] ...+)
  pre-flow ...)
```

Like `defthing`, but for multiple non-procedure bindings. Unlike `defthing`, *id-expr* is not supported.

Examples:

```
@defthing*[([moldy-sandwich sandwich?]
            [empty-sandwich sandwich?])]{
  Predefined sandwiches.
}
```

Renders like:

```
moldy-sandwich : sandwich?
empty-sandwich : sandwich?
```

Predefined sandwiches.

Changed in version 1.51 of package `scribble-lib`: Added support for `#:auto-value`.

```
(defstruct* maybe-link struct-name ([field contract-expr-datum] ...)
  maybe-mutable maybe-non-opaque maybe-constructor
  pre-flow ...)
(defstruct maybe-link struct-name ([field contract-expr-datum] ...)
  maybe-mutable maybe-non-opaque maybe-constructor
  pre-flow ...)

      maybe-link =
                 | #:link-target? link-target?-expr

     struct-name = id
                 | (id super-id)

           field = field-id
                 | (field-id field-option ...)

    field-option = #:mutable
                 | #:auto

   maybe-mutable =
                 | #:mutable

maybe-non-opaque =
                 | #:prefab
                 | #:transparent
                 | #:inspector #f

maybe-constructor =
                 | #:constructor-name constructor-id
                 | #:extra-constructor-name constructor-id
                 | #:omit-constructor
```

Similar to `defform` or `defproc`, but for a structure definition. The `defstruct*` form corresponds to `struct`, while `defstruct` corresponds to `define-struct`.

Examples:

An example using `defstruct`:

```
@defstruct[sandwich ([(protein #:mutable) ingredient?] [sauce ingredient?])]{
  A structure type for sandwiches. Sandwiches are a pan-
human foodstuff
  composed of a partially-enclosing bread material and various
  ingredients. The @racketid[protein] field is mutable.
}
```

Renders like:

```
(struct sandwich ([protein #:mutable] sauce)
    #:extra-constructor-name make-sandwich)
  protein : ingredient?
  sauce : ingredient?
```

> A structure type for sandwiches. Sandwiches are a pan-human foodstuff composed of a partially-enclosing bread material and various ingredients. The `protein` field is mutable.

Additionally, an example using `defstruct*`:

```
@defstruct*[burrito ([salsa ingredient?] [tortilla ingredient?])]{
  A structure type for burritos. Burritos are a pan-
human foodstuff
  composed of a @emph{fully}-encolosed bread material and various
  ingredients.
}
```

Renders like:

```
(struct burrito (salsa tortilla))
  salsa : ingredient?
  tortilla : ingredient?
```

> A structure type for burritos. Burritos are a pan-human foodstuff composed of a *fully*-encolosed bread material and various ingredients.

```
(deftogether [def-expr ...+] pre-flow ...)
```

Combines the definitions created by the *def-expr*s into a single definition box. Each *def-expr* should produce a definition point via `defproc`, `defform`, etc. Each *def-expr* should have an empty *pre-flow*; the decoded *pre-flow* sequence for the `deftogether` form documents the collected bindings.

Examples:

```
@deftogether[(@defthing[test-sandwich-1 sandwich?]
              @defthing[test-sandwich-2 sandwich?])]{
  Two high-quality sandwiches. These are provided for convenience
  in writing test cases
}
```

Renders like:

```
test-sandwich-1 : sandwich?
test-sandwich-2 : sandwich?
```

> Two high-quality sandwiches. These are provided for convenience in writing test cases

```
(racketgrammar maybe-literals id clause-datum ...+)

maybe-literals =
               | #:literals (literal-id ...)
```

Creates a table to define the grammar of *id*. Each identifier mentioned in a *clause-datum* is typeset as a non-terminal, except for the identifiers listed as *literal-id*s, which are typeset as with `racket`.

```
(racketgrammar* maybe-literals [id clause-datum ...+] ...)
```

Like `racketgrammar`, but for typesetting multiple productions at once, aligned around the `=` and `|`.

```
(defidentifier  id
                [#:form? form?
                 #:index? index?
                 #:show-libs? show-libs?]) → element?
  id : identifier?
  form? : boolean? = #f
  index? : boolean? = #t
  show-libs? : boolean? = #t
```

Typesets *id* as a Racket identifier, and also establishes the identifier as the definition of a binding in the same way as `defproc`, `defform`, etc. As always, the library that provides the identifier must be declared via `defmodule` or `declare-exporting` for an enclosing section.

If *form?* is a true value, then the identifier is documented as a syntactic form, so that uses of the identifier (normally including *id* itself) are typeset as a syntactic form.

If *index?* is a true value, then the identifier is registered in the index.

If *show-libs?* is a true value, then the identifier's defining module may be exposed in the typeset form (e.g., when viewing HTML and the mouse hovers over the identifier).

```
(schemegrammar maybe-literals id clause-datum ...+)
(schemegrammar* maybe-literals [id clause-datum ...+] ...)
```

Compatibility aliases for `racketgrammar` and `racketgrammar*`.

```
(current-display-width) → exact-nonnegative-integer?
(current-display-width w) → void?
  w : exact-nonnegative-integer?
```

Specifies the target maximum width in characters for the output of `defproc` and `defstruct`.

4.2.4 Documenting Classes and Interfaces

```
(defclass maybe-link id super (intf ...) pre-flow ...)

maybe-link =
           | #:link-target? link-target?-expr

     super = super-id
           | (mixin-id super)

      intf = intf-id
           | [#:no-inherit intf-id]
```

Creates documentation for a class *id* that is a subclass of *super* and implements each interface *intf-id*. Each identifier in *super* (except `object%`) and *intf-id* must be documented somewhere via `defclass` or `definterface`.

The decoding of the *pre-flow* sequence should start with general documentation about the class, followed by constructor definition (see `defconstructor`), and then field and method definitions (see `defmethod`). In rendered form, the constructor and method specification are indented to visually group them under the class definition.

When an *intf-id* is specified with #:no-inherit, then the set of inherited methods for *id* does not include methods from *intf-id*. Omitting methods in this way can avoid a documentation dependency when no direct reference to a method of *intf-id* is needed.

Changed in version 1.42 of package scribble-lib: Added #:no-inherit for *intf*.

```
(defclass/title maybe-link id super (intf ...) pre-flow ...)
```

Like defclass, also includes a title declaration with the style 'hidden. In addition, the constructor and methods are not left-indented.

This form is normally used to create a section to be rendered on its own HTML. The 'hidden style is used because the definition box serves as a title.

Changed in version 1.42 of package scribble-lib: Added #:no-inherit for *intf*.

```
(definterface id (intf ...) pre-flow ...)
```

Like defclass, but for an interfaces. Naturally, *pre-flow* should not generate a constructor declaration.

Changed in version 1.42 of package scribble-lib: Added #:no-inherit for *intf*.

```
(definterface/title id (intf ...) pre-flow ...)
```

Like definterface, but for single-page rendering as in defclass/title.

Changed in version 1.42 of package scribble-lib: Added #:no-inherit for *intf*.

```
(defmixin id (domain-id ...) (range-id ...) pre-flow ...)
```

Like defclass, but for a mixin. Any number of *domain-id* classes and interfaces are specified for the mixin's input requires, and any number of result classes and (more likely) interfaces are specified for the *range-id*. The *domain-id*s supply inherited methods, and they can include interfaces annotated with #:no-inherit.

Changed in version 1.42 of package scribble-lib: Added #:no-inherit support for *domain-id*.

```
(defmixin/title id (domain-id ...) (range-id ...) pre-flow ...)
```

Like defmixin, but for single-page rendering as in defclass/title.

```
(defconstructor (arg-spec ...) pre-flow ...)

arg-spec = (arg-id contract-expr-datum)
         | (arg-id contract-expr-datum default-expr)
```

Like `defproc`, but for a constructor declaration in the body of `defclass`, so no return contract is specified. Also, the `new`-style keyword for each *arg-spec* is implicit from the *arg-id*.

```
(defconstructor/make (arg-spec ...) pre-flow ...)
```

Like `defconstructor`, but specifying by-position initialization arguments (for use with `make-object`) instead of by-name arguments (for use with `new`).

```
(defconstructor*/make [(arg-spec ...) ...] pre-flow ...)
```

Like `defconstructor/make`, but with multiple constructor patterns analogous `defproc*`.

```
(defconstructor/auto-super [(arg-spec ...) ...] pre-flow ...)
```

Like `defconstructor`, but the constructor is annotated to indicate that additional initialization arguments are accepted and propagated to the superclass.

```
(defmethod maybe-mode maybe-link (id arg-spec ...)
           result-contract-expr-datum
           pre-flow ...)

maybe-link =
           | #:link-target? link-target?-expr

maybe-mode =
           | #:mode public
           | #:mode public-final
           | #:mode override
           | #:mode override-final
           | #:mode augment
           | #:mode augment-final
           | #:mode extend
           | #:mode extend-final
           | #:mode pubment
```

Like `defproc`, but for a method within a `defclass` or `definterface` body.

The *maybe-mode* specifies whether the method overrides a method from a superclass, and so on. (For these purposes, use `#:mode override` when refining a method of an implemented interface.) The `extend` mode is like `override`, but the description of the method should describe only extensions to the superclass implementation. When *maybe-mode* is not supplied, it defaults to *public*.

Changed in version 1.35 of package `scribble-lib`: Added a check against invalid *maybe-mode*.

```
(defmethod* maybe-mode maybe-link
            ([(id arg-spec ...)
              result-contract-expr-datum] ...)
            pre-flow ...)
```

Like `defproc*`, but for a method within a `defclass` or `definterface` body. The *maybe-mode* specification is as in `defmethod`.

```
(method class/intf-id method-id)
```

Creates a hyperlink to the method named by *method-id* in the class or interface named by *class/intf-id*. The hyperlink names the method, only; see also `xmethod`.

For-label binding information is used with *class/intf-id*, but not *method-id*.

```
(xmethod class/intf-id method-id)
```

Like `method`, but the hyperlink shows both the method name and the containing class/interface.

```
(this-obj)
```

Within a `defmethod` or similar form, typesets as a meta-variable that stands for the target of the method call. Use `(this-obj)` to be more precise than prose such as "this method's object."

4.2.5 Documenting Signatures

```
(defsignature id (super-id ...) pre-flow ...)
```

Defines a signature *id* that extends the *super-id* signatures. Any elements defined in decoded *pre-flow*s—including forms, procedures, structure types, classes, interfaces, and mixins—are defined as members of the signature instead of direct bindings. These definitions can be referenced through `sigelem` instead of `racket`.

The decoded *pre-flow*s inset under the signature declaration in the typeset output, so no new sections, etc. can be started.

```
(defsignature/splice id (super-id ...) pre-flow ...)
```

Like `defsignature`, but the decoded *pre-flow*s are not typeset under the signature declaration, and new sections, etc. can be started in the *pre-flow*s.

```
(signature-desc pre-flow ...) → any/c
  pre-flow : pre-flow?
```

Produces an opaque value that `defsignature` recognizes to outdent in the typeset form. This is useful for text describing the signature as a whole to appear right after the signature declaration.

```
(sigelem sig-id id)
```

Typesets the identifier *id* with a hyperlink to its definition as a member of the signature named by *sig-id*.

4.2.6 Defining Documentation Forms

```
(require scribble/manual-def)
```
package: `scribble-lib`

The `scribble/manual-def` module provides utilities for building new documentation forms like `defform` and `defproc`. See also `boxed-style` and `add-background-label`.

Added in version 1.64 of package `scribble-lib`.

```
(make-id-element  id
                  str
                  defn?
                 [#:space space
                  #:suffix suffix
                  #:link-style link-style
                  #:unlinked-ok? unlinked-ok?]) → content?
  id : identifier?
  str : string?
  defn? : any/c
  space : (or/c #f symbol?) = #f
  suffix : (or/c #f symbol? serializable?) = #f
  link-style : (or/c #f style?) = #f
  unlinked-ok? : any/c = #f
```

Creates an element that typesets *id* as code hyperlinked to its definition. The given *str* is used as the identifier's typeset form, while *id* is used for its `for-label` binding information. If *defn?* is true, the identifier is a typeset as the defining instance (for use in a definition box, normally).

The *space* argument indicates a space (in the sense of `only-space-in`) for the binding. The *suffix* argument provides an additional suffix on the documentation key, when not

`#f`, and it normally should include *space* if *space* is not `#f`. The *suffix* might have additional components to, for example, indicate a name syntactically accessible via *id*, such as through a field-selecting dot notation.

If *unlinked-ok?* is `#false`, then if no link target is found based on the `for-label` binding of *id* in *space*, the identifier is typeset as a failed hyperlink. Otherwise, it is typeset without linking.

```
(id-to-target-maker  id
                     dep?
                    [#:space space
                     #:suffix suffix])
 → (content? (-> tag? content?) . -> . content?)
  id : identifier?
  dep? : any/c
  space : (or/c #f symbol?) = #f
  suffix : (or/c #f symbol? serializable?) = #f
```

Produces a function to wrap content as a cross-reference link target for the defining instance of the binding indicated by *id*, *space* and *suffix*—which are used as in `make-id-element`.

The resulting *make-target* procedure expects content that is used before the resolve pass (e.g., to extract content text) plus a procedure that takes a cross-reference tag and produces a content representing the specific cross reference target. The procedure passed to *make-target* receives a tag representing the binding, and it typically generates a `target-element` (possibly a `toc-target2-element`) using that tag. The generated `target-element` may also include indexing information using the same tag, and where `with-exporting-libraries` is used to construct the index description.

```
(id-to-form-target-maker  id
                          dep?
                         [#:space space
                          #:suffix suffix])
 → (content? (-> tag? content?) . -> . content?)
  id : identifier?
  dep? : any/c
  space : (or/c #f symbol?) = #f
  suffix : (or/c #f symbol? serializable?) = #f
```

Like `id-to-target-maker`, but intended for syntactic forms instead than value bindings. In the default manual style, both are style the same.

```
(annotate-exporting-library  content
                            [#:format-module-path fmt]) → content?
  content : content?
  fmt : (any/c . -> . string?) = ~s
```

Wraps content for a defining instance of some identifier to indicate the module path that exports the identifier. This module will be determined via `defmodule` or `declare-exporting` in an enclosing section.

```
(with-exporting-libraries make-desc) → delayed-index-desc?
  make-desc : (list? . -> . exported-index-desc?)
```

Creates an index description that incorporates information about relevant modules. Relevant module paths will be determined via `defmodule` or `declare-exporting` in an enclosing section and passed to *make-desc*, whose result will replace the result of `with-exporting-libraries` for indexing.

4.2.7 Various String Forms

```
(aux-elem pre-content ...) → element?
  pre-content : pre-content?
```

Like `elem`, but adds an `'aux` style property.

```
(defterm pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the decoded *pre-content* as a defined term (e.g., in italic). Consider using `deftech` instead, though, so that uses of `tech` can hyper-link to the definition.

```
(onscreen pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the decoded *pre-content* as a string that appears in a GUI, such as the name of a button.

```
(menuitem menu-name item-name) → element?
  menu-name : string?
  item-name : string?
```

Typesets the given combination of a GUI's menu and item name.

```
(filepath pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the decoded *pre-content* as a file name (e.g., in typewriter font and in quotes).

```
(exec content ...) → element?
  content : content?
```

Typesets the *content* as a command line (e.g., in typewriter font).

```
(envvar pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the given decoded *pre-content* as an environment variable (e.g., in typewriter font). See also indexed-envvar.

```
(Flag pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the given decoded *pre-content* as a flag (e.g., in typewriter font with a leading -).

```
(DFlag pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the given decoded *pre-content* a long flag (e.g., in typewriter font with two leading -s).

```
(PFlag pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the given decoded *pre-content* as a + flag (e.g., in typewriter font with a leading +).

```
(DPFlag pre-content ...) → element?
  pre-content : pre-content?
```

Typesets the given decoded *pre-content* a long + flag (e.g., in typewriter font with two leading +s).

4.2.8 Links

See also §3.1.6 “Links”.

```
(racketlink id #:style style-expr pre-content ...)
(racketlink id pre-content ...)

  id : identifier?
  pre-content : pre-content?
```

An element where the decoded *pre-content* is hyperlinked to the definition of *id*.

```
(schemelink id pre-content ...)
```

Compatibility alias for racketlink.

```
(link  url
       pre-content ...
      [#:underline? underline?
       #:style style])          → element?
  url : string?
  pre-content : pre-content?
  underline? : any/c = #t
  style : (or/c style? string? symbol? #f)
        = (if underline? #f "plainlink")
```

Alias of hyperlink for backward compatibility.

```
(other-manual  module-path
               [#:underline? underline?]) → element?
  module-path : module-path?
  underline? : any/c = #t
```

Alias of other-doc for backward compatibility.

```
(deftech  pre-content
          ...
         [#:key key
          #:normalize? normalize?
          #:style style?
          #:index-extras index-extras]) → element?
  pre-content : pre-content?
  key : (or/c string? #f) = #f
  normalize? : any/c = #t
  style? : any/c = #t
  index-extras : desc-extras/c = (hash)
```

Produces an element for the decoded *pre-content*, and also defines a term that can be referenced elsewhere using tech.

When *key* is #f, the content->string result of the decoded *pre-content* is used as a key for references. If *normalize?* is true, then the key string is normalized as follows:

- The string is case-folded.
- A trailing “ies” is replaced by “y”.

- A trailing “s” is removed.
- Consecutive hyphens and whitespaces are all replaced by a single space.

These normalization steps help support natural-language references that differ slightly from a defined form. For example, a definition of “bananas” can be referenced with a use of “banana”.

If *style?* is true, then defterm is used on *pre-content*.

The *index-extras* argument is propoagated to the generated index entry for the defined term via index-desc.

Changed in version 1.54 of package scribble-lib: Added the *index-extras* argument.

```
(tech pre-content
      ...
     [#:key key
      #:normalize? normalize?
      #:doc module-path
      #:tag-prefixes prefixes
      #:indirect? indirect?]) → element?
  pre-content : pre-content?
  key : (or/c string? #f) = #f
  normalize? : any/c = #t
  module-path : (or/c module-path? #f) = #f
  prefixes : (or/c (listof string?) #f) = #f
  indirect? : any/c = #f
```

Produces an element for the decoded *pre-content*, and hyperlinks it to the definition of the key as established by deftech. If *key* is false, the decoded content is converted to a string (using content->string) to use as a key; in either case, if *normalize?* is true, the key is normalized in the same way as for deftech. The #:doc and #:tag-prefixes arguments support cross-document and section-specific references, like in secref. For example:

```
(tech #:doc '(lib "scribblings/reference/reference.scrbl") "blame
object")
```

creates a link to blame object in *The Racket Reference*. If *indirect?* is not #f, the link’s resolution in HTML is potentially delayed; see 'indirect-link for link-element.

With the default style files, the hyperlink created by tech is somewhat quieter than most hyperlinks: the underline in HTML output is gray, instead of blue, and the term and underline turn blue only when the mouse is moved over the term.

In some cases, combining both natural-language uses of a term and proper linking can require some creativity, even with the normalization performed on the term. For example,

if “bind” is defined, but a sentence uses the term “binding,” the latter can be linked to the former using `@tech{bind}ing`.

Changed in version 1.46 of package `scribble-lib`: Added `#:indirect?` argument.

```
(techlink pre-content
          ...
          [#:key key
           #:normalize? normalize?
           #:doc module-path
           #:tag-prefixes prefixes
           #:indirect? indirect?]) → element?
  pre-content : pre-content?
  key : (or/c string? #f) = #f
  normalize? : any/c = #t
  module-path : (or/c module-path? #f) = #f
  prefixes : (or/c (listof string?) #f) = #f
  indirect? : any/c = #f
```

Like `tech`, but the link is not quiet. For example, in HTML output, a hyperlink underline appears even when the mouse is not over the link.

Changed in version 1.46 of package `scribble-lib`: Added `#:indirect?` argument.

4.2.9 Indexing

See also §3.1.7 “Indexing” for `scribble/base`.

```
(indexed-racket datum ...)
```

A combination of `racket` and `as-index`, with the following special cases when a single *datum* is provided:

- If *datum* is a `quote` form, then the quote is removed from the key (so that it’s sorted using its unquoted form).
- If *datum* is a string, then quotes are removed from the key (so that it’s sorted using the string content).

```
(indexed-scheme datum ...)
```

Compatibility alias for `indexed-racket`.

```
(idefterm pre-content ...) → element?
  pre-content : pre-content?
```

Combines as-index and defterm. The content normally should be plural, rather than singular. Consider using deftech, instead, which always indexes.

```
(pidefterm pre-content ...) → element?
  pre-content : pre-content?
```

Like idefterm, but plural: adds an "s" on the end of the content for the index entry. Consider using deftech, instead.

```
(indexed-file pre-content ...) → element?
  pre-content : pre-content?
```

A combination of file and as-index, but where the sort key for the index iterm does not include quotes.

```
(indexed-envvar pre-content ...) → element?
  pre-content : pre-content?
```

A combination of envvar and as-index.

4.2.10 Bibliography

See also scriblib/autobib.

```
(cite key ...+) → element?
  key : string?
```

Links to a bibliography entry, using the *key*s both to indicate the bibliography entry and, in square brackets, as the link text.

```
(bibliography [#:tag tag] entry ...) → part?
  tag : string? = "doc-bibliography"
  entry : bib-entry?
```

Creates a bibliography part containing the given entries, each of which is created with bib-entry. The entries are typeset in order as given.

```
(bib-entry  #:key key
            #:title title
           [#:is-book? is-book?
            #:author author
            #:location location
            #:date date
            #:url url
            #:note note])        → bib-entry?
```

```
key : string?
title : (or/c #f pre-content?)
is-book? : boolean? = #f
author : (or/c #f pre-content?) = #f
location : (or/c #f pre-content?) = #f
date : (or/c #f pre-content?) = #f
url : (or/c #f pre-content?) = #f
note : (or/c #f pre-content?) = #f
```

Creates a bibliography entry. The *key* is used to refer to the entry via `cite`. The other arguments are used as elements in the entry:

- *title* is the title of the cited work. It will be surrounded by quotes in typeset form if *is-book?* is `#f`, otherwise it is typeset via `italic`.
- *author* lists the authors. Use names in their usual order (as opposed to "last, first"), and separate multiple names with commas using "and" before the last name (where there are multiple names). The *author* is typeset in the bibliography as given, or it is omitted if given as `#f`.
- *location* names the publication venue, such as a conference name or a journal with volume, number, and pages. The *location* is typeset in the bibliography as given, or it is omitted if given as `#f`.
- *date* is a date, usually just a year (as a string). It is typeset in the bibliography as given, or it is omitted if given as `#f`.
- *url* is an optional URL. It is typeset in the bibliography using `tt` and hyperlinked, or it is omitted if given as `#f`.
- *note* is an optional comment about the work. It is typeset in the bibliography as given, and appears directly after the date (or URL, if given) with no space or punctuation in between.

Changed in version 1.29 of package `scribble-lib`: Added the `#:note` option.

```
(bib-entry? v) → boolean?
  v : any/c
```

Returns `#t` if *v* is a bibliography entry created by `bib-entry`, `#f` otherwise.

4.2.11 Version History

```
(history clause ...+)
```

```
clause = #:added version-expr
       | #:changed version-expr content-expr

  version-expr : valid-version?
  content-expr : content?
```

Generates a block for version-history notes. The version refers to a package as determined by a `defmodule` or `declare-exporting` declaration within an enclosing section.

Normally, `history` should be used at the end of a `defform`, `defproc`, etc., entry, although it may also appear in a section that introduces a module (that has been added to a package). In the case of a `changed` entry, the content produced by *content-expr* should normally start with a capital letter and end with a period, but it can be a sentence fragment such as "Added a `#:changed` form."

Examples:

```
@defthing[tasty-burrito burrito?]{
  Compatible with the API of a sandwich, but not legally a
  sandwich in Massachusetts.

  @history[#:added "1.0"
           #:changed "1.1" "Refactored tortilla."
           #:changed "1.2" @elem{Now includes @emph{guacamole}.}]
}
```

Renders like:

```
tasty-burrito : burrito?
```

> Compatible with the API of a sandwich, but not legally a sandwich in Massachusetts.
>
> Added in version 1.0 of package `scribble-lib`.
>
> Changed in version 1.1: Refactored tortilla.
>
> Changed in version 1.2: Now includes *guacamole*.

Added in version 1.1 of package `scribble-lib`.

4.2.12 Miscellaneous

```
(t pre-content ...) → paragraph?
  pre-content : pre-content?
```

Wraps the decoded *pre-content* as a paragraph.

```
etc : element?
```

Like "etc.", but with an abbreviation-ending period for use in the middle of a sentence.

```
PLaneT : element?
```

"PLaneT" (to help make sure you get the letters in the right case).

```
manual-doc-style : style?
```

A style to be used for a document's main part to get the style configuration of #lang scribble/manual. See §4.2.14 "Manual Rendering Style".

```
(hash-lang) → element?
```

Returns an element for #lang that is hyperlinked to an explanation.

```
void-const : element?
```

Returns an element for #<void>.

```
undefined-const : element?
```

Returns an element for #<undefined>.

```
(commandline content ...) → paragraph?
  content : content?
```

Produces an inset command-line example (e.g., in typewriter font).

```
(inset-flow pre-flow ...) → nested-flow?
  pre-flow : pre-flow?
```

Creates a nested-flow with indenting on the left and right.

Using nested with the 'inset style is a prefered alternative.

```
(centerline pre-flow ...) → nested-flow?
  pre-flow : pre-flow?
```

An alias for centered for backward compatibility.

```
(math pre-content ...) → element?
  pre-content : any/c
```

The decoded *pre-content* is further transformed:

- Any immediate `'rsquo` is converted to `'prime`.
- Parentheses and sequences of decimal digits in immediate strings are left as-is, but any other immediate string is italicized.
- When `_` appears before a non-empty sequence of numbers, letters, and `-`, the sequence is typeset as a subscript.
- When `^` appears before a non-empty sequence of numbers, letters, and `-`, the sequence is typeset as a superscript.

```
(filebox filename pre-flow ...) → block?
  filename : (or/c string? element?)
  pre-flow : pre-flow?
```

Typesets the *pre-flow*s as the content of *filename*. For example, the content may be inset on the page with *filename* above it. If *filename* is a string, it is passed to `filepath` to obtain an `element`.

```
(deprecated [#:what what]
            replacement
            additional-notes ...) → block?
  what : content? = "library"
  replacement : content?
  additional-notes : content?
```

Produces an inset warning for deprecated libraries, functions, etc. (as described by *what*), where *replacement* describes a suitable replacement. The *additional-notes* are included after the initial deprecation message.

```
(image/plain filename-relative-to-source
             pre-element ...)            → element?
  filename-relative-to-source : string?
  pre-element : any/c
```

An alias for `image` for backward compatibility.

```
boxed-style : style?
```

The style used for a table for defining a binding, such as the one produced by defform or defproc.

```
(add-background-label kind) → (-> (list/c block?) block?)
  kind : string?
```

Produces a function that adds a label to a block in the same way as the block produces by defform, defproc, etc. The block is provided in a flow that has a single block.

4.2.13 Index-Entry Descriptions

```
(require scribble/manual-struct)
```
package: scribble-lib

The scribble/manual-struct library provides types used to describe index entries created by scribble/manual functions. These structure types are provided separate from scribble/manual so that scribble/manual need not be loaded when deserializing cross-reference information that was generated by a previously rendered document.

```
(struct index-desc (extras)
    #:extra-constructor-name make-index-desc)
  extras : desc-extras/c
desc-extras/c : contract?
```

Provides optional information about an index entry through an extras hash table. All values in the hash table should be writeable in the sense that read will reconstruct the value. Any symbol is allowed as a key in extras, but some are well-known:

- 'language-family: A list strings describing language families for which this entry is relevant. If this key is missing, the default language-family list is '("Racket").
- 'sort-order: A real number that is used to order this entry with respect to others that have the same key. Smaller values of 'sort-order are shown before later values, and the default is 0.
- 'kind: A string describing the binding's category, such as "procedure" or "class". Like most other values in extras, this string is not added to the index entry's main text as shown to a user, but it may be rendered by some interfaces, such as to the side or in hover text.
- 'module-kind: A symbol indicating an entry for a module as documented with defmodule, where the symbol is 'lang for a module documented with #:lang, 'reader for a module documented with #:reader, and 'lib otherwise.
- 'part?: A boolean indicating whether the index entry describes a section within a document.

- `'hidden?`: A boolean indicating that the index entry describes a binding that is covered from a user's perspective by a different index entry. These are considered redundant and filtered from index rendering.

When index entries are recorded, the entry's `extras` table can receive additional key–value mappings via part context using the `'index-extras` key. See `index-element` for more information.

The `desc-extras/c` contract is equivalent to

```
(hash/dc [k symbol?]
         [v (k)
            (case k
              [(language-family) (listof string?)]
              [(sort-order) real?]
              [(kind) string?]
              [(module-kind) (or/c 'lib 'lang 'reader)]
              [(part?) boolean?]
              [(hidden?) boolean?]
              [else any/c])]
         #:immutable #t)
```

The `index-desc` struct is preferable over other index entry descriptions below, except for `exported-index-desc` and `exported-index-desc*`.

Added in version 1.54 of package `scribble-lib`.

```
(struct module-path-index-desc ()
    #:extra-constructor-name make-module-path-index-desc)
```

NOTE: This struct is deprecated; use `index-desc`, instead.

Indicates that the index entry corresponds to a module definition via `defmodule` and company.

```
(struct language-index-desc module-path-index-desc ()
    #:extra-constructor-name make-language-index-desc)
(struct reader-index-desc module-path-index-desc ()
    #:extra-constructor-name make-reader-index-desc)
```

NOTE: This struct is deprecated; use `index-desc`, instead.

Indicates that the index entry corresponds to a module definition via `defmodule` with the `#:lang` or `#:reader` option. For example, a module definition via `defmodulelang` has a `language-index-desc` index entry and a module definition via `defmodulereader` has a `reader-index-desc` index entry.

```
(struct exported-index-desc (name from-libs)
    #:extra-constructor-name make-exported-index-desc)
  name : symbol?
  from-libs : (listof module-path?)
```

Indicates that the index entry corresponds to the definition of an exported binding. The `name` field and `from-libs` list correspond to the documented name of the binding and the primary modules that export the documented name (but this list is not exhaustive, because new modules can re-export the binding).

```
(struct exported-index-desc* exported-index-desc (extras)
    #:extra-constructor-name make-exported-index-desc*)
  extras : (and/c desc-extras/c
                  (hash/dc [k symbol?]
                           [v (k)
                              (case k
                                [(display-from-libs) (listof content?)]
                                [(method-name) symbol?]
                                [(constructor?) boolean?]
                                [(class-tag) tag?]
                                [(long-key) string?]
                                [else any/c])]
                           #:immutable #t))
```

Like `exported-index-desc`, but with additional optional information in an `extras` hash table like `index-desc`. Some additional keys are well-known:

- `'display-from-libs`: A list of content in parallel to the `from-libs` field that renders the exporting library in the module's language's native form.
- `'method-name`: A symbol indicating that the index entry describes a method for the class that is in the `name` field, and the symbol is the method's name.
- `'constructor?`: A boolean indicating that the index entry describes a class's constructor, separate from an index entry for the class. A constructor normally also has `'hidden?` as true.
- `'class-tag`: A tag that links to the class's main entry in the case of a method or constructor index entry, where the `name` field has the class name in both cases.
- `'long-key`: An alternative string for searches to match. This string is useful when the name that is normally used to refer to a binding has an extra prefix that is added on import, for example.

The exported-index-desc* struct is preferable over other index entry descriptions below.

Added in version 1.53 of package scribble-lib.
Changed in version 1.59: Added 'long-key.

```
(struct form-index-desc exported-index-desc ()
    #:extra-constructor-name make-form-index-desc)
```

NOTE: This struct is deprecated; use exported-index-desc*, instead.

Indicates that the index entry corresponds to the definition of a syntactic form via defform and company.

```
(struct procedure-index-desc exported-index-desc ()
    #:extra-constructor-name make-procedure-index-desc)
```

NOTE: This struct is deprecated; use exported-index-desc*, instead.

Indicates that the index entry corresponds to the definition of a procedure binding via defproc and company.

```
(struct thing-index-desc exported-index-desc ()
    #:extra-constructor-name make-thing-index-desc)
```

NOTE: This struct is deprecated; use exported-index-desc*, instead.

Indicates that the index entry corresponds to the definition of a binding via defthing and company.

```
(struct struct-index-desc exported-index-desc ()
    #:extra-constructor-name make-struct-index-desc)
```

NOTE: This struct is deprecated; use exported-index-desc*, instead.

Indicates that the index entry corresponds to the definition of a structure type via defstruct and company.

```
(struct class-index-desc exported-index-desc ()
    #:extra-constructor-name make-class-index-desc)
```

NOTE: This struct is deprecated; use `exported-index-desc*`, instead.

Indicates that the index entry corresponds to the definition of a class via `defclass` and company.

```
(struct interface-index-desc exported-index-desc ()
    #:extra-constructor-name make-interface-index-desc)
```

NOTE: This struct is deprecated; use `exported-index-desc*`, instead.

Indicates that the index entry corresponds to the definition of an interface via `definterface` and company.

```
(struct mixin-index-desc exported-index-desc ()
    #:extra-constructor-name make-mixin-index-desc)
```

NOTE: This struct is deprecated; use `exported-index-desc*`, instead.

Indicates that the index entry corresponds to the definition of a mixin via `defmixin` and company.

```
(struct method-index-desc exported-index-desc (method-name
                                                class-tag)
    #:extra-constructor-name make-method-index-desc)
  method-name : symbol?
  class-tag : tag?
```

NOTE: This struct is deprecated; use `exported-index-desc*`, instead.

Indicates that the index entry corresponds to the definition of an method via `defmethod` and company. The *name* field from `exported-index-desc` names the class or interface that contains the method. The `method-name` field names the method. The `class-tag` field provides a pointer to the start of the documentation for the method's class or interface.

```
(struct constructor-index-desc exported-index-desc (class-tag)
    #:extra-constructor-name make-constructor-index-desc)
  class-tag : tag?
```

NOTE: This struct is deprecated; use `exported-index-desc*`, instead.

Indicates that the index entry corresponds to a constructor via `defconstructor` and company. The *`name`* field from `exported-index-desc` names the class or interface that contains the method. The `class-tag` field provides a pointer to the start of the documentation for the method's class or interface.

4.2.14 Manual Rendering Style

Using `#lang scribble/manual` for the main `part` of a document associates style properties on the `doc` export to select the Racket manual style for rendering.

A `html-defaults` style property is added to `doc`, unless `doc`'s style already has a `html-defaults` style property (e.g., supplied to `title`). Similarly, a `latex-defaults` style property is added if one is not already present. Finally, an `css-style-addition` property is always added.

For HTML rendering:

- The document's prefix file is set to `"scribble-prefix.html"`, as usual, in `html-defaults`.
- The document's style file is set to `"manual-style.css"` from the `"scribble"` collection in `html-defaults`.
- The file `"manual-fonts.css"` from the `"scribble"` collection is designated as an additional accompanying file in `html-defaults`.
- The file `"manual-racket.css"` from the `"scribble"` collection is added as a `css-style-addition`.
- The document's initial scale (for responsive modes such as mobile devices) via a `(initial-scale "0.8")` style property.

To obtain this configuration without using `#lang scribble/manual`, use `manual-doc-style`.

4.3 Racket

```
(require scribble/racket)
(require scribble/scheme)
```
package: scribble-lib

The scribble/racket library (or scribble/scheme for backward compatibility) provides utilities for typesetting Racket code. The scribble/manual forms provide a higher-level interface.

```
(define-code id typeset-expr)
(define-code id typeset-expr uncode-id)
(define-code id typeset-expr uncode-id d->s-expr)
(define-code id typeset-expr uncode-id d->s-expr stx-prop-expr)
```

Binds *id* to a form similar to racket or racketblock for typesetting code. The form generated by define-code handles source-location information, escapes via unquote by default, preserves binding and property information, and supports element transformers.

The supplied *typeset-expr* expression should produce a procedure that performs the actual typesetting. This expression is normally to-element or to-paragraph. The argument supplied to *typeset-expr* is normally a syntax object, but more generally it is the result of applying *d->s-expr*.

The optional *uncode-id* specifies the default escape from literal code to be recognized by *id*, and the default for *uncode-id* is unsyntax. A use of the *id* form can specify an alternate escape via #:escape, as in racketblock and racket.

The optional *d->s-expr* should produce a procedure that accepts three arguments suitable for datum->syntax: a syntax object or #f, an arbitrary value, and a vector for a source location. The result should record as much or as little of the argument information as needed by *typeset-expr* to typeset the code. Normally, *d->s-expr* is datum->syntax.

The *stx-prop-expr* should produce a procedure for recording a 'paren-shape property when the source expression uses with *id* has such a property. The default is syntax-property.

```
(to-paragraph  v
               [#:expr? expr?
                #:escapes? escapes?
                #:color? color?
                #:wrap-elem wrap-elem]) → block?
  v : any/c
  expr? : any/c = #f
  escapes? : any/c = #t
  color? : any/c = #t
  wrap-elem : (element? . -> . element?) = (lambda (e) e)
```

Typesets an S-expression that is represented by a syntax object, where source-location information in the syntax object controls the generated layout. When source-location information is not available, default spacing is used (in the same single-line style as `to-element`).

Identifiers that have `for-label` bindings are typeset and hyperlinked based on definitions declared elsewhere (via `defproc`, `defform`, etc.). Unless *escapes?* is `#f`, the identifiers `code:line`, `code:comment`, `code:blank`, `code:hilite`, and `code:quote` are handled as in `racketblock`, as are identifiers that start with `_`.

In addition, the given *v* can contain `var-id`, `shaped-parens`, `just-context`, or `literal-syntax` structures to be typeset specially (see each structure type for details), or it can contain `element` structures that are used directly in the output.

If a syntax object within *v* has the `'display-string` syntax property on any form can supply a string to use for the typeset form, instead of the way it would typeset otherwise.

If *expr?* is true, then *v* is rendered in expression style, much like `print` with the `print-as-expression` parameter set to `#t`. In that case, `for-label` bindings on identifiers are ignored, since the identifiers are all quoted in the output. Typically, *expr?* is set to true for printing result values.

If *color?* is `#f`, then the output is typeset without coloring.

The *wrap-elem* procedure is applied to each element constructed for the resulting block. When combined with `#f` for *color?*, for example, the *wrap-elem* procedure can be used to give a style to an element.

```
((to-paragraph/prefix prefix1
                      prefix
                      suffix)
  v
   [#:expr? expr?
  #:escapes? escapes?
  #:color? color?
  #:wrap-elem wrap-elem])      → block?
  prefix1 : any/c
  prefix : any/c
  suffix : any/c
  v : any/c
  expr? : any/c = #f
  escapes? : any/c = #t
  color? : any/c = #f
  wrap-elem : (element? . -> . element?) = (lambda (e) e)
```

Like `to-paragraph`, but *prefix1* is prefixed onto the first line, *prefix* is prefix to any subsequent line, and *suffix* is added to the end. The *prefix1*, *prefix*, and *suffix* arguments are used as content, except that if *suffix* is a list of elements, it is added to the

end on its own line.

```
(to-element  v
             [#:expr? expr?
              #:escapes? escapes?
              #:defn? defn?])      → element?
  v : any/c
  expr? : any/c = #f
  escapes? : any/c = #t
  defn? : any/c = #f
```

Like to-paragraph, except that source-location information is mostly ignored, since the result is meant to be inlined into a paragraph. If *defn?* is true, then an identifier is styled as a definition site.

```
(to-element/no-color  v
                      [#:expr? expr?
                       #:escapes? escapes?]) → element?
  v : any/c
  expr? : any/c = #f
  escapes? : any/c = #t
```

Like to-element, but for-syntax bindings are ignored, and the generated text is uncolored. This variant is typically used to typeset results.

```
(struct var-id (sym)
    #:extra-constructor-name make-var-id)
  sym : (or/c symbol? identifier?)
```

When to-paragraph and variants encounter a var-id structure, it is typeset as sym in the variable font, like racketvarfont—unless the var-id appears under quote or quasiquote, in which case sym is typeset as a symbol.

```
(struct shaped-parens (val shape)
    #:extra-constructor-name make-shaped-parens)
  val : any/c
  shape : char?
```

When to-paragraph and variants encounter a shaped-parens structure, it is typeset like a syntax object that has a 'paren-shape property with value shape.

```
(struct long-boolean (val)
    #:extra-constructor-name make-long-boolean)
  val : boolean?
```

When to-paragraph and variants encounter a long-boolean structure, it is typeset as #true or #false, as opposed to #t or #f.

```
(struct just-context (val context)
    #:extra-constructor-name make-just-context)
  val : any/c
  context : syntax?
```

When to-paragraph and variants encounter a just-context structure, it is typeset using the source-location information of val just the lexical context of ctx.

```
(struct literal-syntax (stx)
    #:extra-constructor-name make-literal-syntax)
  stx : any/c
```

When to-paragraph and variants encounter a literal-syntax structure, it is typeset as the string form of stx. This can be used to typeset a syntax-object value in the way that the default printer would represent the value.

```
(element-id-transformer? v) → boolean?
  v : any/c
```

Provided for-syntax; returns #t if *v* is an element transformer created by make-element-id-transformer, #f otherwise.

```
(make-element-id-transformer proc) → element-id-transformer?
  proc : (syntax? . -> . syntax?)
```

Provided for-syntax; creates an *element transformer*. When an identifier has a transformer binding to an element transformer, then forms generated by define-code (including racket and racketblock) typeset the identifier by applying the *proc* to the identifier. The result must be an expression whose value, typically an element, is passed on to functions like to-paragraph .

```
(variable-id? v) → boolean?
  v : any/c
```

Provided for-syntax; returns #t if *v* is an element transformer created by make-variable-id, #f otherwise.

```
(make-variable-id sym) → variable-id?
  sym : (or/c symbol? identifier?)
```

Provided for-syntax; like make-element-id-transformer for a transformer that produces *sym* typeset as a variable (like racketvarfont)—unless it appears under quote or quasiquote, in which case *sym* is typeset as a symbol.

```
output-color : style?
input-color : style?
input-background-color : style?
no-color : style?
reader-color : style?
result-color : style?
keyword-color : style?
comment-color : style?
paren-color : style?
meta-color : style?
value-color : style?
symbol-color : style?
variable-color : style?
opt-color : style?
error-color : style?
syntax-link-color : style?
value-link-color : style?
module-color : style?
module-link-color : style?
block-color : style?
highlighted-color : style?
```

Styles that are used for coloring Racket programs, results, and I/O.

4.4 Evaluation and Examples

```
(require scribble/example)
```
package: scribble-lib

The scribble/example library provides utilities for evaluating code at document-build time and incorporating the results in the document, especially to show example uses of defined procedures and syntax.

Added in version 1.16 of package scribble-lib.

```
(examples option ... datum ...)
```

```
option = #:eval eval-expr
       | #:once
       | #:escape escape-id
       | #:label label-expr
       | #:hidden
       | #:result-only
       | #:no-inset
       | #:no-prompt
       | #:preserve-source-locations
       | #:no-result
       | #:lang language-name
```

Similar to `racketinput`, except that the result for each input *datum* is shown on the next line. The result is determined by evaluating the `quoted` form of the *datum* using the evaluator produced by *eval-expr*.

Each keyword option can be provided at most once:

- `#:eval` *eval-expr* — Specifies an evaluator, where *eval-expr* must produce either `#f` or a sandbox evaluator via `make-evaluator` or `make-module-evaluator` with the `sandbox-output` and `sandbox-error-output` parameters set to `'string`. If *eval-expr* is not provided or is `#f`, an evaluator is created using `make-base-eval`. See also `make-eval-factory`.
- `#:once` — Specifies that the evaluator should be closed with `close-eval` after the all *datum*s are evaluated. The `#:once` option is assumed if `#:eval` is not specified.
- `#:escape` *escape-id* — Specifies an escape identifier, as in `racketblock`.
- `#:label` *label-expr* — Specifies a label for the examples, which defaults to "Example:" or "Examples:" (depending on the number of *datum*s). A `#f` value for *label-expr* suppresses the label.
- `#:hidden` — Specifies that the *datum*s and results should not be typeset, but instead evaluated for a side-effect, and disables `eval:error`. Typically, this option is combined with `#:eval` to configure an evaluator.
- `#:result-only` — Specifies that the *datum* results should be typeset, but not the *datum*s themselves, and implies `#:label #f`.
- `#:no-result` — Implies `#:no-prompt` and `#:label #f`, specifies that no results should be typeset, and disables `eval:error`.
- `#:no-inset` — Specifies that the examples should be typeset without indentation, i.e., like `racketinput0` instead of `racketinput`.
- `#:no-prompt` — Specifies that each examples should be typeset without a leading prompt, i.e., like `racketblock` instead of `racketinput`. A prompt can be omitted from a specific *datum* by wrapping it with `eval:no-prompt`.

- `#:preserve-source-locations` — Specifies that the original source locations for each *datum* should be preserved for evaluation. Preserving source locations can be useful for documenting forms that depend on source locations, such as Redex's typesetting macros.

- `#:lang` — Implies `#:no-result` prefixes the typeset *datum* sequence with a `#lang` line using *language-name* as the module's language.

Certain patterns in *datum* are treated specially:

- A *datum* of the form `(code:line` *code-datum* `(code:comment` *comment-datum* `...))` is treated as *code-datum* for evaluation.

- A *datum* of the form `(code:line` *code-datum* `...)` evaluates each *code-datum*, but only the last result is used.

- Other uses of `code:comment`, `code:contract`, and `code:blank` are stripped from each *datum* before evaluation.

- A *datum* of the form `(eval:error` *eval-datum*`)` is treated like *eval-datum*, but *eval-datum* is expected to raise an exception, and an error is shown as the evaluation's result.

- A *datum* of the form `(eval:alts` *show-datum* *eval-datum*`)` is treated as *show-datum* for typesetting and *eval-datum* for evaluation.

- A *datum* of the form `(eval:check` *eval-datum* *expect-datum*`)` is treated like *eval-datum*, but *check-datum* is also evaluated, and an error is raised if they are not `equal?`.

- A *datum* of the form `(eval:result` *content-expr* *out-expr* *err-expr*`)` involves no sandboxed evaluation; instead, the content result of *content-expr* is used as the typeset form of the result, *out-expr* is treated as output printed by the expression, and *err-expr* is error output printed by the expression. The *out-expr* and/or *err-expr* can be omitted, in which case they default to empty strings.

  Normally, `eval:result` is used in the second part of an `eval:alts` combination. Otherwise, *content-expr* is typeset as the input form (which rarely makes sense for a reader of the example).

- A *datum* of the form `(eval:results` *content-list-expr* *out-expr* *err-expr*`)` is treated like an `eval:result` form, except that *content-list-expr* should produce a list of content for multiple results of evaluation. As with `eval:result`, *out-expr* and *err-expr* are optional.

- A *datum* of the form `(eval:no-prompt` *eval-datum* `...)` is treated like `(code:line` *eval-datum* `...)`, but no prompt is shown before the group, and a blank line is added before and after *eval-datum* and its result.

A *datum* cannot be a keyword. To specify a *datum* that is a keyword, wrap it with code:line.

When evaluating a *datum* produces an error (and *datum* does not have an eval:error wrapper), an exception is raised by examples.

If the value of current-print in the sandbox is changed from its default value, or if print-as-expression in the sandbox is set to #f, then each evaluation result is formatted to a port by applying (current-print) to the value; the output port is set to a pipe that supports specials in the sense of write-special, and non-character values written to the port are used as content. Otherwise, when the default current-print is in place, result values are typeset using to-element/no-color.

As an example,

```
#lang scribble/manual
@(require racket/sandbox
          scribble/example)
@(define my-evaluator
   (parameterize ([sandbox-output 'string]
                  [sandbox-error-output 'string]
                  [sandbox-memory-limit 50])
     (make-evaluator 'typed/racket/base)))

@examples[#:eval my-evaluator
          (: my-sqr (Real -> Real))
          (define (my-sqr x)
            (* x x))
          (my-sqr 42)]
```

uses an evaluator whose language is typed/racket/base.

```
(make-base-eval [#:pretty-print? pretty-print?
                 #:lang lang]
                 input-program ...)
 → (any/c . -> . any)
  pretty-print? : any/c = #t
  lang : (or/c module-path?              = '(begin)
              (list/c 'special symbol?)
              (cons/c 'begin list?))
  input-program : any/c
```

Creates an evaluator using (make-evaluator 'racket/base #:lang *lang input-program* ...), setting sandbox parameters to disable limits, setting the outputs to 'string, and not adding extra security guards.

If *pretty-print?* is true, the sandbox's printer is set to pretty-print-handler. In that case, values that are convertible in the sense of convertible? are printed using write-special, except that values that are serializable in the sense of serializable? are serialized for tranfers from inside the sandbox to outside (which can avoid pulling code and support from the sandboxed environment into the document-rendering environment).

Changed in version 1.6 of package scribble-lib: Changed treatment of convertible values that are serializable.

```
(make-base-eval-factory  mod-paths
                         [#:pretty-print? pretty-print?
                          #:lang lang])
 → (-> (any/c . -> . any))
  mod-paths : (listof module-path?)
  pretty-print? : any/c = #t
  lang : (or/c module-path?                 = '(begin)
              (list/c 'special symbol?)
              (cons/c 'begin list?))
```

Produces a function that is like make-base-eval, except that each module in *mod-paths* is attached to the evaluator's namespace. The modules are loaded and instantiated once (when the returned make-base-eval-like function is called the first time) and then attached to each evaluator that is created.

```
(make-eval-factory  mod-paths
                    [#:pretty-print? pretty-print?
                     #:lang lang])
 → (-> (any/c . -> . any))
  mod-paths : (listof module-path?)
  pretty-print? : any/c = #t
  lang : (or/c module-path?                 = '(begin)
              (list/c 'special symbol?)
              (cons/c 'begin list?))
```

Like make-base-eval-factory, but each module in *mod-paths* is also required into the top-level environment for each generated evaluator.

```
(make-log-based-eval log-file mode) → (-> any/c any)
  log-file : path-string?
  mode : (or/c 'record 'replay)
```

Creates an evaluator (like make-base-eval) that uses a log file to either record or replay evaluations.

If *mode* is 'record, the evaluator records every interaction to *log-file*, replacing *log-file* if it already exists. The result of each interaction must be serializable.

If *mode* is 'replay, the evaluator uses the contents of *log-file* instead of actually performing evaluatings. For each interaction, it compares the term to evaluate against the next interaction recorded in *log-file*. If the term matches, the stored result is returned; if not, the evaluator raises an error indicating that it is out of sync with *log-file*.

Use make-log-based-eval to document libraries when the embedded examples rely on external features that may not be present or appropriately configured on all machines.

Added in version 1.12 of package scribble-lib.

```
(close-eval eval) → (one-of/c "")
  eval : (any/c . -> . any)
```

Shuts down an evaluator produced by make-base-eval. Use close-eval when garbage collection cannot otherwise reclaim an evaluator (e.g., because it is defined in a module body).

```
(scribble-eval-handler)
 → ((any/c . -> . any) boolean? any/c . -> . any)
(scribble-eval-handler handler) → void?
  handler : ((any/c . -> . any) boolean? any/c . -> . any)
```

A parameter that serves as a hook for evaluation. The evaluator to use is supplied as the first argument to the parameter's value. The second argument is #t if exceptions are being captured (to display exception results), #f otherwise. The third argument is the form to evaluate.

```
(scribble-exn->string) → (-> (or/c exn? any/c) string?)
(scribble-exn->string handler) → void?
  handler : (-> (or/c exn? any/c) string?)
```

A parameter that controls how exceptions are rendered by interaction. Defaults to

```
(λ (e)
  (if (exn? e)
      (exn-message e)
      (format "uncaught exception: ~s" e)))
```

4.4.1 Legacy Evaluation

```
(require scribble/eval)
```
package: scribble-lib

The scribble/eval library provides an older interface to the functionality of scribble/example. The scribble/example library should be used, instead.

In addition to the forms listed below, scribble/eval re-exports several functions from scribble/example: make-base-eval make-base-eval-factory, make-eval-factory, make-log-based-eval, close-eval, and scribble-eval-handler.

```
(interaction maybe-options datum ...)

  maybe-options = maybe-eval
                | maybe-escape
                | maybe-no-errors

     maybe-eval =
                | #:eval eval-expr

   maybe-escape =
                | #:escape escape-id

maybe-no-errors =
                | #:no-errors? no-errors?-expr
```

Like examples from scribble/example, except that

- the "Examples:" label is always suppressed,
- exceptions raised during the evaluation of a *datum* are always rendered as errors, unless #:no-errors? is specified with a true value; and
- the #:once option is never implicitly used.

Changed in version 1.14 of package scribble-lib: Added #:no-errors?, eval:no-prompt, and eval:error, and changed code:line to support multiple *datum*s.

```
(interaction0 maybe-options datum ...)
```

Like interaction, but without insetting the code via nested.

Use examples with #:no-indent, instead.

```
(interaction/no-prompt maybe-eval maybe-escape datum)
```

Like interaction, but does not render each *datum* with a prompt.

Use examples with #:no-prompt, instead.

```
(interaction-eval maybe-eval datum)
```

Like `interaction`, evaluates the `quoted` form of *`datum`*, but returns the empty string and does not catch exceptions (so `eval:error` has no effect).

Use `examples` with `#:hidden`, instead.

```
(interaction-eval-show maybe-eval datum)
```

Like `interaction-eval`, but produces an element representing the printed form of the evaluation result.

Use `examples` with `#:result-only`, instead.

```
(racketblock+eval maybe-eval maybe-escape datum ...)
```

Combines `racketblock` and `interaction-eval`.

Use `examples` with `#:no-result`, instead.

```
(racketblock0+eval maybe-eval maybe-escape datum ...)
```

Combines `racketblock0` and `interaction-eval`.

Use `examples` with `#:no-result` and `#:no-indent`, instead.

```
(racketmod+eval maybe-eval maybe-escape name datum ...)
```

Combines `racketmod` and `interaction-eval`.

Use `examples` with `#:lang`, instead.

```
(def+int maybe-options defn-datum expr-datum ...)
```

Like `interaction`, except the *`defn-datum`* is typeset as for `racketblock` (i.e., no prompt) and a line of space is inserted before the *`expr-datum`*s.

```
(defs+int maybe-options (defn-datum ...) expr-datum ...)
```

Like `def+int`, but for multiple leading definitions.

Use `examples` with `eval:no-prompt` wrappers on definitions, instead.

```
(examples maybe-options datum ...)
```

Like `interaction`, but with an “Examples:” label prefixed.

Use `examples` from `scribble/example`, instead.

```
(examples* label-expr maybe-options datum ...)
```

Like `examples`, but using the result of *label-expr* in place of the default “Examples:” label.

Use `examples` from `scribble/example` with the `#:label` option, instead.

```
(defexamples maybe-options datum ...)
```

Like `examples`, but each definition using `define` or `define-struct` among the *datum*s is typeset without a prompt, and with line of space after it.

Use `examples` with `eval:no-prompt` wrappers on definitions, instead.

```
(defexamples* label-expr maybe-options datum ...)
```

Like `defexamples`, but using the result of *label-expr* in place of the default “Examples:” label.

Use `examples` with the `#:label` option and `eval:no-prompt` wrappers on definitions, instead.

```
(as-examples b) → block?
  b : block?
(as-examples label b) → block?
  label : (or/c block? content?)
  b : block?
```

Adds an “examples” label to *b*, using either a default label or the given *label*.

```
(with-eval-preserve-source-locations expr ...)
```

By default, the evaluation forms provided by this module, such as `interaction` and `examples`, discard the source locations from the expressions they evaluate. Within a `with-eval-preserve-source-locations` form, the source locations are preserved. This can be useful for documenting forms that depend on source locations, such as Redex’s typesetting macros.

Use `examples` with the `#:preserve-source-locations` option, instead.

4.5 In-Source Documentation

The `scribble/srcdoc` and `scribble/extract` libraries support writing documentation within the documented code along with an export contract, similar to using JavaDoc. With

this approach, a single contract specification is used both for the run-time contract and the documentation of an exported binding.

The scribble/srcdoc library provides forms for exporting a binding with associated documentation. The scribble/extract library is used to pull scribble/srcdoc-based documentation into a Scribble document (perhaps for multiple libraries).

Although documentation is written with a library's implementation when using scribble/srcdoc, the documentation creates no run-time overhead for the library. Similarly, typesetting the documentation does not require running the library. The two phases (run time versus documentation time) are kept separate in much the same way that the module system keeps expansion-time code separate from run-time code, and documentation information is recorded in a submodule to be separately loadable from the enclosing module.

For an example use, see this post at the Racket blog.

4.5.1 Source Annotations for Documentation

```
(require scribble/srcdoc)
```
package: scribble-lib

Documentation information generated by scribble/srcdoc forms are accumulated into a srcdoc submodule. The generated submodule is accessed by the bindings of scribble/extract.

```
(for-doc require-spec ...)
```

A require sub-form for bindings that are needed at documentation time (and documentation-expansion time, etc.) instead of run time (and expansion time, etc.). A for-doc import has no effect on a normal use of the library; it affects only documentation extraction.

Typically, a library that uses scribble/srcdoc includes at least (require (for-doc scribble/base scribble/manual)) to get core Racket forms and basic Scribble functions to use in documentation expressions.

Each *require-spec* is used in a submodule relative to the enclosing submodule. To access other submodules of the enclosing module, use a module path of the form (submod ".." *name* ...).

```
(proc-doc/names id contract arg-specs (desc-expr ...))
```

```
arg-specs = ((arg-id ...) ((arg-id default-expr) ...))
          | (arg-id ...)

 contract = (-> arg ... result)
          | (->* (mandatory ...) (optional ...) result)
          | (case-> (-> arg ... result) ...)

mandatory = contract-expr
          | keyword contract-expr

 optional = contract-expr
          | keyword contract-expr
```

A `provide` sub-form that exports *id* with the contract described by *contract* just like using `contract-out`.

The `arg-spec` specifies the names of arguments and the default values, which are not normally written as part of a contract. They are combined with the contract expression to generate the description of the binding in the documentation via `defproc`. The `(`*arg-id default-expr*`)` pairs specify the names and default values of the optional arguments. If the contract supports optional arguments, then the first `arg-spec`s form must be used, otherwise the second must be used.

The *desc-expr* is a sequence of documentation-time expressions that produces prose to describe the exported binding—that is, the last part of the generated `defproc`, so the description can refer to the *arg-id*s using `racket`.

The normal `requires` of the enclosing library are effectively converted into `for-label requires` when generating documentation, so that identifiers in the *contract*s are linked to their corresponding documentation. Similarly, any binding that is available in the run-time phase of the enclosing library can be referenced in documentation prose using the `racket` form.

```
(proc-doc id contract maybe-defs (desc-expr ...))
```

```
 contract = (-> result)
          | (->i (arg ...) (opt ...) maybe-pre [id res])
          | (->i (arg ...) (opt ...) maybe-pre (values [id res] ...))
          | (->i (arg ...) (opt ...) #:rest rest [id result-expr])
          | (->d (arg ...) () maybe-pre (values [id result] ...))
          | (->d (arg ...) () maybe-pre [id result])
          | (->d (arg ...) () #:rest id rest [id result])

maybe-pre =
          | #:pre (pre-id ...) condition

maybe-defs =
          | (default-expr default-expr ...)
```

Like `proc-doc/names`, but supporting contract forms that embed argument identifiers. Only a subset of `->i` and `->d` forms are currently supported.

If the sequence of optional arguments, `(opt ...)` is empty then the `maybe-arg-desc` must be not be present. If it is non-empty, then it must have as many default expressions are there are optional arguments.

```
(thing-doc id contract-expr (desc-expr ...))
```

Like `proc-doc`, but for an export of an arbitrary value.

```
(parameter-doc id (parameter/c contract-expr) arg-id (desc-
expr ...))
```

Like `proc-doc`, but for exporting a parameter.

```
(struct*-doc struct-name
             ([field-name contract-expr-datum] ...)
             maybe-omit-constructor
             maybe-mutable maybe-non-opaque maybe-constructor
             (desc-expr ...))

maybe-omit-constructor =
                       | #:omit-constructor
```

Like `proc-doc`, but for struct declarations that use `struct`.

The *maybe-mutable*, *maybe-non-opaque*, and *maybe-constructor* options are as in `defstruct`.

```
(struct-doc struct-name
            ([field-name contract-expr-datum] ...)
            maybe-omit-constructor
            maybe-mutable maybe-non-opaque maybe-constructor
            (desc-expr ...))
```

Like `struct*-doc`, but for struct declarations that use `define-struct`.

```
(form-doc options form-datum
  maybe-grammar maybe-contracts
  (desc-expr ...))

       options = maybe-kind maybe-link maybe-id maybe-literals

    maybe-kind =
               | #:kind kind-string-expr

    maybe-link =
               | #:link-target? link-target?-expr

      maybe-id =
               | #:id id
               | #:id [id id-expr]

 maybe-literals =
               | #:literals (literal-id ...)

  maybe-grammar =
               | #:grammar ([nonterm-id clause-datum ...+] ...)

maybe-contracts =
               | #:contracts ([subform-datum contract-expr-datum]
                              ...)
```

Like `proc-doc`, but for an export of a syntactic form. If `#:id` is provided, then *id* is the exported identifier, otherwise the exported identifier is extracted from *form-datum*.

See `defform` for information on *options*, *form-datum*, *maybe-grammar*, and *maybe-contracts*.

Added in version 1.6 of package `scribble-lib`.

```
(class*-doc id super (intf-id ...) pre-flow)
```

Like `proc-doc`, but for class declarations that use `class*`.

The *id*, *super*, and *intf-id* expressions have the same meaning as in `defclass`.

Added in version 1.30 of package `scribble-lib`.

```
(class-doc id super pre-flow)
```

Like `class*-doc`, but for class declarations that use `class` omitting `interface-expr`s.

The *id*, and *super* expressions have the same meaning as in `defclass`.

Added in version 1.30 of package `scribble-lib`.

```
(begin-for-doc form ...)
```

Like to `begin-for-syntax`, but for documentation time instead of expansion time. The *form*s can refer to binding `required` with `for-doc`.

For example, a definition in `begin-for-doc` can be referenced by a *desc-expr* in `proc-doc/names`.

```
(generate-delayed-documents)
```

Causes documentation information to be recorded as a macro that is expanded (along with any `for-doc` imports) in the module that uses `include-extracted` or `provide-extracted`, instead of within (a submodule of) the module that declares the information.

Delaying document generation in this way allows `(for-doc (for-label ....))` imports that would otherwise create cyclic module dependencies.

To avoid problems with accumulated `for-doc` imports across modules, `generate-delayed-documents` declaration should appear before any `for-doc` import.

```
(require/doc require-spec ...)
```

A legacy shorthand for `(require (for-doc require-spec ...))`.

```
(provide/doc spec ...)
```

A legacy alternative to `(provide spec ...)`

4.5.2 Extracting Documentation from Source

```
(require scribble/extract)      package: scribble-lib
```

```
(include-extracted module-path)
```

Expands to a sequence of documentation forms extracted from *module-path*, which is expected to be a module that uses scribble/srcdoc (so that the module has a srcdoc submodule).

```
(provide-extracted module-path)
```

Similar to include-extracted, but the documentation is packaged and exported as exported, instead of left inline.

Use this form in combination with include-previously-extracted when documentation from a single source is to be split and typeset among multiple documentation locations. The provide-extracted form extracts the documentation once, and then include-previously-extracted form extracts documentation for specific bindings as needed.

```
(include-previously-extracted module-path regexp)
```

Similar to include-extracted, but instead of referring to the source that contains its own documentation, *module-path* refers to a module that uses provide-extracted. The include-previously-extracted form expands to documentation forms for all identifiers whose string forms match *regexp*.

4.6 BNF Grammars

```
(require scribble/bnf)
```
package: scribble-lib

The scribble/bnf library provides utilities for typesetting grammars.

For example,

```
@(let ([open @litchar{(}]
       [close @litchar{)}])
   @BNF[(list @nonterm{expr}
              @nonterm{id}
              @BNF-seq[open @kleeneplus[@nonterm{expr}] close]
              @BNF-seq[open @litchar{lambda}
                        open @kleenestar[@nonterm{id}] close
                        @nonterm{expr} close]
              @nonterm{val})
        (list @nonterm{val}
              @BNF-alt[@nonterm{number} @nonterm{primop}])
        (list @nonterm{id}
              @elem{any name except for @litchar{lambda}})])
```

produces the output

⟨*expr*⟩ ::= ⟨*id*⟩
| `(` ⟨*expr*⟩+ `)`
| `(` `lambda` `(` ⟨*id*⟩* `)` ⟨*expr*⟩ `)`
| ⟨*val*⟩
⟨*val*⟩ ::= ⟨*number*⟩ | ⟨*primop*⟩
⟨*id*⟩ ::= any name except for `lambda`

See also `racketgrammar`.

```
(BNF prod ...) → table?
  prod : (cons/c (or/c block? content?)
                 (non-empty-listof (or/c block? content?)))
```

Typesets a grammar table. Each production starts with an element (typically constructed with `nonterm`) for the non-terminal being defined, and then a list of possibilities (typically constructed with `BNF-seq`, etc.) to show on separate lines.

```
(nonterm pre-content ...) → element?
  pre-content : pre-content?
```

Typesets a non-terminal: italic in angle brackets.

```
(BNF-seq elem ...) → (or/c element? "")
  elem : content?
```

Typesets a sequence.

```
(BNF-seq-lines elems ...) → block?
  elems : (listof content?)
```

Typesets a sequence that is broken into multiple lines, where each *elems* is one line.

```
(BNF-group pre-content ...) → element?
  pre-content : pre-content?
```

Typesets a group surrounded by curly braces (so the entire group can be repeated, for example).

```
(optional pre-content ...) → element?
  pre-content : pre-content?
```

Typesets an optional element: in square brackets.

```
(kleenestar pre-content ...) → element?
  pre-content : pre-content?
```

Typesets a 0-or-more repetition.

```
(kleeneplus pre-content ...) → element?
  pre-content : pre-content?
```

Typesets a 1-or-more repetition.

```
(kleenerange n m pre-content ...) → element?
  n : any/c
  m : any/c
  pre-content : pre-content?
```

Typesets a *n*-to-*m* repetition. The *n* and *m* arguments are converted to a string using `(format "~a" n)` and `(format "~a" m)`.

```
(BNF-alt elem ...) → element?
  elem : element?
```

Typesets alternatives for a production's right-hand side to appear on a single line. The result is normally used as a single possibility in a production list for `BNF`.

```
BNF-etc : element?
```

An element to use for omitted productions or content. Renders as: ...

4.7 Compatibility Libraries

4.7.1 Compatibility Structures And Processing

`(require scribble/struct)` package: `scribble-lib`

The `scribble/struct` compatibility library mostly re-exports `scribble/core`, but using some different names (e.g., `blockquote` instead of `nested-flow`).

The following structure types and functions are re-exported directly:

```
collect-info resolve-info tag? block?
delayed-block collected-info delayed-element
part-relative-element collect-info-parents
collect-element render-element generated-tag
tag-key content->string element->string
block-width element-width
info-key? part-collected-info collect-put!
resolve-get resolve-get/tentative resolve-get/ext?
resolve-search resolve-get-keys
```

The following structure types are re-exported, but the constructors and some selectors are replaced as documented further below:

```
part paragraph table itemization compound-paragraph
element toc-element target-element toc-target-element toc-target2-
element
page-target-element redirect-target-element link-element
index-element
```

Several additional compatibility functions and structure types are also exported.

```
(make-part tag-prefix
           tags
           title-content
           style
           to-collect
           blocks
           parts)        → part?
  tag-prefix : (or/c false/c string?)
  tags : (listof tag?)
  title-content : (or/c false/c list?)
  style : any/c
  to-collect : list?
  blocks : (listof block?)
  parts : (listof part?)
```

For backward compatibility. Compared to the normal constructor for `part`, parses `style` to convert old formats to the current one. Also, if `title-content` is a list with a single item, the item by itself is stored in the resulting `part`.

```
(part-flow p) → (listof block?)
  p : part?
```

For backward compatibility. An alias for `part-blocks`.

```
(part-title-content p) → list?
  p : part?
```

For backward compatibility. Like the normal selector, but if the result would not be a list, it is coerced to one.

```
(make-versioned-part tag-prefix
                     tags
                     title-content
                     style
                     to-collect
                     blocks
                     parts
                     version)       → part?
  tag-prefix : (or/c false/c string?)
  tags : (listof tag?)
  title-content : (or/c false/c list?)
  style : any/c
  to-collect : list?
  blocks : (listof block?)
  parts : (listof part?)
  version : string?
(versioned-part? v) → boolean?
  v : any/c
```

For backward compatibility. Like `make-part`, but adds a the `document-version` style property using the given *version*. The `versioned-part?` predicate recognizes a `part` with a `document-version` property.

```
(make-unnumbered-part tag-prefix
                      tags
                      title-content
                      style
                      to-collect
                      blocks
                      parts)        → part?
  tag-prefix : (or/c false/c string?)
  tags : (listof tag?)
  title-content : (or/c false/c list?)
  style : any/c
  to-collect : list?
  blocks : (listof block?)
  parts : (listof part?)
(unnumbered-part? v) → boolean?
  v : any/c
```

For backward compatibility. Like `make-part`, but adds the `'unnumbered` style property. The `unnumbered-part?` predicate recognizes a `part` with the `'unnumbered` property.

```
(make-paragraph content) → paragraph?
  content : list?
```

For backward compatibility. Compared to the normal constructor for `paragraph`, omits a style argument. Also, if *content* is a list containing a single item, the item by itself is stored in the resulting `paragraph`.

```
(paragraph-content p) → list?
  p : paragraph?
```

For backward compatibility. Like the normal selector, but if the result would not be a list, it is coerced to one.

```
(make-styled-paragraph content style) → paragraph?
  content : list?
  style : any/c
(styled-paragraph? v) → boolean?
  v : any/c
(styled-paragraph-style p) → style?
  p : paragraph?
```

For backward compatibility. Compared to the normal constructor for `paragraph`, parses *style* to convert old formats to the current one. The `styled-paragraph?` predicate and `styled-paragraph-style` accessor are aliases for `paragraph?` and `paragraph-style`.

```
(make-omitable-paragraph content) → paragraph?
  content : list?
(omitable-paragraph? v) → boolean?
  v : any/c
```

For backward compatibility. Like `make-paragraph`, but adds the `'omitable` style property. The `omitable-paragraph?` predicate checks for a paragraph with the property.

```
(make-table style blocksss) → table?
  style : any/c
  blocksss : (listof (listof (or/c (listof block?) (one-of/c 'cont))))
```

For backward compatibility. Compared to the normal constructor for `table`, the style is converted, and each cell has a list of blocks instead of a single block. If any such list has multiple blocks, they are combined into a `nested-flow`.

```
(table-flowss table)
 → (listof (listof (or/c (listof block?) (one-of/c 'cont))))
  table : table?
```

For backward compatibility. Like `table-blockss`, but adds a list wrapper to be consistent with `make-table`.

```
(make-itemization blockss) → itemization?
  blockss : (listof (listof block?))
```

For backward compatibility. Compared to the normal constructor for `itemization`, omits a style argument.

```
(make-styled-itemization style blockss) → itemization?
  style : any/c
  blockss : (listof (listof block?))
(styled-itemization? v) → boolean?
  v : any/c
(styled-itemization-style i) → style?
  i : itemization?
```

For backward compatibility. Compared to the normal constructor for `itemization`, parses `style` to convert old formats to the current one. The `styled-itemization?` predicate is an alias for `itemization?`, and `styled-itemization-style` is an alias for `itemization-style`.

```
(make-blockquote style blocks) → nested-flow?
  style : any/c
  blocks : (listof block?)
```

For backward compatibility. Like `make-nested-flow`, but `style` is parsed to the current format.

```
(make-auxiliary-table style blocksss) → table?
  style : any/c
  blocksss : (listof (listof (or/c (listof block?) (one-of/c 'cont))))
(auxiliary-table? v) → boolean?
  v : any/c
```

For backward compatibility. Like `make-table`, but adds the `'aux` style property. The `auxiliary-table?` predicate recognizes tables with the `'aux` property.

```
(make-compound-paragraph style blocks) → compound-paragraph?
  style : any/c
  blocks : (listof block?)
```

For backward compatibility. Compared to the normal constructor for `compound-paragraph`, parses `style` to convert old formats to the current one.

```
(make-element style content) → element?
  style : any/c
  content : list?
```

```
(make-toc-element style content toc-content) → toc-element?
  style : any/c
  content : list?
  toc-content : list?
(make-target-element style content tag) → target-element?
  style : any/c
  content : list?
  tag : tag?
(make-toc-target-element style content tag) → toc-target-element?
  style : any/c
  content : list?
  tag : tag?
(make-toc-target2-element style
                          content
                          tag
                          toc-content) → toc-target2-element?
  style : any/c
  content : list?
  tag : tag?
  toc-content : content?
(make-page-target-element style content tag)
 → page-target-element?
  style : any/c
  content : list?
  tag : tag?
(make-redirect-target-element style
                              content
                              tag
                              alt-path
                              alt-anchor)
 → redirect-target-element?
  style : any/c
  content : list?
  tag : tag?
  alt-path : path-string?
  alt-anchor : string?
(make-link-element style content tag) → link-element?
  style : any/c
  content : list?
  tag : tag?
```

```
(make-index-element style
                    content
                    tag
                    plain-seq
                    entry-seq
                    desc)     → index-element?
  style : any/c
  content : list?
  tag : tag?
  plain-seq : (and/c pair? (listof string?))
  entry-seq : list?
  desc : any/c
```

For backward compatibility. Compared to the normal constructors, parses `style` to convert old formats to the current one.

```
(element? v) → boolean?
  v : any/c
(element-content e) → list?
  e : element?
(element-style e) → element-style?
  e : element?
```

For backward compatibility. A content list is treated as an element by these functions, and the result of `element-content` is always a list.

```
(make-aux-element style content) → element?
  style : any/c
  content : list?
```

For backward compatibility. Like `make-element`, but adds the `'aux` style property.

```
(make-hover-element style content text) → element?
  style : any/c
  content : list?
  text : string?
```

For backward compatibility. Like `make-element`, but adds `hover-property` containing `text` to the element's style.

```
(make-script-element style
                     content
                     type
                     script) → element?
  style : any/c
```

```
  content : list?
  type : string?
  script : (or/c path-string? (listof string?))
```

For backward compatibility. Like `make-element`, but adds `script-property` containing `type` and `script` to the element's style.

```
(struct with-attributes (style assoc)
    #:extra-constructor-name make-with-attributes)
  style : any/c
  assoc : (listof (cons/c symbol? string?))
```

For backward compatibility. Used for an `element`'s style to combine a base style with arbitrary HTML attributes. When the `style` field is itself an instance of `with-attributes`, its content is automatically flattened into the enclosing `with-attributes` when it is used (when, e.g., rendering an `element` or `paragraph`).

```
(struct target-url (addr style)
    #:extra-constructor-name make-target-url)
  addr : path-string?
  style : any/c
```

For backward compatibility. Used as a style for an `element`. The `style` at this layer is a style for the hyperlink.

```
(struct image-file (path scale)
    #:extra-constructor-name make-image-file)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?)))
  scale : real?
```

For backward compatibility. Used as a style for an `element` to inline an image. The `path` field can be a result of `path->main-collects-relative`.

```
(element->string element) → string?
  element : content?
(element->string element renderer p info) → string?
  element : content?
  renderer : any/c
  p : part?
  info : resolve-info?
```

For backward compatibility. An alias for `content->string`.

4.7.2 Compatibility Basic Functions

```
(require scribble/basic)
```
package: scribble-lib

The scribble/basic compatibility library mostly just re-exports scribble/base.

```
(span-class style-name pre-content ...) → element?
  style-name : string?
  pre-content : any/c
```

For backward compatibility. Wraps the decoded *pre-content* as an element with style *style-name*.

```
(itemize itm ... [#:style style]) → itemization?
  itm : (or/c whitespace? an-item?)
  style : (or/c style? string? symbol? #f) = #f
```

For backward compatibility. Like itemlist, but whitespace strings among the *itm*s are ignored.

5 Literate Programming

Programs written using `scribble/lp2` are simultaneously two things: a program and a document describing the program:

- When the program is run, all of the `chunk` expressions are collected and stitched together into a program, and the rest of the module is discarded.
- When the program is provided to Scribble—or used through `include-section` in another Scribble document with a `(submod ... doc)` module path—the entire contents of the module are treated like an ordinary Scribble document, where `chunk`s are typeset in a manner similar to `codeblock`.

For example, consider this program:

```
#lang scribble/lp2
@(require scribble/manual)

Literate programs have chunks of code, like this one:

@chunk[<f>
       (define (f x)
         <fs-body>)]

and this one:

@chunk[<fs-body>
       (* x x)]

that, when assembled, produce a complete program, in this case:

@racketblock[(define (f x)
               (* x x))]
```

When this file is `required` in the normal manner, it defines a function `f` that squares its argument, and the documentation is ignored. When it is rendered as a Scribble document, the output looks like this:

> Literate programs have chunks of code, like this one:
>
> *<f>* **::=**

```
(define (f x)
  <fs-body>)
```

and this one:

<fs-body> **::=**

```
(* x x)
```

that, when assembled, produce a complete program, in this case:

```
(define (f x)
  (* x x))
```

5.1 scribble/lp2 Language

```
#lang scribble/lp2
```
package: scribble-lib

The scribble/lp language provides core support for literate programming. It is read like a scribble/base program, but its bindings extend scribble/base with two forms: chunk and CHUNK.

More precisely, a module in scribble/lp2 has its scribble/base-like content in a doc submodule, which is recognized by tools such as raco scribble. The content of the chunk and CHUNK forms is stitched together as the immediate content of the module.

The chunk and CHUNK content is discovered by first expanding the module as written. The content is collected into a new module, and then the original module content is placed into a doc submodule that is expanded (so that the content is effectively re-expanded). The doc submodule is declared with module*.

To include a scribble/lp2 document named "file.scrbl" into another Scribble document, import the doc submodule:

```
@include-section[(submod "file.scrbl" doc)]
```

Added in version 1.8 of package scribble-lib.
Changed in version 1.17: Declared the doc submodule with module* instead of module.

```
(chunk id form ...)
```

Introduces a chunk, binding *id* for use in other chunks. Normally, *id* starts with < and ends

with >.

When running the enclosing program, only the code inside the chunks is run; the rest is ignored.

If *id* is <*>, then this chunk is used as the main chunk in the file. If <*> is never used, then the first chunk in the file is treated as the main chunk. If some chunk is not referenced from the main chunk (possibly indirectly via other chunks that the main chunk references), then it is not included in the program and thus is not run.

The *form*s are typeset using racketblock, so code:comment, etc., can be used to adjust the output. Those output-adjusting forms are stripped from each *form* for running the program.

Changed in version 1.17 of package scribble-lib: Strip code:comment, etc., for running.

```
(CHUNK id form ...)
```

Like chunk, but typesets with RACKETBLOCK, so unsyntax can be used normally in each *form*. To escape, use UNSYNTAX.

5.2 scribble/lp Language

#lang scribble/lp package: scribble-lib

Programs written using the older scribble/lp language are similar to scribble/lp2 programs, except that the module cannot be provided directly to Scribble. Instead, the document content must be extracted using lp-include.

The scribble/lp language effectively binds only chunk and CHUNK, while all other bindings for documentation are taken from the context where lp-include is used.

5.3 scribble/lp-include Module

(require scribble/lp-include) package: scribble-lib

The scribble/lp-include library is normally used within a Scribble document—that is, a module that starts with something like #lang scribble/base or #lang scribble/manual, instead of #lang racket.

```
(lp-include filename)
```

Includes the source of *filename* as the typeset version of the literate program.

6 Low-Level Scribble API

6.1 Scribble Layers

Scribble is made of independently usable parts. For example, the Scribble reader can be used in any situation that requires lots of free-form text. You can also skip Scribble's special reader support, and instead use the document-generation structure directly.

6.1.1 Typical Composition

A Scribble document normally starts

```
#lang scribble/manual
```

but it could also start

```
#lang scribble/base
```

or

```
#lang scribble/doc
```

The last one introduces the smallest number of typesetting bindings in the document body. Using `scribble/base` after `#lang` is the same as using `scribble/doc` plus `(require scribble/base)`, and using `scribble/manual` after `#lang` is the same as using `scribble/doc` plus `(require scribble/manual)`.

Besides making the file a module, each of the `#lang` declarations selects the Scribble reader (instead of the usual Racket reader), and it starts the body of the file in "text" mode. The reader layer mostly leaves text alone, but @-forms escape to S-expression mode.

A module written as

```
#lang scribble/doc
@(require scribble/manual)

@(define to-be "To Be")

@title{@|to-be| or Not @|to-be|}

@bold{That} is the question.
Whether 'tis nobler...
```

reads as

```
(module ⟨name⟩ scribble/doc
  (require scribble/manual)
  "\n"
  (define to-be "To Be") "\n"
  "\n"
  (title to-be " or Not " to-be) "\n"
  "\n"
  (bold "That") " is the question." "\n"
  "Whether 'tis nobler..." "\n")
```

As shown in this example, the read result is a module whose content mingles text and definitions. The `scribble/doc` language lifts definitions, `requires`, and `provides` to the beginning of the module, while everything else is collected into a document bound to the provided identifier `doc`. That is, the module is transformed to something like this:

```
(module ⟨name⟩ racket/base
  (require scribble/decode
           scribble/manual)
  (define to-be "To Be")
  (define doc
    (decode
     "\n" "\n" "\n"
     (title to-be " or Not " to-be) "\n"
     "\n"
     (bold "That") " is the question." "\n"
     "Whether 'tis nobler..." "\n"))
  (provide doc))
```

The `decode` function produces a `part` structure instance that represents the document. To build the `part` instance, it inspects its arguments to find a `title-decl` value created by `title` to name the part, `part-start` values created by `section` to designate sub-parts, etc.

A `part` is the input to a rendering back-end, such as the HTML renderer. All renderers recognize a fixed structure hierarchy: the content of a part is a *flow*, which is a sequence of *flow elements*, such as paragraphs and tables; a table, in turn, consists of a list of list of flows; a paragraph is a list of *elements*, which can be instances of the `element` structure type, plain strings, or certain special symbols.

The value bound to `doc` in the example above is something like

```
(make-part ....
           (list "To Be" " or Not " "To Be") ; title
           ....
```

```
(make-flow
  (list
   (make-paragraph
    (list (make-element 'bold (list "That"))
          " is the question." "\n"
          "Whether " 'rsquo "tis nobler..."))))
....)
```

Notice that the `'` in the input's `'tis` has turned into `'rsquo` (rendered as a curly apostrophe). The conversion to use `'rsquo` was performed by `decode` via `decode-flow` via `decode-paragraph` via `decode-content` via `decode-string`.

In contrast, `(make-element 'bold (list "That"))` was produced by the `bold` function. The `decode` operation is a function, not a syntactic form, and so `bold` has control over its argument before `decode` sees the result. Also, decoding traverses only immediate string arguments.

As it turns out, `bold` also decodes its argument, because the `bold` function is implemented as

```
(define (bold . strs)
  (make-element 'bold (decode-content strs)))
```

The `verbatim` function, however, does not decode its content, and instead typesets its text arguments directly.

A document module can construct elements directly using `make-element`, but normally functions like `bold` and `verbatim` are used to construct them. In particular, the `scribble/manual` library provides many functions and forms to typeset elements and flow elements.

The `part` structure hierarchy includes built-in element types for setting hyperlink targets and references. Again, this machinery is normally packaged into higher-level functions and forms, such as `secref`, `defproc`, and `racket`.

6.1.2 Layer Roadmap

Working roughly from the bottom up, the Scribble layers are:

- `scribble/reader`: A reader that extends the syntax of Racket with @-forms for conveniently embedding a mixin of text and escapes. See §2 "@ Syntax".
- `scribble/core`: A set of document datatypes and utilities that define the basic layout and processing of a document. For example, the `part` datatype is defined in this layer. See §6.3 "Structures And Processing".

- scribble/base-render with scribble/html-render, scribble/latex-render, or scribble/text-render: A base renderer and mixins that generate documents in various formats from instances of the scribble/struct datatypes. See §6.4 “Renderers”.

- scribble/decode: Processes a stream of text, section-start markers, etc. to produce instances of the scribble/core datatypes. See §6.5 “Decoding Text”.

- scribble/doclang: A language to be used for the initial import of a module; processes the module top level through scribble/decode, and otherwise provides all of racket/base. See §6.6 “Document Language”.

- scribble/doc: A language that combines scribble/reader with scribble/doclang. See §6.7 “Document Reader”.

- scribble/base: A library of basic document operators—such as title, section, and secref—for use with scribble/decode and a renderer. This library name also can be used as a language, where it combines scribble/doc with the exports of scribble/base. See §3.1 “Base Document Format”.

- scribble/racket: A library of functions for typesetting Racket code. See §4.3 “Racket”. These functions are not normally used directly, but instead used through scribble/manual.

- scribble/manual: A library of functions for writing Racket documentation; reexports scribble/base. Also, the scribble/manual-struct library provides types for index-entry descriptions created by functions in scribble/manual. See §4.2 “Manual Forms”.

- scribble/example: A library of functions for evaluating code at document-build time, especially for showing examples. See §4.4 “Evaluation and Examples”.

- scribble/bnf: A library of support functions for writing grammars. See §4.6 “BNF Grammars”.

- scribble/xref: A library of support functions for using cross-reference information, typically after a document is rendered (e.g., to search). See §6.8 “Cross-Reference Utilities”.

- scribble/text: A language that uses scribble/reader preprocessing text files.

The scribble command-line utility generates output with a specified renderer. More specifically, the executable installs a renderer, loads the modules specified on the command line, extracts the doc export of each module (which must be an instance of part), and renders each—potentially with links that span documents.

6.2 @ Reader Internals

6.2.1 Using the @ Reader

You can use the reader via Racket's `#reader` form:

```
#reader scribble/reader @foo{This is free-form text!}
```

or use the `at-exp` meta-language as described in §6.2.3 "Adding @-expressions to a Language".

Note that the Scribble reader reads @-forms as S-expressions. This means that it is up to you to give meanings for these expressions in the usual way: use Racket functions, define your functions, or require functions. For example, typing the above into `racket` is likely going to produce a "reference to undefined identifier" error, unless `foo` is defined. You can use `string-append` instead, or you can define `foo` as a function (with variable arity).

A common use of the Scribble @-reader is when using Scribble as a documentation system for producing manuals. In this case, the manual text is likely to start with

```
#lang scribble/doc
```

which installs the @ reader starting in "text mode," wraps the file content afterward into a Racket module where many useful Racket and documentation related functions are available, and parses the body into a document using `scribble/decode`. See §6.7 "Document Reader" for more information.

Another way to use the reader is to use the `use-at-readtable` function to switch the current readtable to a readtable that parses @-forms. You can do this in a single command line:

```
racket -ile scribble/reader "(use-at-readtable)"
```

6.2.2 Syntax Properties

The Scribble reader attaches properties to syntax objects. These properties might be useful in some rare situations.

Forms that Scribble reads are marked with a `'scribble` property, and a value of a list of three elements: the first is `'form`, the second is the number of items that were read from the datum part, and the third is the number of items in the body part (strings, sub-forms, and escapes). In both cases, a `0` means an empty datum/body part, and `#f` means that the corresponding part was omitted. If the form has neither parts, the property is not attached to the result. This property can be used to give different meanings to expressions from the datum and the body parts, for example, implicitly quoted keywords:

```
(define-syntax (foo stx)
  (let ([p (syntax-property stx 'scribble)])
    (printf ">>> ~s\n" (syntax->datum stx))
    (syntax-case stx ()
      [(_ x ...)
       (and (pair? p) (eq? (car p) 'form) (even? (cadr p)))
       (let loop ([n (/ (cadr p) 2)]
                  [as '()]
                  [xs (syntax->list #'(x ...))])
         (if (zero? n)
           (with-syntax ([attrs (reverse as)]
                         [(x ...) xs])
             #'(list 'foo `attrs x ...))
           (loop (sub1 n)
                 (cons (with-syntax ([key (car xs)]
                                     [val (cadr xs)])
                         #'(key ,val))
                       as)
                 (cddr xs))))])))

> @foo[x 1 y (* 2 3)]{blah}
>>> (foo x 1 y (* 2 3) "blah")
'(foo ((x 1) (y 6)) "blah")
```

In addition, the Scribble parser uses syntax properties to mark syntax items that are not physically in the original source — indentation spaces and newlines. Both of these will have a `'scribble` property; an indentation string of spaces will have `'indentation` as the value of the property, and a newline will have a `'(newline S)` value where `S` is the original newline string including spaces that precede and follow it (which includes the indentation for the following item). This can be used to implement a verbatim environment: drop indentation strings, and use the original source strings instead of the single-newline string. Here is an example of this.

```
(define-syntax (verb stx)
  (syntax-case stx ()
    [(_ cmd item ...)
     #`(cmd
        #,@(let loop ([items (syntax->list #'(item ...))])
             (if (null? items)
               '()
               (let* ([fst  (car items)]
                      [prop (syntax-property fst 'scribble)]
                      [rst  (loop (cdr items))])
                 (cond [(eq? prop 'indentation) rst]
                       [(not (and (pair? prop)
                                  (eq? (car prop) 'newline)))
```

```
                        (cons fst rst)]
                       [else (cons (datum->syntax-object
                                    fst (cadr prop) fst)
                                   rst)])))))]))
```

```
> @verb[string-append]{
    foo
      bar
  }
"foo\n  bar"
```

6.2.3 Adding @-expressions to a Language

```
#lang at-exp
```
package: at-exp-lib

The at-exp language installs @-reader support in the readtable used to read a module, and then chains to the reader of another language that is specified immediately after at-exp.

For example, #lang at-exp racket/base adds @-reader support to racket/base, so that

```
#lang at-exp racket/base

(define (greet who) @string-append{Hello, @|who|.})
(greet "friend")
```

reports "Hello, friend.".

In addition to configuring the reader for a module body, at-exp attaches a run-time configuration annotation to the module, so that if it used as the main module, the current-read-interaction parameter is adjusted to use the @-reader readtable extension.

Changed in version 1.2 of package at-exp-lib: Added current-read-interaction run-time configuration.

6.2.4 Interface

```
(require scribble/reader)
```
package: at-exp-lib

The scribble/reader module provides direct Scribble reader functionality for advanced needs.

```
(read [in]) → any
  in : input-port? = (current-input-port)
```

```
(read-syntax [source-name in]) → (or/c syntax? eof-object?)
  source-name : any/c = (object-name in)
  in : input-port? = (current-input-port)
```

Implements the Scribble reader using the readtable produced by

```
(make-at-readtable #:command-readtable 'dynamic
                   #:datum-readtable 'dynamic)
```

Changed in version 1.1 of package `at-exp-lib`: Changed to use `'dynamic` for the command and datum readtables.

```
(read-inside [in]) → any
  in : input-port? = (current-input-port)
(read-syntax-inside [source-name
                     in
                     #:command-char command-char])
 → (or/c syntax? eof-object?)
  source-name : any/c = (object-name in)
  in : input-port? = (current-input-port)
  command-char : char? = #\@
```

Like `read` and `read-syntax`, but starting as if inside a `@{...}` to return a (syntactic) list, which is useful for implementing languages that are textual by default.

The given *command-char* is used to customize the readtable used by the reader, effectively passing it along to `make-at-readtable`.

Changed in version 1.1 of package `at-exp-lib`: Changed to use `'dynamic` for the command and datum readtables.

```
(make-at-readtable [#:readtable readtable
                    #:command-char command-char
                    #:command-readtable command-readtable
                    #:datum-readtable datum-readtable
                    #:syntax-post-processor syntax-post-proc])
 → readtable?
  readtable : readtable? = (current-readtable)
  command-char : char? = #\@
  command-readtable : (or/c readtable? 'dynamic) = readtable
  datum-readtable : (or/c readtable?                    = #t
                          boolean?
                          (readtable? . -> . readtable?)
                          'dynamic)
  syntax-post-proc : (syntax? . -> . syntax?) = values
```

Constructs an @-readtable. The keyword arguments can customize the resulting reader in several ways:

- *readtable* — a readtable to base the @-readtable on.
- *command-char* — the character used for @-forms.
- *command-readtable* — determines the readtable that is extended for reading the command part of an @-form:
  - a readtable — extended to make `|` a delimiter instead of a symbol-quoting character
  - `'dynamic` — extends `(current-readtable)` at the point where a command is parsed to make `|` a delimiter
- *datum-readtable* — the readtable used for reading the datum part of an @-form:
  - `#t` — uses the constructed @-readtable itself
  - a readtable — uses the given readtable
  - a readtable-to-readtable function — called to construct a readtable from the generated @-readtable
  - `'dynamic` — uses `(current-readtable)` at the point where the datum part is parsed

  The idea is that you may want to have completely different uses for the datum part, for example, introducing a convenient `key=val` syntax for attributes.
- *syntax-post-proc* — function that is applied on each resulting syntax value after it has been parsed (but before it is wrapped quoting punctuations). You can use this to further control uses of @-forms, for example, making the command be the head of a list:

```
(use-at-readtable
  #:syntax-post-processor
  (lambda (stx)
    (syntax-case stx ()
      [(cmd rest ...) #'(list 'cmd rest ...)]
      [else (error "@ forms must have a body")])))
```

Changed in version 1.1 of package `at-exp-lib`: Added `#:command-readtable` and the `'dynamic` option for `#:datum-readtable`.

```
(make-at-reader #:syntax? syntax?
                #:inside? inside? ...) → procedure?
  syntax? : #t
  inside? : #f
```

Constructs a variant of a @-readtable. The arguments are the same as in `make-at-readtable`, with two more that determine the kind of reader function that will be created: *`syntax?`* chooses between a `read`- or `read-syntax`-like function, and *`inside?`* chooses a plain reader or an `-inside` variant.

The resulting function has a different contract and action based on these inputs. The expected inputs are as in `read` or `read-syntax` depending on *`syntax?`*; the function will read a single expression or, if *`inside?`* is true, the whole input; it will return a syntactic list of expressions rather than a single one in this case.

Note that *`syntax?`* defaults to `#t`, as this is the more expected common case when you're dealing with concrete-syntax reading.

Note that if *`syntax?`* is true, the `read`-like function is constructed by simply converting a syntax result back into a datum.

`(use-at-readtable ...)` → `void?`

Passes all arguments to `make-at-readtable`, and installs the resulting readtable using `current-readtable`. It also enables line counting for the current input-port via `port-count-lines!`.

This is mostly useful for playing with the Scribble syntax on the REPL.

6.3 Structures And Processing

`(require scribble/core)` package: `scribble-lib`

A document is represented as a part, as described in §6.3.1 "Parts, Flows, Blocks, and Paragraphs". This representation is intended to be independent of its eventual rendering, and it is intended to be immutable; rendering extensions and specific data in a document can collude arbitrarily, however.

A document is processed in four passes:

- The *traverse pass* traverses the document content in document order so that information from one part of a document can be communicated to other parts of the same document. The information is transmitted through a symbol-keyed mapping that can be inspected and extended by `traverse-element`s, `traverse-block`s, and `traverse-part`s in the document. The traverse pass iterates the traversal until it obtains a fixed point (i.e., the mapping from one iteration is unchanged from the previous iteration).
- The *collect pass* globally collects information in the document that can span documents that are built at separate times, such as targets for hyperlinking.

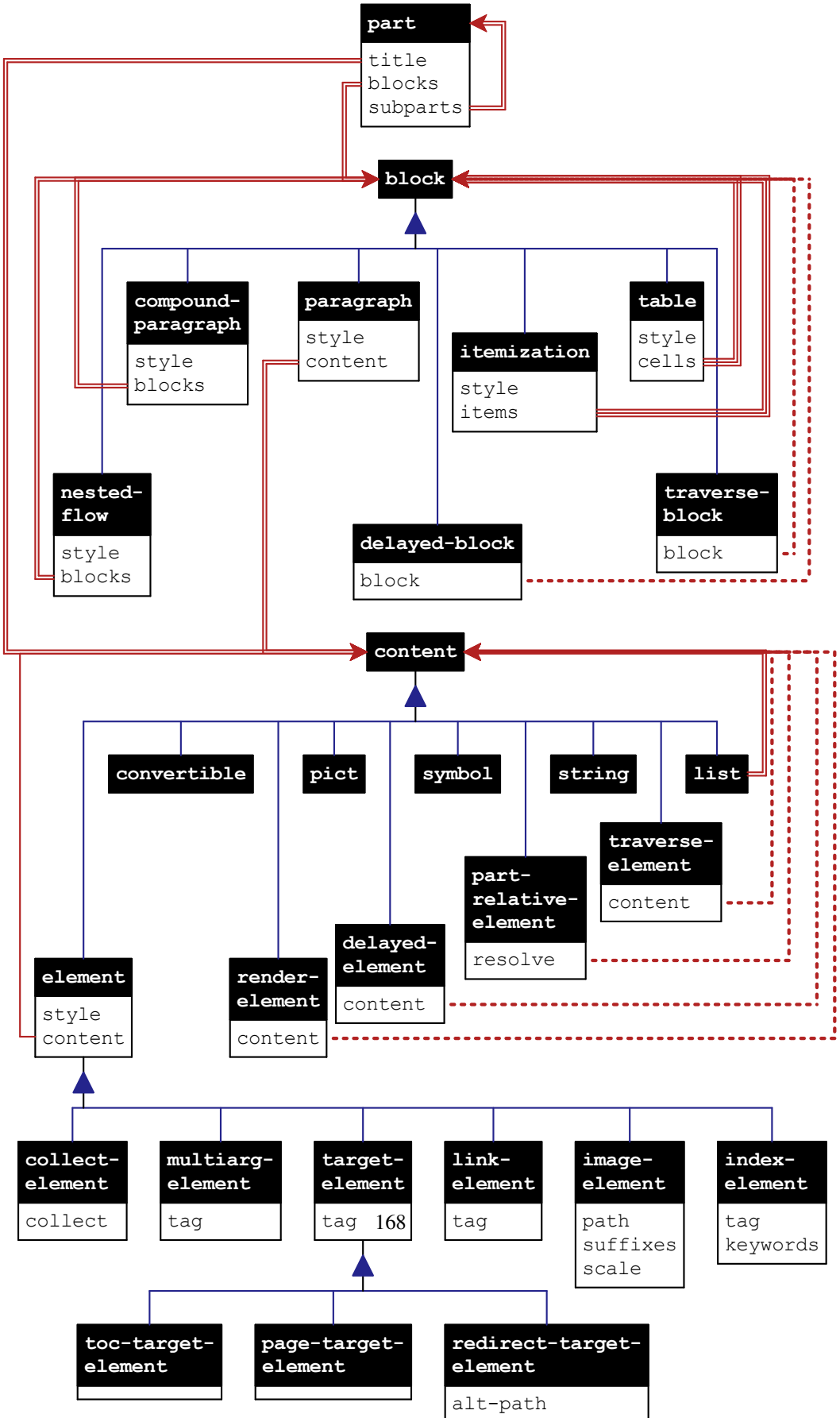
- The *resolve pass* matches hyperlink references with targets and expands delayed elements (where the expansion should not contribute new hyperlink targets).
- The *render pass* generates the result document.

None of the passes mutate the document representation. Instead, the traverse pass, collect pass, and resolve pass accumulate information in a side hash table, `collect-info` table, and `resolve-info` table, except that `traverse-part`s are replaced just after the traverse pass by rebuilding enclosing `part` structures. The collect pass and resolve pass are effectively specialized version of traverse pass that work across separately built documents.

6.3.1 Parts, Flows, Blocks, and Paragraphs

This diagram shows the large-scale structure of the type hierarchy for Scribble documents. A box represents a struct or a built-in Racket type; for example `part` is a struct. The bottom portion of a box shows the fields; for example `part` has three fields, `title`, `blocks`, and `subparts`. The substruct relationship is shown vertically with navy blue lines connected by a triangle; for example, a `compound-paragraph` is a `block`. The types of values on fields are shown via dark red lines in the diagram. Doubled lines represent lists and tripled lines represent lists of lists; for example, the `blocks` field of `compound-paragraph` is a list of `blocks`. Dotted lists represent functions that compute elements of a given field; for example, the `block` field of a `traverse-block` struct is a function that computes a `block`.

The diagram is not completely accurate: a `table` may have `'cont` in place of a block in its `cells` field, and the types of fields are only shown if they are other structs in the diagram. A prose description with more detail follows the diagram.


part
title
blocks
subparts
block
compound-paragraph
style
blocks
paragraph
style
content
itemization
style
items
table
style
cells
nested-flow
style
blocks
delayed-block
block
traverse-block
block
content
convertible
pict
symbol
string
list
traverse-element
content
part-relative-element
resolve
delayed-element
content
element
style
content
render-element
content
collect-element
collect
multiarg-element
tag
target-element
tag
link-element
tag
image-element
path
suffixes
scale
index-element
tag
keywords
toc-target-element
page-target-element
redirect-target-element
alt-path

A *part* is an instance of `part`; among other things, it has a title content, an initial flow, and a list of subsection parts. There is no difference between a part and a full document; a particular source module just as easily defines a subsection (incorporated via `include-section`) as a document.

A *flow* is a list of blocks.

A *block* is either a table, an itemization, a nested flow, a paragraph, a compound paragraph, a traverse block, or a delayed block.

- A *table* is an instance of `table`; it has a list of list of blocks corresponding to table cells.
- A *itemization* is an instance of `itemization`; it has a list of flows.
- A *nested flow* is an instance of `nested-flow`; it has a flow that is typeset as sub-flow.
- A *paragraph* is an instance of `paragraph`; it has a content:
  - A *content* can be a string, one of a few symbols, a convertible value in the sense of `convertible?`, an instance of `element` (possibly `link-element`, etc.), a `multiarg-element`, a traverse element, a part-relative element, a delayed element, or a list of content.
    * A string is included in the result document verbatim, except for space, and unless the content's enclosing style is `'hspace`. In a style other than `'hspace`, consecutive spaces in the output may be collapsed togther or replaced with a line break. In the style `'hspace`, all text is converted to uncollapsible spaces that cannot be broken across lines.
    * A symbol content is either `'mdash`, `'ndash`, `'ldquo`, `'rdquo`, `'lsquo`, `'rsquo`, `'lang`, `'rang`, `'larr`, `'rarr`, `'nbsp`, `'prime`, `'alpha`, or `'infin`; it is rendered as the corresponding HTML entity (even for other output formats, such as Latex or Typst).
    * A convertible value in the sense of `convertible?` is used in a renderer-specific way, but values convertible to `'text` renders the same as the resulting string. If a renderer is not able to convert the value to a known format, the value is converted to a string using `write`.
    * An instance of `element` has a content plus a style. The style's interpretation depends on the renderer, but it can be one of a few special symbols (such as `'bold`) that are recognized by all renderers.
    * An instance of `link-element` has a tag for the target of the link.
    * An instance of `target-element` has a tag to be referenced by `link-element`s. An instance of the subtype `toc-target-element` is treated like a kind of section label, to be shown in the "on this page" table for HTML output.
    * An instance of `index-element` has a tag (as a target), a list of strings for the keywords (for sorting and search), and a list of contents to appear in the end-of-document index.

  - An instance of `image-element` incorporates an image from a file into the rendered document.
  - An instance of `multiarg-element` combines a style with a list of content, where the style corresponds to a rendered command that takes multiple arguments.
  - An instance of `collect-element` has a procedure that is called in the collect pass of document processing to record information used by later passes.
  - A *traverse element* is an instance of `traverse-element`, which ultimately produces content, but can accumulate and inspect information in the traverse pass.
  - A *part-relative element* is an instance of `part-relative-element`, which has a procedure that is called in the collect pass of document processing to obtain *content*. When the part-relative element's procedure is called, collected information is not yet available, but information about the enclosing parts is available.
  - A *delayed element* is an instance of `delayed-element`, which has a procedure that is called in the resolve pass of document processing to obtain *content*.
  - An instance of `render-element` has a procedure that is called in the render pass of document processing.

- A *compound paragraph* is an instance of `compound-paragraph`; like `blockquote`, it has list of blocks, but the blocks are typeset as a single paragraph (e.g., no indentation after the first block) instead of inset.

- A *traverse block* is an instance of `traverse-block`, which ultimately produces another block, but can accumulate and inspect information during the traverse pass.

- A *delayed block* is an instance of `delayed-block`, which has a procedure that is called in the resolve pass of document processing to obtain a *block*.

Changed in version 1.23 of package `scribble-lib`: Changed the handling of `convertible?` values to recognize a `'text` conversion and otherwise use `write`.

6.3.2 Tags

A *tag* is a list containing a symbol and either a string, a `generated-tag` instance, or an arbitrary list. The symbol effectively identifies the type of the tag, such as `'part` for a tag that links to a part, or `'def` for a Racket function definition. The symbol also effectively determines the interpretation of the second half of the tag.

A part can have a *tag prefix*, which is effectively added onto the second item within each tag whose first item is `'part`, `'tech`, or `'cite`, or whose second item is a list that starts with `'prefixable`:

- The prefix is added to a string second item by creating a list containing the prefix and string.
- The prefix is added to a list second item after `'part`, `'tech`, or `'cite` using `cons`.
- The prefix is added to a second item that starts `'prefixable` by adding it to the list after `'prefixable`.
- A prefix is not added to a `generated-tag` item.

The prefix is used for reference outside the part, including the use of tags in the part's `tags` field. Typically, a document's main part has a tag prefix that applies to the whole document; references to sections and defined terms within the document from other documents must include the prefix, while references within the same document omit the prefix. Part prefixes can be used within a document as well, to help disambiguate references within the document.

Some procedures accept a "tag" that is just the string part of the full tag, where the symbol part is supplied automatically. For example, `section` and `secref` both accept a string "tag", where `'part` is implicit.

The `scribble/tag` library provides functions for constructing tags.

6.3.3 Styles

A *style* combines a style name with a list of style properties in a `style` structure. A *style name* is either a string, symbol, or `#f`. A *style property* can be anything, including a symbol or a structure such as `color-property`.

A style has a single style name, because the name typically corresponds to a configurable instruction to a renderer. For example, with Latex output, a string style name corresponds to a Latex command or environment. For more information on how string style names interact with configuration of a renderer, see §6.11 "Extending and Configuring Scribble Output". Symbolic style names, meanwhile, provide a simple layer of abstraction between the renderer and documents for widely supported style; for example, the `'italic` style name is supported by all renderers.

Style properties within a style compose with style names and other properties. Again, symbols are often used for properties that are directly supported by renderers. For example, `'unnumbered` style property for a part renders the part without a section number. Many properties are renderer-specific, such as a `hover-property` structure that associates text with an element to be shown in an HTML display when the mouse hovers over the text.

6.3.4 Collected and Resolved Information

The collect pass, resolve pass, and render pass processing steps all produce information that is specific to a rendering mode. Concretely, the operations are all represented as methods on a `render<%>` object.

The result of the `collect` method is a `collect-info` instance. This result is provided back as an argument to the `resolve` method, which produces a `resolve-info` value that encapsulates the results from both iterations. The `resolve-info` value is provided back to the `resolve` method for final rendering.

Optionally, before the `resolve` method is called, serialized information from other documents can be folded into the `collect-info` instance via the `deserialize-info` method. Other methods provide serialized information out of the collected and resolved records.

During the collect pass, the procedure associated with a `collect-element` instance can register information with `collect-put!`.

During the resolve pass, collected information for a part can be extracted with `part-collected-info`, which includes a part's number and its parent part (or `#f`). More generally, the `resolve-get` method looks up information previously collected. This resolve-time information is normally obtained by the procedure associated with a delayed block or delayed element.

The `resolve-get` information accepts both a `part` and a `resolve-info` argument. The `part` argument enables searching for information in each enclosing part before sibling parts.

During the collect pass and resolve pass, *part context* information is accumulated from enclosing parts. The context starts as an empty table. When a `part-tag-prefix` for a part reports a hash table, then for each key in the table, the value in the table is merged with the context from enclosing parts. A value is merged by adding the key and value to the accumulation if the key is not yet present, or by `cons`ing the new value to the context's current value when the key is present. For example, the key `'index-extras` is used to merge with an `index-desc` within a discovered `index-element`. Use `current-part-context-accumulation` during the collect pass or resolve pass to retrieve the value that has been accumulated from enclosing parts.

6.3.5 Structure Reference

```
(struct part (tag-prefix
              tags
              title-content
              style
              to-collect
              blocks
              parts)
```

```
  #:extra-constructor-name make-part)
tag-prefix : (or/c #f string? hash?)
tags : (listof tag?)
title-content : (or/c #f list?)
style : style?
to-collect : list?
blocks : (listof block?)
parts : (listof (or/c part? traverse-part?))
```

The `tag-prefix` field determines the optional tag prefix for the part and/or part context accumulation. When `tag-prefix` is a hash table, the value associated with the `'tag-prefix` key is used as the tag prefix when the value is a string. When `tag-prefix` as a hash table is used for the main part in a document rendered by `raco setup`, `raco setup` uses recognizes some keys to configure the document's rendering; see `scribblings` in §6.3 "Controlling `raco setup` with `"info.rkt"` Files" for more information.

The `tags` indicates a list of tags that each link to the section. Normally, `tags` should be a non-empty list, so that hyperlinks can target the section.

The `title-content` field holds the part's title, if any.

For the `style` field, the currently recognized symbolic style names are as follows:

- `'index` — The part represents an index.

The recognized style properties are as follows:

- `'unnumbered` — A section number is not computed or rendered for the section.
- `'hidden-number` — A section number is computed for the section, but it is not rendered as part of the section name.
- `'toc-hidden` — The part title is not shown in tables of contents, including in "on this page" boxes. For Latex and Typst rendering, the part title is omitted only if it is unnumbered or has a hidden number.
- `'hidden` — The part title is not shown; for Latex output, the part title is not shown only if its is empty, and in that case, it is also excluded from tables of contents. The `'toc-hidden` style property usually should be included with `'hidden` (for consistency in non-Latex output).
- `'grouper` — The part is numbered with a Roman numeral, by default, and its subsections continue numbering as if they appeared in the preceeding part. In other words, the part acts like a "part" in a book where chapter numbering is continuous across parts.

- numberer instance — A numberer created with `make-numberer` determines a representation of the part's section number as an extension of it's parent's number. A numberer overrides the default representation, which is a natural number or (in the case of an accompanying `'grouper` property) a Roman numeral. If a `'unnumbered` property is also present, a numberer property is ignored.

- `'toc` — Sub-parts of the part are rendered on separate pages for multi-page HTML mode.

- `'non-toc` — Initial sub-parts of the part are *not* rendered on separate pages for multi-page HTML mode; this style property applies only to the main part.

- `'reveal` — Shows sub-parts when this part is displayed in a table-of-contents panel in HTML output (which normally shows only the top-level sections).

- `'quiet` — In HTML output and most other output modes, hides entries for sub-parts of this part in a `table-of-contents` or `local-table-of-contents` listing except when those sub-parts are top-level entries in the listing.

- `'no-toc+aux` — As a style property for the main part of a rendered page, causes the HTML output to not include a margin box for the main table of contents, "on this page", or tables with the `'aux` style property. The `'no-toc+aux` property effectively implies `'no-toc` and `'no-sidebar`, but also suppresses `'aux` tables.

- `'no-toc` — As a style property for the main part of a rendered page, causes the HTML output to not include a margin box for the main table of contents; the "on this page" box that contains `toc-element` and `toc-target-element` links (and that only includes an "on this page" label for multi-page documents) takes on the location and color of the main table of contents, instead.

- `'no-sidebar` — As a style property for the main part of a document, causes the HTML output to not include an "on this page" margin box.

- `'no-navigation` — As a style property for the main part of a rendered page, causes the HTML output to not include "top," "up,", "prev," and "next" controls if they would otherwise apply.

- `'family-navigation` — As a style property for the main part of a rendered page, causes the HTML output to include "top," "up,", "prev," and "next" controls only when the viewing context indicates a language family not in the page's language families.

- `'show-language-family` — As a style property for the main part of a rendered page or any enclosing part, causes the HTML output to include an indication of the document's primary language family, as well as the language family being used to navigate documentation.

- `'no-header-controls` — Suppresses link and link-information icons (if any) as part of a section header in HTML output.

- `'no-index` — Has no effect as a style property on a `part`, but as a style property on a `title` or `part-start` that provides a `part`'s style via `decode`, the `'no-index` style property cause `decode` to skip the generation of an entry for the part's title in the document index.

- `document-version` structure — A version number for this part and its sub-parts (except as overridden). When it is not `""` may be used when rendering a document; at a minimum, a non-`""` version is rendered when it is attached to a part representing the whole document. The default version for a document is `(version)`. In rendered form, the version is normally prefixed with the word "Version," but this formatting can be controlled by overriding `.version:before` and/or `.versionNoNav:before` in CSS for HTML rendering, by redefining the `\SVersionBefore` macro for Latex rendering (see §6.11 "Extending and Configuring Scribble Output"), by redefining the `SVersion` function for Typst rendering (see §6.11 "Extending and Configuring Scribble Output").

- `document-date` structure — A date for the part, normally used on a document's main part for for Latex output. The default date for a document is `#f`, which avoids explicitly specifying a date at the Latex level, so that the current date is used as the document date. Set the date to `""` to suppress a date in an output document. For Typst, `#f` and `""` are effectively the same.

- `body-id` structure — Generated HTML uses the given string `id` attribute of the `<body>` tag; this style property can be set separately for parts that start different HTML pages, otherwise it is effectively inherited by sub-parts; the default is `"scribble-racket-lang.org"`, but `raco setup` installs `"doc-racket-lang.org"` as the `id` for any document that it builds.

- `attributes` structure — Provides additional HTML attributes for the `<html>` tag when the part corresponds to its own HTML page.

- `head-extra` structure — Provides additional HTML content for the `<head>` tag when the part corresponds to its own HTML page.

- `head-addition` structure — Like `head-extra`, but also propagated to enclosing and nested HTML pages.

- `color-property` structure — For HTML, applies a color to the part title.

- `background-color-property` structure — For HTML, applies a color to the background of the part title.

- `hover-property` structure — For HTML, adds a text label to the title to be shown when the mouse hovers over it.

- `render-convertible-as` structure — For HTML, controls how objects that subscribe to the `file/convertible` protocol are rendered.

- `document-source` structure — For HTML, provides a module path for the part's source. Clicking on an HTML section title generated for the part or its sub-parts may show the module path plus a section-tag string, so that the user can create a reference to the section.
- `link-render-style` structure — Determines the default rendering of links to sections or other destinations within the section. See also `link-element` and `current-link-render-style`.
- `part-title-and-content-wrapper` structure — For HTML, adds a tag with attributes around the part title and its content, including any content before the title from a `paragraph` with the `'pretitle` style. The wrapper is not used around a subpart that is rendered on a different HTML page.
- `part-link-redirect` structure — For HTML, redirects hyperlinks that would otherwise go to the part so that they refer to a different URL.
- `'enable-index-merge` — On an index parts or one of its enclosing parts for Latex output, causes index entries to be merged when they have the same content, with multiple references for the same entry combined with `\Smanypageref`. The `\Smanypageref` Latex macro must be redefined to accept multiple `,`-separated labels and generate a suitable set of references. See also `scriblib/book-index`.
- `initial-scale` structure — For HTML, adjusts the initial scale for responsive views, such as on mobile devices.

The `to-collect` field contains content that is inspected during the collect pass, but ignored in later passes (i.e., it doesn't directly contribute to the output).

The `blocks` field contains the part's initial flow (before sub-parts).

The `parts` field contains sub-parts. A `traverse-part` within `parts` is converted to a replacement list of `part`s just after the traverse pass.

Changed in version 1.25 of package `scribble-lib`: Added `'no-index` support.
Changed in version 1.26: Added `link-render-style` support.
Changed in version 1.27: Added `'no-toc+aux` support.
Changed in version 1.54: Changed `tag-prefix` field to allow a part context hash table.
Changed in version 1.57: Added `'no-header-controls` support.
Changed in version 1.59: Added `'no-navigation`, `'family-navigation`, and `'show-language-family` support.
Changed in version 1.67: Added `traverse-part?` as a possible contract on an element in `parts` list.

```
(struct traverse-part (traverse)
    #:extra-constructor-name make-traverse-part)
  traverse : part-traverse-procedure/c
```

Produces a replacement list of parts (possibly empty) during the traverse pass, eventually.

The traverse procedure is called with get and set procedures to get and set symbol-keyed information; the traverse procedure should return either a list of parts (which effectively takes the traverse-part's place) or a procedure like traverse to be called in the next iteration of the traverse pass.

See traverse-block for more information that applies to traverse-part, too.

Added in version 1.67 of package scribble-lib.

```
(struct paragraph (style content)
    #:extra-constructor-name make-paragraph)
  style : style?
  content : content?
```

A paragraph has a style and a content.

For the style field, a string style name corresponds to a CSS class for HTML output, a macro for Latex output, or a function for Typst output (see §6.11.1 "Implementing Styles"). The following symbolic style names are recognized:

- 'author — Typeset as the author of a document. Such paragraphs normally should appear only in the initial flow of a part for a document, where they are treated specially by the Latex and Typst renderers by moving the author information to the title.
- 'pretitle — Typeset before the title of the enclosing part.
- 'wraps — Like a #f style name, but not boxable in the sense of box-mode for Latex output.

When a paragraph's style is #f, then it is boxable in the sense of box-mode for Latex output.

The currently recognized style properties are as follows:

- 'omitable — When a table cell contains a single paragraph with the 'omitable style property, then when rendering to HTML, no <p> tag wraps the cell content.
- 'div — Generates HTML output instead of <p> (unless a alt-tag property is provided).
- alt-tag structure — Generates the indicated HTML tag instead of <p> or .
- attributes structure — Provides additional HTML attributes for the <p>, , or alternate tag.
- 'never-indents — For Latex and compound paragraphs; see compound-paragraph.

- box-mode structure — For Latex output, uses an alternate rendering form for boxing contexts (such as a table cell); see box-mode.

```
(struct table (style blockss)
    #:extra-constructor-name make-table)
  style : style?
  blockss : (listof (listof (or/c block? 'cont)))
```

See also the tabular function.

A table has, roughly, a list of list of blocks. A cell in the table can span multiple columns by using 'cont instead of a block in the following columns (i.e., for all but the first in a set of cells that contain a single block).

Within style, a string style name corresponds to a CSS class for HTML output, an environment for Latex output, or a function for Typst output that expects a columns argument before content arguments (see §6.11.1 “Implementing Styles”). The following symbolic style names are also recognized:

- 'boxed — Renders as a definition. This style name is not intended for use on a table that is nested within a 'boxed table; nested uses may look right for some renders of the style but not others.
- 'centered — Centers HTML output horizontally.
- 'block — Prevents pages breaks in Latex and Typst output.

The following style properties are currently recognized:

- table-columns structure — Provides column-specific styles, but only column-attributes properties (if any) are used if a table-cells structure is included as a style property. See table-cells for information about how a column style is used for each cell.
- table-cells structure — Provides cell-specific styles. See table-cells for information about how the styles are used.
- attributes structure — Provides additional HTML attributes for the <table> tag.
- 'aux — For HTML, include the table in the table-of-contents display for the enclosing part.
- 'never-indents — For Latex and compound paragraphs; see compound-paragraph.

For Latex output, a paragraph as a cell value is not automatically line-wrapped, unless a vertical alignment is specified for the cell through a table-cells or table-columns style property. To get a line-wrapped paragraph, use a compound-paragraph or use an element with a string style and define a corresponding Latex macro in terms of \parbox. For Latex output of blocks in the flow that are nested-flows, itemizations, compound-paragraphs, or delayed-blocks, the block is wrapped with minipage using \linewidth divided by the column count as the width.

```
(struct itemization (style blockss)
    #:extra-constructor-name make-itemization)
  style : style?
  blockss : (listof (listof block?))
```

A itemization has a style and a list of flows.

In style, a string style name corresponds to a CSS class for HTML output, a macro for Latex output, or a function name for Typst output (see §6.11.1 “Implementing Styles”). In addition, the following symbolic style names are recognized:

- 'compact — Reduces space between items.
- 'ordered — Generates <ol> HTML output instead of <ul> or an Latex or Typst enumeration instead of an itemization.

The following style properties are currently recognized:

- attributes structure — Provides additional HTML attributes for the <ul> or <ol> tag.
- 'never-indents — For Latex and compound paragraphs; see compound-paragraph.

```
(struct nested-flow (style blocks)
    #:extra-constructor-name make-nested-flow)
  style : style?
  blocks : (listof block?)
```

A nested flow has a style and a flow.

In style, the style name is normally a string that corresponds to a CSS class for HTML <blockquote> output, a Latex environment, or a Typst function name (see §6.11.1 “Implementing Styles”). The following symbolic style names are recognized:

- 'inset — Insets the nested flow relative to surrounding text.

- 'code-inset — Insets the nested flow relative to surrounding text in a way suitable for code. If the nested flow has a single block, then it is boxable in the sense of box-mode for Latex output.
- 'vertical-inset — Insets the nested flow vertically relative to surrounding text, but not horizontally. If the nested flow has a single block, then it is boxable in the sense of box-mode for Latex output.

The following style properties are currently recognized:

- 'command — For Latex output, a string style name is used as a command name instead of an environment name.
- 'multicommand — For Latex or Typst output, a string style name is used as a command or function name with a separate argument for each block in blocks.
- attributes structure — Provides additional HTML attributes for the <blockquote> tag.
- 'never-indents — For Latex and compound paragraphs; see compound-paragraph.
- box-mode structure — For Latex output, uses an alternate rendering form for boxing contexts (such as a table cell); see box-mode.
- 'decorative — The content of the nested flow is intended for decoration. Text output skips a decorative nested flow.
- alt-tag structure — Generates the indicated HTML tag instead of <blockquote>.
- 'pretitle — For Latex and Typst, raises the contents of the flow to above the title.

```
(struct compound-paragraph (style blocks)
    #:extra-constructor-name make-compound-paragraph)
  style : style?
  blocks : (listof block?)
```

A compound paragraph has a style and a list of blocks.

For HTML, a paragraph block in blocks is rendered without a <p> tag, unless the paragraph has a style with a non-#f style name. For Latex, each block in blocks is rendered with a preceding \noindent, unless the block has the 'never-indents property (checking recursively in a nested-flow or compound-paragraph if the nested-flow or compound-paragraph itself has no 'never-indents property).

The style field of a compound paragraph is normally a string that corresponds to a CSS class for HTML output, Latex environment for Latex output, or a function name for Typst output (see §6.11.1 “Implementing Styles”). The following style properties are currently recognized:

- `'command` — For Latex output, a string style name is used as a command name instead of an environment name.
- `alt-tag` structure — Generates the given HTML tag instead of <p>.
- `attributes` structure — Provides additional HTML attributes for the <p> or alternate tag.
- `'never-indents` — For Latex within another compound paragraph; see above.

```
(struct traverse-block (traverse)
    #:extra-constructor-name make-traverse-block)
  traverse : block-traverse-procedure/c
```

Produces another block during the traverse pass, eventually.

The `traverse` procedure is called with *`get`* and *`set`* procedures to get and set symbol-keyed information; the `traverse` procedure should return either a block (which effectively takes the `traverse-block`'s place) or a procedure like `traverse` to be called in the next iteration of the traverse pass.

All `traverse-element` and `traverse-block`s that have not been replaced are forced in document order relative to each other during an iteration of the traverse pass.

The *`get`* procedure passed to `traverse` takes a symbol and any value to act as a default; it returns information registered for the symbol or the given default if no value has been registered. The *`set`* procedure passed to `traverse` takes a symbol and a value to be registered for the symbol.

See also `cond-block` in `scriblib/render-cond`.

The symbol `'scribble:current-render-mode` is automatically registered to a list of symbols that describe the target of document rendering. The list contains `'html` when rendering to HTML, `'latex` when rendering via Latex, `'typst` when rendering via Typst, and `'text` when rendering to text. The registration of `'scribble:current-render-mode` cannot be changed via *`set`*.

```
(struct delayed-block (resolve)
    #:extra-constructor-name make-delayed-block)
  resolve : (any/c part? resolve-info? . -> . block?)
```

The `resolve` procedure is called during the resolve pass to obtain a normal block. The first argument to `resolve` is the renderer.

```
(struct element (style content)
    #:extra-constructor-name make-element)
  style : element-style?
  content : content?
```

Styled content within an enclosing paragraph or other content.

The `style` field can be a `style` structure, but it can also be just a style name.

In `style`, a string style name corresponds to a CSS class for HTML output, a command name for Latex output, and a functionname for Typst output (see §6.11.1 "Implementing Styles"). The following symbolic style names are recognized:

- `'tt`, `'italic`, `'bold`, `'roman`, `'sf`, `'url`, `'subscript`, `'superscript`, `'smaller`, `'larger` — Basic styles recognized by all renders.
- `'hspace` — Renders its `content` as monospace blanks.
- `'newline` — Renders a line break independent of the `content`.
- `'no-break` — Prevents line breaks when rendering `content`.

The following style properties are currently recognized:

- `target-url` structure — Generates a hyperlink.
- `url-anchor` structure — For HTML, inserts a hyperlink target before `content`.
- `color-property` structure — Applies a color to the text of `content`.
- `background-color-property` structure — Applies a color to the background of `content`.
- `alt-tag` structure — Generates the given HTML tag instead of the default one (, <b>, etc.).
- `attributes` structure — Provides additional HTML attributes for a tag.
- `hover-property` structure — For HTML, adds a text label to the content to be shown when the mouse hovers over it.
- `script-property` structure — For HTML, supplies a script alternative to `content`.
- `xexpr-property` structure — For HTML, supplies literal HTML to render before and after `content`.
- `'aux` — Intended for use in titles, where the auxiliary part of the title can be omitted in hyperlinks. See, for example, `secref`.
- `'tt-chars` — For Latex output, when the style name is a string, render the element's content with escapes suitable for Latex `tt` mode.
- `'exact-chars` — For Latex output, when the style name is a string or `#f`, render the elements content exactly (without escapes).

- command-extras structure — For Latex or Typst output, adds strings as arguments to the Latex command or Typst function. The arguments are written verbatim, and they are written as text mode for Typst.

Changed in version 1.6 of package scribble-lib: Changed 'exact-chars handling to take effect when the style name is #f.
Changed in version 1.27: Changed to support xexpr-property.

```
(struct image-element element (path suffixes scale)
    #:extra-constructor-name make-image-element)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?)))
  suffixes : (listof #rx"^[.]")
  scale : real?
```

Used as a style for an element to inline an image. The path field can be a result of path->main-collects-relative.

For each string in suffixes, if the rendered works with the corresponding suffix, the suffix is added to path and used if the resulting path refers to a file that exists. The order in suffixes determines the order in which suffixes are tried. The HTML renderer supports ".png", ".gif", and ".svg", while the Latex renderer supports ".png", ".pdf", and ".ps" (but rendering Latex output to PDF will not work with ".ps" files, while rendering to Latex DVI output works only with ".ps" files). If suffixes is empty or if none of the suffixes lead to files that exist, path is used as-is.

The scale field scales the image in its rendered form.

```
(struct target-element element (tag)
    #:extra-constructor-name make-target-element)
  tag : tag?
```

Declares the content as a hyperlink target for *tag*.

```
(struct toc-target-element target-element ()
    #:extra-constructor-name make-toc-target-element)
```

Like target-element, the content is also a kind of section label to be shown in the "on this page" table for HTML output.

```
(struct toc-target2-element toc-target-element (toc-content)
    #:extra-constructor-name make-toc-target2-element)
  toc-content : content?
```

Extends target-element with a separate field for the content to be shown in the "on this page" table for HTML output.

```
(struct page-target-element target-element ()
    #:extra-constructor-name make-page-target-element)
```

Like `target-element`, but a link to the element goes to the top of the containing page.

```
(struct redirect-target-element target-element (alt-path
                                                alt-anchor)
    #:extra-constructor-name make-redirect-target-element)
  alt-path : path-string?
  alt-anchor : string?
```

Like `target-element`, but a link to the element is redirected to the given URL.

```
(struct toc-element element (toc-content)
    #:extra-constructor-name make-toc-element)
  toc-content : content?
```

Similar to `toc-target-element`, but with specific content for the "on this page" table specified in the `toc-content` field.

```
(struct link-element element (tag)
    #:extra-constructor-name make-link-element)
  tag : tag?
```

Represents a hyperlink to *tag*.

Normally, the content of the element is rendered as the hyperlink. When *tag* is a part tag and the content of the element is `null`, however, rendering is treated specially based on the *mode* value of a `link-render-style` style property:

- For HTML output, in the `'default` mode, the generated reference is the hyperlinked title of the elements in the section's title content, except that elements with the `'aux` style property are omitted in the hyperlink label.

  In `'number` mode, the section title is not shown. Instead, the word "section" is shown followed by a hyperlinked section number. The word "section" starts in uppercase if the element's style includes a `'uppercase` property.

  In `'short` mode, only the section number is shown, as "§3.2", the whole thing (symbol and number together) hyperlinked as a unit — no word, no title.

  In `'number-and-title` mode, both the number and the title are shown together, hyperlinked as a unit: the section number (if the section has one), the symbol "§", and the section title in quotes — e.g., "§3.2 "Some Section"".

  For both `'short` and `'number-and-title`, a section with no number (e.g., an `'unnumbered` part) falls back instead to just the title, with no "§" or number: quoted for `'number-and-title`, plain for `'short`.

- For Latex/PDF output, the generated reference's format can depend on the document style in addition the *mode*, for the 'default and 'number modes. For the 'default mode and a default document style, a section number is shown by the word "section" followed by the section number, and the word "section" and the section number are together hyperlinked. The word "section" starts in uppercase if the element's style includes a 'uppercase property. The scribble/manual style uses the symbol "§" in place of the word "section".

  In 'number mode, rendering is the same, except that only the number is hyperlinked, not the word "section" or the "§" symbol.

  A new document style can customize this part of Latex/PDF output (see §6.11 "Extending and Configuring Scribble Output") by redefining the \SecRefLocal, etc., macros (see §6.11.5 "Latex Commands"). The \SecRef, etc., variants are used in 'number mode.

  The 'short and 'number-and-title modes render the same way as they do for HTML (described above), *regardless* of the document style: they bypass the \SecRefLocal macro family entirely, so a document style cannot customize their appearance by redefining those macros.

If a link-render-style style property is not attached to a link-element that refers to a part, a link-render-style style property that is attached to an enclosing part is used, since attaching a link-render-style style property to a part causes current-link-render-style to be set while rendering the part. Otherwise, the render-time value of current-link-render-style determine's a link-element's rendering.

The following style properties are recognized in addition to the style properties for all elements:

- link-render-style structure — As described above.
- 'indirect-link — For HTML output, treats the link as "external". When rendering to HTML and the set-external-tag-path method is called to provide an external-link URL, then the resolution of the hyperlink can be deferred until the link is clicked (or, in some cases, patched by JavaScript when the documentation is viewed in a browser).

  Note that deferred resolution relies on cooperation with the page pointed to by the external-link URL, and arbitrary tags are not supported. Functions and forms like seclink, other-doc, racketmodname, tech, and techlink provide higher-level interfaces for creating supported kinds of indirect links.
- link-query-addition structure — Adds query parameters to the link.

Changed in version 1.26 of package scribble-lib: Added link-render-style support.
Changed in version 1.65: Added link-query-addition support.
Changed in version 1.69: Added the 'short and 'number-and-title modes.

```
(struct index-element element (tag plain-seq entry-seq desc)
    #:extra-constructor-name make-index-element)
  tag : tag?
  plain-seq : (and/c pair? (listof string?))
  entry-seq : (listof content?)
  desc : any/c
```

The plain-seq specifies the keys for sorting, where the first string is the main key, the second is a sub-key, etc. For example, an "night" portion of an index might have sub-entries for "night, things that go bump in" and "night, defender of the". The former would be represented by plain-seq '("night" "things that go bump in"), and the latter by '("night" "defender of the"). Naturally, single-string plain-seq lists are the common case, and at least one word is required, but there is no limit to the word-list length. The strings in plain-seq must not contain a newline character.

The entry-seq list must have the same length as plain-seq. It provides the form of each key to render in the final document.

The desc field provides additional information about the index entry as supplied by the entry creator. For example, a reference to a procedure binding can be recognized when desc is an instance of exported-index-desc* with the '("procedure") kind. See scribble/manual-struct for other types of desc values, but generally index-desc or exported-index-desc* should be used. A delayed-index-desc is also recognized, and its resolve function is called during the to provide the index entry's description (which should normally produce a index-desc or exported-index-desc*).

When desc is index-desc, exported-index-desc, or exported-index-desc*, and when part context is accumulated for 'index-extras, the accumulated context is merged with the extras field of desc (after promoting exported-index-desc to exported-index-desc* with an empty extras hash table). An accumulated 'index-extras contribution should be a cons tree of hash tables, which are processed in order so that a subpart takes precedence over its enclosing part. For each accumulated table, if a key in the table is not present in extras table, it is added with its value to the table. These additions are performed as an index entry is recorded during the collect pass or resolve pass (the latter for a delayed-index-desc).

See also index.

```
(struct multiarg-element (style contents)
    #:extra-constructor-name make-multiarg-element)
  style : element-style?
  contents : (listof content?)
```

Like element with a list for content, except that for Latex or Typst output, if the style name in style is a string, then it corresponds to a Latex command or Typst function that accepts

as many arguments (each in curly braces for Latex or square brackets for Typst) as elements of `contents`.

```
(struct traverse-element (traverse)
    #:extra-constructor-name make-traverse-element)
  traverse : element-traverse-procedure/c
```

Like `traverse-block`, but the `traverse` procedure must eventually produce content, rather than a block.

See also `cond-element` in `scriblib/render-cond`.

```
(struct delayed-element (resolve sizer plain)
    #:extra-constructor-name make-delayed-element)
  resolve : (any/c part? resolve-info? . -> . content?)
  sizer : (-> any/c)
  plain : (-> any/c)
```

The `resolve` procedure's arguments are the same as for `delayed-block`, but the result is content. Unlike `delayed-block`, the result of the `resolve` procedure's argument is remembered on the first call for re-use for a particular resolve pass.

The `sizer` field is a procedure that produces a substitute content for the delayed element for the purposes of determining the delayed element's width (see `element-width`).

The `plain` field is a procedure that produces a substitute content when needed before the collect pass, such as when `element->string` is used before the collect pass.

```
(struct part-relative-element (collect sizer plain)
    #:extra-constructor-name make-part-relative-element)
  collect : (collect-info? . -> . content?)
  sizer : (-> any/c)
  plain : (-> any/c)
```

Similar to `delayed-block`, but the replacement content is obtained in the collect pass by calling the function in the `resolve` field.

The `resolve` function can call `collect-info-parents` to obtain a list of parts that enclose the element, starting with the nearest enclosing part. Functions like `part-collected-info` and `collected-info-number` can extract information like the part number.

```
(struct collect-element element (collect)
    #:extra-constructor-name make-collect-element)
  collect : (collect-info . -> . any)
```

Like `element`, but the `collect` procedure is called during the collect pass. The `collect` procedure normally calls `collect-put!`.

Unlike `delayed-element` or `part-relative-element`, the element remains intact (i.e., it is not replaced) by either the collect pass or resolve pass.

```
(struct render-element element (render)
    #:extra-constructor-name make-render-element)
  render : (any/c part? resolve-info? . -> . any)
```

Like `delayed-element`, but the `render` procedure is called during the render pass.

If a `render-element` instance is serialized (such as when saving collected info), it is reduced to a `element` instance.

```
(struct delayed-index-desc (resolve)
    #:extra-constructor-name make-delayed-index-desc)
  resolve : (any/c part? resolve-info? . -> . any/c)
```

Like `index-desc`, but the `resolve` procedure is called during the resolve pass. See also `index-element`.

```
(struct collected-info (number parent info)
    #:extra-constructor-name make-collected-info)
  number : (listof part-number-item?)
  parent : (or/c #f part?)
  info : any/c
```

Computed for each part by the collect pass.

The length of the `number` list indicates the section's nesting depth. Elements of `number` correspond to the section's number, it's parent's number, and so on (that is, the section numbers are in reverse order):

- A number value corresponds to a normally numbered section.
- A non-empty string corresponds to a `'grouper` section, which is shown as part of the combined section number only when it's the first element.
- A list corresponds to a numberer-generated section string plus its separator string, where the separator is used in a combined section number after the section string and before a subsection's number (or, for some output modes, before the title of the section).
- For an unnumbered section, a `#f` is used in place of any number or lists element, while `""` is used in place of all non-empty strings.

Changed in version 1.1 of package `scribble-lib`: Added `(list/c string? string?)` number items for numberer-generated section numbers.

```
(struct target-url (addr)
    #:extra-constructor-name make-target-url)
  addr : path-string?
```

Used as a style property for an `element`. A path is allowed for `addr`, but a string is interpreted as a URL rather than a file path.

```
(struct document-version (text)
    #:extra-constructor-name make-document-version)
  text : (or/c string? #f)
```

Used as a style property for a `part` to indicate a version number.

```
(struct document-date (text)
    #:extra-constructor-name make-document-date)
  text : (or/c string? #f)
```

Used as a style property for a `part` to indicate a date (which is typically used for Latex output).

```
(struct color-property (color)
    #:extra-constructor-name make-color-property)
  color : (or/c string? (list/c byte? byte? byte?))
```

Used as a style property for an `element` to set its color. Recognized string names for `color` depend on the renderer, but at the recognized set includes at least `"white"`, `"black"`, `"red"`, `"green"`, `"blue"`, `"cyan"`, `"magenta"`, and `"yellow"`. When `color` is a list of bytes, the values are used as RGB levels.

When rendering to HTML, a `color-property` is also recognized for a block, `part` (and used for the title in the latter case)or cell in a `table`.

```
(struct background-color-property (color)
    #:extra-constructor-name make-background-color-property)
  color : (or/c string? (list/c byte? byte? byte?))
```

Like `color-property`, but sets the background color.

```
(struct table-cells (styless)
    #:extra-constructor-name make-table-cells)
  styless : (listof (listof style?))
```

Used as a style property for a `table` to set its cells' styles.

If a cell style has a string name, it is used as an HTML class for the `<td>` tag, as a Latex command name, or as a Typst function name to wrap the content of a `table.cell`.

The following are recognized as cell-style properties:

- 'left — Left-align the cell content.
- 'right — Right-align the cell content top baselines.
- 'center — Center the cell content horizontally.
- 'top — Top-align the cell content.
- 'baseline — Align the cell content top baselines.
- 'bottom — bottom-align the cell content.
- 'vcenter — Center the cell content vertically.
- 'border — Draw a line around all sides of the cell. Borders along a shared edge of adjacent cells are collapsed into a single line.
- 'left-border, 'right-border, 'top-border, or 'bottom-border — Draw a line along the corresponding side of the cell (with the same border collapsing as for 'border).
- color-property structure — For HTML, applies a color to the cell content.
- background-color-property structure — For HTML, applies a color to the background of the cell.
- cell-padding-property structure — Specifies padding to add around a cell's content.
- attributes — Provides additional HTML attributes for the cell's <td> tag.

Changed in version 1.1 of package scribble-lib: Added color-property and background-color-property support.
Changed in version 1.4: Added 'border, 'left-border, 'right-border, 'top-border, and 'bottom-border support.

```
(struct table-columns (styles)
    #:extra-constructor-name make-table-columns)
  styles : (listof style?)
```

Like table-cells, but with support for a column-attributes property in each style, and the styles list is otherwise duplicated for each row in the table. The non-column-attributes parts of a table-columns are used only when a table-cells property is not present along with the table-columns property.

For HTML table rendering, for each column that has a column-attributes property in the corresponding element of styles, the attributes are put into an HTML col tag within the table.

```
(struct cell-padding-property (left top right bottom)
    #:extra-constructor-name make-cell-padding-property)
  left : real?
  top : real?
  right : real?
  bottom : real?
```

When used as a cell property for a `table`, specifies padding to add around the cell content. Padding is expressed in "ex" units, which corresponds roughly to the width of a character.

Added in version 1.58 of package `scribble-lib`.

```
(struct box-mode (top-name center-name bottom-name)
    #:extra-constructor-name make-box-mode)
  top-name : string?
  center-name : string?
  bottom-name : string?
(box-mode* name) → box-mode?
  name : string?
```

As a style property, indicates that a nested flow or paragraph is *boxable* when it is used in a *boxing context* for Latex output, but a nested flow is boxable only if its content is also boxable.

A boxing context starts with a table cell in a multi-column table, and the content of a block in a boxing context is also in a boxing context. If the cell's content is boxable, then the content determines the width of the cell, otherwise a width is imposed. A paragraph with a `#f` style name is boxable as a single line; the `'wraps` style name makes the paragraph non-boxable so that its width is imposed and its content can use multiple lines. A table is boxable when that all of its cell content is boxable.

To generate output in box mode, the `box-mode` property supplies Latex macro names to apply to the nested flow or paragraph content. The `top-name` macro is used if the box's top line is to be aligned with other boxes, `center-name` if the box's center is to be aligned, and `bottom-name` if the box's bottom line is to be aligned. The `box-mode*` function creates a `box-mode` structure with the same name for all three fields.

A `box-mode` style property overrides any automatic boxed rendering (e.g., for a paragraph with style name `#f`). If a block has both a `box-mode` style property and a `'multicommand` style property, then the Latex macro `top-name`, `center-name`, or `bottom-name` is applied with a separate argument for each of its content.

```
(block? v) → boolean?
  v : any/c
```

Returns `#t` if *v* is a `paragraph`, `table`, `itemization`, `nested-flow`, `traverse-block`,

or delayed-block, #f otherwise.

```
(content? v) → boolean?
  v : any/c
```

Returns #t if v is a string, symbol, element, multiarg-element, traverse-element, delayed-element, part-relative-element, a convertible value in the sense of convertible?, or list of content. Otherwise, it returns #f.

```
(struct style (name properties)
    #:extra-constructor-name make-style)
  name : (or/c string? symbol? #f)
  properties : list?
```

Represents a style.

```
plain : style?
```

A style (make-style #f null).

```
(element-style? v) → boolean?
  v : any/c
```

Returns #t if v is a string, symbol, #f, or style structure.

```
(tag? v) → boolean?
  v : any/c
```

Returns #t if v is acceptable as a link tag, which is a list containing a symbol and either a string, a generated-tag instance, or a non-empty list of serializable? values.

```
(struct generated-tag ()
    #:extra-constructor-name make-generated-tag)
```

A placeholder for a tag to be generated during the collect pass. Use tag-key to convert a tag containing a generated-tag instance to one containing a string.

```
(content->string content) → string?
  content : content?
(content->string content renderer p info) → string?
  content : content?
  renderer : any/c
  p : part?
  info : resolve-info?
```

Converts content to a single string (essentially rendering the content as “plain text”).

If *p* and *info* arguments are not supplied, then a pre-“collect” substitute is obtained for delayed elements. Otherwise, the two arguments are used to force the delayed element (if it has not been forced already).

```
(content-width c) → exact-nonnegative-integer?
  c : content?
```

Returns the width in characters of the given content.

```
(block-width e) → exact-nonnegative-integer?
  e : block?
```

Returns the width in characters of the given block.

```
(part-number-item? v) → boolean
  v : any/c
```

Return `#t` if *v* is `#f`, an exact non-negative integer, a string, or a list containing two strings. See `collected-info` for information on how different representations are used for numbering.

Added in version 1.1 of package `scribble-lib`.

```
(numberer? v) → boolean?
  v : any/c
(make-numberer step initial-value) → numberer?
  step : (any/c (listof part-number-item?)
          . -> .
          (values part-number-item? any/c))
  initial-value : any/c
(numberer-step n
               parent-number
               ci
               numberer-values) → part-number-item? hash?
  n : numberer?
  parent-number : (listof part-number-item?)
  ci : collect-info?
  numberer-values : hash?
```

A *numberer* implements a representation of a section number that increment separately from the default numbering style and that can be rendered differently than as Arabic numerals.

The `numberer?` function returns `#t` if *v* is a numberer, or `#f` otherwise.

The make-numberer function creates a numberer. The *step* function computes both the current number's representation and increments the number, where the "number" can be an arbitrary value; the *initial-value* argument determines the initial value of the "number", and the *step* function receives the current value as its first argument and returns an incremented value as its second result. A numberer's "number" value starts fresh at each new nesting level. In addition to the numberer's current value, the *step* function receives the parent section's numbering (so that its result can depend on the part's nesting depth).

The numberer-step function is normally used by a renderer. It applies a numberer, given the parent section's number, a collect-info value, and a hash table that accumulates numberer values at a given nesting layer. The collect-info argument is needed because a numberer's identity is based on a generated-tag. The result of numberer-step is the rendered form of the current section number plus an updated hash table with an incremented value for the numberer.

Typically, the rendered form of a section number (produced by numberer-step) is a list containing two strings. The first string is the part's immediate number, which can be combined with a prefix for enclosing parts' numbers. The second string is a separator that is placed after the part's number and before a subsection's number for each subsection. If numberer-step produces a plain string for the rendered number, then it is not added as a prefix to subsection numbers. See also collected-info.

Added in version 1.1 of package scribble-lib.

```
(struct link-render-style (mode)
    #:extra-constructor-name make-link-render-style)
  mode : (or/c 'default 'number 'short 'number-and-title)
```

Used as a style property for a part or a specific link-element to control the way that a hyperlink is rendered for a part via secref or for a figure via figure-ref from scribble/figure.

The 'default and 'number modes represent generic hyperlink-style configurations that could make sense for various kinds of references. The 'number style is intended to mean that a specific number is shown for the reference and that only the number is hyperlinked. The 'default style is more flexible, allowing a more appropriate choice for the rendering context, such as using the target section's name for a hyperlink in HTML.

The 'short mode shows just the number, as "§3.2"; the 'number-and-title mode shows the number and the title together, as "§3.2 "Some Section"". Both bypass the document style's own customization of 'default/'number rendering; see link-element for the exact rendering, including how each falls back when a section has no number.

Added in version 1.26 of package scribble-lib.
Changed in version 1.69: Added the 'short and 'number-and-title modes.

```
(current-link-render-style) → link-render-style?
```

```
(current-link-render-style style) → void?
  style : link-render-style?
```

A parameter that determines the default rendering style for a section link.

When a part has a link-render-style as one of its style properties, then the current-link-render-style parameter is set during the resolve pass and render pass for the part's content.

Added in version 1.26 of package scribble-lib.

```
(struct collect-info (fp
                      ht
                      ext-ht
                      ext-demand
                      parts
                      tags
                      gen-prefix
                      relatives
                      parents)
    #:extra-constructor-name make-collect-info)
  fp : any/c
  ht : any/c
  ext-ht : any/c
  ext-demand : (tag? collect-info? . -> . any/c)
  parts : any/c
  tags : any/c
  gen-prefix : any/c
  relatives : any/c
  parents : (listof part?)
```

Encapsulates information accumulated (or being accumulated) from the collect pass. The fields are exposed, but not currently intended for external use, except that collect-info-parents is intended for external use.

```
(struct resolve-info (ci delays undef searches)
    #:extra-constructor-name make-resolve-info)
  ci : any/c
  delays : any/c
  undef : any/c
  searches : any/c
```

Encapsulates information accumulated (or being accumulated) from the resolve pass. The fields are exposed, but not currently intended for external use.

```
(info-key? v) → boolean?
  v : any/c
```

Returns `#t` if *v* is an *info key*: a list of at least two elements whose first element is a symbol. The result is `#f` otherwise.

For a list that is an info tag, the interpretation of the second element of the list is effectively determined by the leading symbol, which classifies the key. However, a `#f` value as the second element has an extra meaning: collected information mapped by such info keys is not propagated out of the part where it is collected; that is, the information is available within the part and its sub-parts, but not in ancestor or sibling parts.

Note that every tag is an info key.

```
(collect-put! ci key val) → void?
  ci : collect-info?
  key : info-key?
  val : any/c
```

Registers information in *ci*. This procedure should be called only during the collect pass.

```
(resolve-get p ri key) → any/c
  p : (or/c part? #f)
  ri : resolve-info?
  key : info-key?
```

Extract information during the resolve pass or render pass for *p* from *ri*, where the information was previously registered during the collect pass. See also §6.3.4 “Collected and Resolved Information”.

The result is `#f` if the no value for the given key is found. Furthermore, the search failure is recorded for potential consistency reporting, such as when `racket setup` is used to build documentation.

```
(resolve-get/ext? p ri key) → any/c boolean?
  p : (or/c part? #f)
  ri : resolve-info?
  key : info-key?
```

Like `resolve-get`, but returns a second value to indicate whether the resulting information originated from an external source (i.e., a different document).

```
(resolve-get/ext-id p ri key) → any/c (or/c boolean? string?)
  p : (or/c part? #f)
  ri : resolve-info?
  key : info-key?
```

Like `resolve-get/ext?`, but the second result can be a string to indicate the source document’s identification as established via `load-xref` and a `#:doc-id` argument.

Added in version 1.1 of package `scribble-lib`.

```
(resolve-search dep-key p ri key) → void?
  dep-key : any/c
  p : (or/c part? #f)
  ri : resolve-info?
  key : info-key?
```

Like `resolve-get`, but a shared *dep-key* groups multiple searches as a single request for the purposes of consistency reporting and dependency tracking. That is, a single success for the same *dep-key* means that all of the failed attempts for the same *dep-key* have been satisfied. However, for dependency checking, such as when using `racket setup` to rebuild documentation, all attempts are recorded (in case external changes mean that an earlier attempt would succeed next time).

The *dep-key* can be any value, but when it is a pair with `#f` as its `car`, then a failed search (possibly after re-builds) is not reported for the key.

Changed in version 1.43 of package `scribble-lib`: Added the convention to suppress reporting for a *dep-key* starts with `#f`.

```
(resolve-get/tentative p ri key) → any/c
  p : (or/c part? #f)
  ri : resolve-info?
  key : info-key?
```

Like `resolve-search`, but without dependency tracking. For multi-document settings where dependencies are normally tracked, such as when using `racket setup` to build documentation, this function is suitable for use only for information within a single document.

```
(resolve-get-keys p ri pred) → list?
  p : (or/c part? #f)
  ri : resolve-info?
  pred : (info-key? . -> . any/c)
```

Applies *pred* to each key mapped for *p* in *ri*, returning a list of all keys for which *pred* returns a true value.

```
(part-collected-info p ri) → collected-info?
  p : part?
  ri : resolve-info?
```

Returns the information collected for *p* as recorded within *ri*.

```
(current-part-context-accumulation key) → any/c
  key : any/c
```

Retrieves the accumulated value for a key in the part context for enclosing parts, returning `#f` if no value has been accumulated for the key.

Added in version 1.54 of package `scribble-lib`.

```
(tag-key t ri) → tag?
  t : tag?
  ri : resolve-info?
```

Converts a `generated-tag` value with `t` to a string.

```
(traverse-block-block b i) → block?
  b : traverse-block?
  i : (or/c resolve-info? collect-info?)
```

Produces the block that replaces `b`.

```
(traverse-element-content e i) → content?
  e : traverse-element?
  i : (or/c resolve-info? collect-info?)
```

Produces the content that replaces `e`.

```
part-traverse-procedure/c : contract?
```

Defined as

```
(recursive-contract
 ((symbol? any/c . -> . any/c)
  (symbol? any/c . -> . any)
  . -> . (or/c part-traverse-procedure/c
               (listof part?))))
```

```
block-traverse-procedure/c : contract?
```

Defined as

```
(recursive-contract
 ((symbol? any/c . -> . any/c)
  (symbol? any/c . -> . any)
  . -> . (or/c block-traverse-procedure/c
               block?)))
```

```
element-traverse-procedure/c : contract?
```

Defined as

```
(recursive-contract
 ((symbol? any/c . -> . any/c)
  (symbol? any/c . -> . any)
  . -> . (or/c element-traverse-procedure/c
               content?)))
```

6.3.6 HTML Style Properties

```
(require scribble/html-properties)
```
package: scribble-lib

The scribble/html-properties library provides datatypes used as style properties for HTML rendering.

```
(struct attributes (assoc)
    #:extra-constructor-name make-attributes)
  assoc : (listof (cons/c symbol? string?))
```

Used as a style property to add arbitrary attributes to an HTML tag.

```
(struct alt-tag (name)
    #:extra-constructor-name make-alt-tag)
  name : (and/c string? #rx"^[a-zA-Z0-9]+$")
```

Used as a style property for an element, paragraph, or compound-paragraph to substitute an alternate HTML tag (instead of , <p>, , etc.).

```
(struct column-attributes (assoc)
    #:extra-constructor-name make-column-attributes)
  assoc : (listof (cons/c symbol? string?))
```

Used as a style property on a style with table-columns to add arbitrary attributes to an HTML col tag within the table.

```
(struct link-query-addition (params)
    #:extra-constructor-name make-link-query-addition)
  params : (listof (cons/c symbol? string?))
```

Used as a style property for an link-element to add query parameters to the link. The params field provides a list of symbol keys and string values, which are added in order to the hyperlink.

Added in version 1.65 of package scribble-lib.

```
(struct url-anchor (name)
    #:extra-constructor-name make-url-anchor)
  name : string?
```

Used as a style property with `element` to insert an anchor before the element.

```
(struct hover-property (text)
    #:extra-constructor-name make-hover-property)
  text : string?
```

Used as a style property with `element` to add text that is shown when the mouse hovers over the element.

```
(struct script-property (type script)
    #:extra-constructor-name make-script-property)
  type : string?
  script : (or/c path-string? (listof string?))
```

Used as a style property with `element` to supply a script alternative to the element content.

```
(struct xexpr-property (before after)
    #:extra-constructor-name make-xexpr-property)
  before : xexpr/c
  after : xexpr/c
```

Used as a style property with `element` to supply literal HTML that is rendered before and after element content.

Example:

```
#lang scribble/base
@(require scribble/core
          scribble/html-properties
          (only-in xml cdata))

@(define comments (xexpr-property
                   (cdata #f #f "<!-- before -->")
                   (cdata #f #f "<!-- after -->")))

Here is some
@elem[#:style (style #f (list comments))]{content with comments around}.
```

Added in version 1.27 of package `scribble-lib`.

```
(struct css-addition (path)
    #:extra-constructor-name make-css-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               url?
               bytes?)
```

Used as a style property to supply a CSS file (if `path` is a path, string, or list), URL (if `path` is a `url`) or content (if `path` is a byte string) to be referenced or included in the generated HTML. This property can be attached to any style, and all additions are collected and lifted to the enclosing generated HTML. When the style property is attached to a part, then it is also propagated to any generated HTML for a subpart of the part.

The `path` field can be a result of `path->main-collects-relative`.

```
(struct css-style-addition (path)
    #:extra-constructor-name make-css-style-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               url?
               bytes?)
```

Like `css-addition`, but added after any style files that are specified by a document and before any style files that are provided externally.

```
(struct js-addition (path)
    #:extra-constructor-name make-js-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               url?
               bytes?)
```

Like `css-addition`, but for a JavaScript file instead of a CSS file.

```
(struct js-style-addition (path)
    #:extra-constructor-name make-js-style-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               url?
               bytes?)
```

Like `css-style-addition`, but for a JavaScript file instead of a CSS file.

```
(struct body-id (value)
    #:extra-constructor-name make-body-id)
  value : string?
```

Used as a style property to associate an `id` attribute with an HTML tag within a main `part`.

```
(struct document-source (module-path)
    #:extra-constructor-name make-document-source)
  module-path : module-path?
```

Used as a style property to associate a module path with a part. Clicking on a section title within the part may show `module-path` with the part's tag string, so that authors of other documents can link to the section.

More specifically, the section title is given the HTML attributes `x-source-module` and `x-part-tag`, plus `x-part-prefixes` if the section or enclosing sections declare tag prefixes, and `x-source-pkg` if the source is found within a package at document-build time. The `scribble/manual` style recognizes those tags to make clicking a title show cross-reference information.

Added in version 1.2 of package `scribble-lib`.
Changed in version 1.7: Added `x-part-prefixes`.
Changed in version 1.9: Added `x-source-pkg`.

```
(struct html-defaults (prefix style extra-files)
    #:extra-constructor-name make-html-defaults)
  prefix : (or/c bytes? path-string?
                 (cons/c 'collects (listof bytes?)))
  style : (or/c bytes? path-string?
                (cons/c 'collects (listof bytes?)))
  extra-files : (listof (or/c path-string?
                              (cons/c 'collects (listof bytes?))))
```

Like `latex-defaults`, but use for the `scribble` command-line tool's `--html` and `--htmls` modes.

```
(struct head-extra (xexpr)
    #:extra-constructor-name make-head-extra)
  xexpr : xexpr/c
```

For a `part` that corresponds to an HTML page, adds content to the `<head>` tag.

```
(struct head-addition (xexpr)
    #:extra-constructor-name make-head-addition)
  xexpr : xexpr/c
```

Like `head-extra` in content, but propagated to enclosing and nested HTML pages like `css-addition`. Additions to `<head>` via `head-addition` appear before additions via `head-extra`.

Added in version 1.38 of package `scribble-lib`.

```
(struct initial-scale (value)
    #:extra-constructor-name make-initial-scale)
  value : (real-in 0.0 10.0)
```

Adjusts `initial-scale` in a `meta` tag with name `viewport`. The default is `1.0`.

Added in version 1.61 of package `scribble-lib`.

```
(struct render-convertible-as (types)
    #:extra-constructor-name make-render-convertible-as)
  types : (listof (or/c 'png-bytes 'svg-bytes 'gif-bytes))
```

For a `part` that corresponds to an HTML page, controls how objects that subscribe to the `file/convertible` protocol are rendered.

The alternatives in the `types` field are tried in order and the first one that succeeds is used in the html output.

Changed in version 1.34 of package `scribble-lib`: Added support for `'gif-bytes`.

```
(struct part-link-redirect (url)
    #:extra-constructor-name make-part-link-redirect)
  url : url?
```

As a style property on a part, causes hyperiinks to the part to be redirected to `url` instead of the rendered part.

```
(struct part-title-and-content-wrapper (tag attribs)
    #:extra-constructor-name make-part-title-and-content-wrapper)
  tag : string?
  attribs : (listof (list/c symbol? string?))
```

Used as a style property on a `part` to add a tag with attributes around a part title and its content that is rendered on the same HTML page.

Added in version 1.49 of package `scribble-lib`.

```
(struct link-resource (path)
    #:extra-constructor-name make-link-resource)
  path : path-string?
```

As a style property on an `element`, causes the elements to be rendered as a hyperlink to (a copy of) `path`.

The file indicated by `path` is referenced in place when `render<%>` is instantiated with `refer-to-existing-files` as true. Otherwise, it is copied to the destination directory and potentially renamed to avoid conflicts.

```
(struct install-resource (path)
    #:extra-constructor-name make-install-resource)
  path : path-string?
```

Like link-resource, but makes path accessible in the destination without rendering a hyperlink.

This style property is useful only when render<%> is instantiated with refer-to-existing-files as #f, and only when path does not match then name of any other file that is copied by the renderer to the destination.

6.3.7 Latex Style Properties

```
(require scribble/latex-properties)
```
package: scribble-lib

The scribble/latex-properties library provides datatypes used as style properties for Latex rendering.

```
(struct tex-addition (path)
    #:extra-constructor-name make-tex-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               bytes?)
```

Used as a style property to supply a ".tex" file (if path is a path, string, or list) or content (if path is a byte string) to be included in the generated Latex. This property can be attached to any style, and all additions are collected to the top of the generated Latex file.

The path field can be a result of path->main-collects-relative.

```
(struct latex-defaults (prefix style extra-files)
    #:extra-constructor-name make-latex-defaults)
  prefix : (or/c bytes? path-string?
                 (cons/c 'collects (listof bytes?)))
  style : (or/c bytes? path-string?
                (cons/c 'collects (listof bytes?)))
  extra-files : (listof (or/c path-string?
                              (cons/c 'collects (listof bytes?))))
```

Used as a style property on the main part of a document to set a default prefix file, style file, and extra files (see §6.11.2 “Configuring Output”). The defaults are used by the scribble command-line tool for --latex or --pdf mode if none are supplied via --prefix and --style (where extra-files are used only when prefix is used). A byte-string value

is used directly like file content, and a path can be a result of path->main-collects-relative.

Languages (used with #lang) like scribble/manual and scribble/sigplan add this property to a document to specify appropriate files for Latex rendering. With scribble/base, not specifying a latex-defaults struct is equivalent to using this one:

```
(latex-defaults
 (list 'collects #"scribble" #"scribble-prefix.tex")
 (list 'collects #"scribble" #"scribble-style.tex")
 '())
```

See also scribble/latex-prefix.

```
(struct latex-defaults+replacements latex-defaults (replacements)
    #:extra-constructor-name make-latex-defaults+replacements)
  replacements : (hash/c string? (or/c bytes? path-string?
                                       (cons/c 'collects (listof bytes?))))
```

Like latex-defaults but it allows for more configuration.

For example if the replacements maps "scribble-load-replace.tex" to "my-scribble.tex", then the "my-scribble.tex" file in the current directory will be used in place of the standard scribble package inclusion header. Using "scribble-load-replace.tex" can disable the use of possibly-conflicting packages in the LaTeX output. The file (collection-file-path "scribble" "scribble.tex") contains a number of macros of the form \packageMathabx that will, by default, load the corresponding packages. Use a "scribble-load-replace.tex" replacement with content like #"\\renewcommand{\\packageMathabx}{\\relax}\n" to disable the loading of those packages.

```
(struct command-extras (arguments)
    #:extra-constructor-name make-command-extras)
  arguments : (listof string?)
```

Used as a style property on an element to add extra arguments to the element's command in Latex output or the element's. function for Typst output.

```
(struct command-optional (arguments)
    #:extra-constructor-name make-command-optional)
  arguments : (listof string?)
```

Used as a style property on a element to add optional arguments to the element's command in Latex output.

Added in version 1.20 of package scribble-lib.

```
(struct short-title (text)
    #:extra-constructor-name make-short-title)
  text : (or/c string? #f)
```

Used as a style property on a `title-decl`. Attaches a short title to the title for a `part` if the Latex class file uses a short title.

Added in version 1.20 of package `scribble-lib`.

```
(struct table-row-skip (amount)
    #:extra-constructor-name make-table-row-skip)
  amount : string?
```

Used as a style property in `table-cells` to specify a spacing adjustment between the cell's row and the row afterward, such as `"1ex"` to increase the space or `"-1ex"` to decrease it. If multiple cells on a row provide this property, the first one in the row is used.

Added in version 1.33 of package `scribble-lib`.

6.3.8 Typst Style Properties

```
(require scribble/typst-properties)
```
package: `scribble-lib`

The `scribble/latex-properties` library provides datatypes used as style properties for Typst rendering.

Added in version 1.66 of package `scribble-lib`.

```
(struct typ-addition (path)
    #:extra-constructor-name make-typ-addition)
  path : (or/c path-string?
               (cons/c 'collects (listof bytes?))
               bytes?)
```

Like `tex-addition`, but for Typst output.

```
(struct typst-defaults (prefix style extra-files)
    #:extra-constructor-name make-typst-defaults)
  prefix : (or/c bytes? path-string?
                 (cons/c 'collects (listof bytes?)))
  style : (or/c bytes? path-string?
                (cons/c 'collects (listof bytes?)))
  extra-files : (listof (or/c path-string?
                              (cons/c 'collects (listof bytes?))))
```

Like `latex-defaults`, but for Typst output.

6.4 Renderers

A renderer is an object that provides four main methods: `traverse`, `collect`, `resolve`, and `render`. Each method corresponds to a pass described in §6.3 “Structures And Processing”, and they are chained together by the `render` function to render a document.

6.4.1 Rendering Driver

`(require scribble/render)` package: `scribble-lib`

```
(render
 docs
 names
 [#:render-mixin render-mixin
  #:dest-dir dest-dir
  #:helper-file-prefix helper-file-prefix
  #:keep-existing-helper-files? keep-existing-helper-files?
  #:prefix-file prefix-file
  #:style-file style-file
  #:style-extra-files style-extra-files
  #:extra-files extra-files
  #:image-preferences image-preferences
  #:xrefs xrefs
  #:info-in-files info-in-files
  #:info-out-file info-out-file
  #:redirect redirect
  #:redirect-main redirect-main
  #:directory-depth directory-depth
  #:quiet? quiet?
  #:warn-undefined? warn-undefined?])
→ void?
 docs : (listof part?)
 names : (listof path-string?)
 render-mixin : (class? . -> . class?) = render-mixin
 dest-dir : (or/c #f path-string?) = #f
 helper-file-prefix : (or/c #f string?) = #f
 keep-existing-helper-files? : any/c = #f
 prefix-file : (or/c #f path-string?) = #f
 style-file : (or/c #f path-string?) = #f
 style-extra-files : (listof path-string?) = #f
 extra-files : (listof path-string?) = #f
```

```
image-preferences : (listof (or/c 'ps 'pdf 'png 'svg 'gif))
                  = null
xrefs : (listof xref?) = null
info-in-files : (listof path-string?) = null
info-out-file : (or/c #f path-string?) = #f
redirect : (or/c #f string?) = #f
redirect-main : (or/c #f string?) = #f
directory-depth : exact-nonnegative-integer? = 0
quiet? : any/c = #t
warn-undefined? : any/c = (not quiet?)
```

Renders the given *docs*, each with an output name derived from the corresponding element of *names*. A directory path (if any) for a name in *names* is discarded, and the file suffix is replaced (if any) with a suitable suffix for the output format.

The *render-mixin* argument determines the output format. By default, it is render-mixin from scribble/html-render.

The *dest-dir* argument determines the output directory, which is created using make-directory* if it is non-#f and does not exist already.

The *helper-file-prefix*, *keep-existing-helper-files?*, *prefix-file*, *style-file*, *style-extra-files*, and *extra-files* arguments are passed on to the render% constructor.

The *image-preferences* argument specified preferred formats for image files and conversion, where formats listed earlier in the list are more preferred. The renderer specified by *render-mixin* may not support all of the formats listed in *image-preferences*.

The *xrefs* argument provides extra cross-reference information to be used during the documents' resolve pass. The *info-in-files* arguments supply additional cross-reference information in serialized form. When the *info-out-file* argument is not #f, cross-reference information for the rendered documents is written in serialized for to the specified file.

The *redirect* and *redirect-main* arguments correspond to the set-external-tag-path and set-external-root-url methods of render-mixin from scribble/html-render, so they should be non-#f only for HTML rendering.

The *directory-depth* arguments correspond to the set-directory-depth method of render-multi-mixin.

If *quiet?* is a false value, output-file information is written to the current output port.

If *warn-undefined?* is a true value, then references to missing cross-reference targets trigger a warning message on the current error port.

Changed in version 1.4 of package scribble-lib: Added the #:image-preferences argument.

Changed in version 1.40: Added the `--keep-existing-helper-files?` initialization argument and fixed `--helper-file-prefix` to work correctly for HTML output.

6.4.2 Base Renderer

```
(require scribble/base-render)
```
package: `scribble-lib`

The `scribble/base-render` module provides `render%`, which implements the core of a renderer. This rendering class must be refined with a mixin from `scribble/text-render`, `scribble/markdown-render`, `scribble/typst-render`, `scribble/html-render`, or `scribble/latex-render`.

The mixin structure is meant to support document-specific extensions to the renderers. For example, the `scribble` command-line tool might, in the future, extract rendering mixins from a document module (in addition to the document proper).

See the `"base-render.rkt"` source for more information about the methods of the renderer. Documents built with higher layers, such as `scribble/manual`, generally do not call the render object's methods directly.

```
render<%> : interface?
```

```
(send a-render traverse srcs dests) → (and/c hash? immutable?)
  srcs : (listof part?)
  dests : (listof path-string?)
```

Performs the traverse pass, producing a hash table that contains the replacements for and `traverse-block`s and `traverse-element`s. See `render` for information on the *dests* argument.

```
(send a-render collect srcs dests fp [demand]) → collect-
info?
  srcs : (listof part?)
  dests : (listof path-string?)
  fp : (and/c hash? immutable?)
  demand : (tag? collect-info? . -> . any/c)
         = (lambda (tag ci) #f)
```

Performs the collect pass. See `render` for information on the *dests* arguments. The *fp* argument is a result from the `traverse` method.

The *demand* argument supplies external tag mappings on demand. When the `collect-info` result is later used to find a mapping for a tag and no mapping is already available, *demand* is called with the tag and the `collect-info`.

The *demand* function returns true to indicate when it adds information to the collect-info so that the lookup should be tried again; the *demand* function should return #f if it does not extend collect-info.

```
(send a-render resolve srcs dests ci) → resolve-info?
  srcs : (listof part?)
  dests : (listof path-string?)
  ci : collect-info?
```

Performs the resolve pass. See render for information on the *dests* argument. The *ci* argument is a result from the collect method.

```
(send a-render render srcs dests ri) → list?
  srcs : (listof part?)
  dests : (listof (or/c path-string? #f))
  ri : resolve-info?
```

Produces the final output. The *ri* argument is a result from the resolve method.

The *dests* provide names of files for Latex or single-file HTML output, or names of sub-directories for multi-file HTML output. If the *dests* are relative, they're relative to the current directory; normally, they should indicates a path within the *dest-dir* supplied on initialization of the render% object.

If an element of *dests* is #f, then the corresponding position of the result list contains a string for rendered document. Some renderers require that dest contains all path strings.

```
(send a-render serialize-info ri) → any/c
  ri : resolve-info?
```

Serializes the collected info in *ri*.

```
(send a-render serialize-infos ri count doc) → list?
  ri : resolve-info?
  count : exact-positive-integer?
  doc : part?
```

Like serialize-info, but produces *count* results that together have the same information as produced by serialize-info. The structure of *doc* is used to drive the partitioning (on the assumption that *ri* is derived from *doc*).

```
(send a-render deserialize-info  v
                                 ci
                                [#:root root-path
                                 #:pkg pkg])       → void?
```

```
  v : any/c
  ci : collect-info?
  root-path : (or/c path-string? false/c) = #f
  pkg : (or/c path? false/c) = #f
```

Adds the deserialized form of *v* to *ci*.

If *root-path* is not #f, then file paths that are recorded in *ci* as relative to an instantiation-supplied *root-path* are deserialized as relative instead to the given *root-path*.

If *pkg* is not #f, then deserialized information is recorded as being from a document in the named package.

Changed in version 1.52 of package `scribble-lib`: Added the *pkg* argument.

```
(send a-render get-defined ci) → (listof tag?)
  ci : collect-info?
```

Returns a list of tags that were defined within the documents represented by *ci*.

```
(send a-render get-defineds ci count doc)
 → (listof (listof tag?))
  ci : collect-info?
  count : exact-positive-integer?
  doc : part?
```

Analogous to serialize-infos: returns a list of tags for each of *count* partitions of the result of get-defined, using the structure of *doc* to drive the partitioning.

```
(send a-render get-external ri) → (listof tag?)
  ri : resolve-info?
```

Returns a list of tags that were referenced but not defined within the documents represented by *ri* (though possibly found in cross-reference information transferred to *ri* via xref-transfer-info).

```
(send a-render get-undefined ri) → (listof tag?)
  ri : resolve-info?
```

Returns a list of tags that were referenced by the resolved documents with no target found either in the resolved documents represented by *ri* or cross-reference information transferred to *ri* via xref-transfer-info.

If multiple tags were referenced via resolve-search and a target was found for any of the tags using the same dependency key, then no tag in the set is included in the list of undefined tags.

```
render% : class?
  superclass: object%
  extends: render<%>
```

Represents a renderer.

```
(new render%
     [dest-dir dest-dir]
    [[refer-to-existing-files refer-to-existing-files]
     [root-path root-path]
     [prefix-file prefix-file]
     [style-file style-file]
     [style-extra-files style-extra-files]
     [extra-files extra-files]
     [helper-file-prefix helper-file-prefix]
     [keep-existing-helper-files? keep-existing-helper-files?]
     [image-preferences image-preferences]])
→ (is-a?/c render%)
 dest-dir : path-string?
 refer-to-existing-files : any/c = #f
 root-path : (or/c path-string? #f) = #f
 prefix-file : (or/c path-string? #f) = #f
 style-file : (or/c path-string? #f) = #f
 style-extra-files : (listof path-string?) = null
 extra-files : (listof path-string?) = null
 helper-file-prefix : (or/c path-string? #f) = #f
 keep-existing-helper-files? : any/c = #f
 image-preferences : (listof (or/c 'ps 'pdf 'png 'svg 'gif))
                   = null
```

Creates a renderer whose output will go to *dest-dir*. For example, *dest-dir* could name the directory containing the output Latex file, the HTML file for a single-file output, or the output sub-directory for multi-file HTML output.

If *refer-to-existing-files* is true, then when a document refers to external files, such as an image or a style file, then the file is referenced from its source location instead of copied to the document destination.

If *root-path* is not `#f`, it is normally the same as *dest-dir* or a parent of *dest-dir*. It causes cross-reference information to record destination files relative to *root-path*; when cross-reference information is serialized, it can be deserialized via `deserialize-info` with a different root path (indicating that the destination files have moved).

The *prefix-file*, *style-file*, and *style-extra-files* arguments set

files that control output styles in a formal-specific way; see §6.11.2 “Configuring Output” for more information.

The *extra-files* argument names files to be copied to the output location, such as image files or extra configuration files.

The *helper-file-prefix* argument supplies a prefix that is used for any copied or generated files used by the main destination file. This prefix is not used for files listed in *extra-files*. If *keep-existing-helper-files?* is true, then any existing file that would otherwise be overwritten with a helper file is instead preserved, and the helper file is written to a different name, unless its content would be exactly the same as the existing file.

The *image-preferences* argument specified preferred formats for image files and conversion, where formats listed earlier in the list are more preferred. The renderer may not support all of the formats listed in *image-preferences*.

Changed in version 1.4 of package `scribble-lib`: Added the *image-preferences* initialization argument.

Changed in version 1.40: Added the `--keep-existing-helper-files?` initialization argument and fixed `--helper-file-prefix` to work correctly for HTML output.

```
(send a-render traverse parts dests) → (and/c hash? immutable?)
  parts : (listof part?)
  dests : (listof path-string?)
```

```
(send a-render start-traverse parts
                              dests
                              fp)   → (and/c hash? immutable?)
  parts : (listof part?)
  dests : (listof path-string?)
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-part p fp) → (and/c hash? immutable?)
  p : part?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-flow bs fp) → (and/c hash? immutable?)
  bs : (listof block?)
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-block b fp) → (and/c hash? immutable?)
  b : block?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-nested-flow nf fp)
 → (and/c hash? immutable?)
  nf : nested-flow?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-table t fp) → (and/c hash? immutable?)
  t : table?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-itemization i fp)
 → (and/c hash? immutable?)
  i : itemization?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-compound-paragraph cp
                                           fp)
 → (and/c hash? immutable?)
  cp : compound-paragraph?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-paragraph p fp)
 → (and/c hash? immutable?)
  p : paragraph?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-content c fp) → (and/c hash? immutable?)
  c : content?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-target-element e
                                       fp)
 → (and/c hash? immutable?)
  e : target-element?
  fp : (and/c hash? immutable?)
```

```
(send a-render traverse-index-element e fp)
 → (and/c hash? immutable?)
  e : index-element?
  fp : (and/c hash? immutable?)
```

These methods implement the traverse pass of document rendering. Except for the entry point `traverse` as described by as described at `traverse` in `render<%>`, these methods generally would not be called to render a document, but instead provide natural points to interpose on the default implementation.

A renderer for a specific format is relatively unlikely to override any of these methods. Each method accepts the information accumulated so far and returns augmented information as a result.

```
(send a-render traversed-parts parts fp) → (listof part?)
  parts : (listof part?)
  fp : (and/c hash? immutable?)
```

```
(send a-render traversed-parts-part part
                                    fp)  → part?
  part : part?
  fp : (and/c hash? immutable?)
```

The `traversed-parts` method replaces `traverse-part`s in the sub-parts of `parts` (transitively) with replacement *part*s. The result list has the same item as `parts` unmodified for each part that has no `traverse-part`s.

Added in version 1.67 of package `scribble-lib`.

```
(send a-render collect parts dests fp [demand]) → collect-
info?
  parts : (listof part?)
  dests : (listof path-string?)
  fp : (and/c hash? immutable?)
  demand : (tag? collect-info? . -> . any/c)
         = (lambda (tag ci) #f)
```

```
(send a-render start-collect parts dests ci) → void?
  parts : (listof part?)
  dests : (listof path-string?)
  ci : collect-info?
```

```
(send a-render collect-part p
                            parent
                            ci
                            number
                            init-sub-number
                            init-sub-numberers)
 → part-number-item? numberer?
  p : part?
  parent : (or/c #f part?)
  ci : collect-info?
  number : (listof part-number-item?)
  init-sub-number : part-number-item?
  init-sub-numberers : (listof numberer?)
```

```
(send a-render collect-part-tags p
                                 ci
                                 number) → void?
  p : part?
  ci : collect-info?
  number : (listof part-number-item?)
```

```
(send a-render collect-flow bs ci) → void?
  bs : (listof block?)
  ci : collect-info?
```

```
(send a-render collect-block b ci) → void?
  b : block?
  ci : collect-info?
```

```
(send a-render collect-nested-flow nf ci) → void?
  nf : nested-flow?
  ci : collect-info?
```

```
(send a-render collect-table t ci) → void?
  t : table?
  ci : collect-info?
```

```
(send a-render collect-itemization i ci) → void?
  i : itemization?
  ci : collect-info?
```

```
(send a-render collect-compound-paragraph cp
                                          ci) → void?
  cp : compound-paragraph?
  ci : collect-info?
```

```
(send a-render collect-paragraph p ci) → void?
  p : paragraph?
  ci : collect-info?
```

```
(send a-render collect-content c ci) → void?
  c : content?
  ci : collect-info?
```

```
(send a-render collect-target-element e ci) → void?
  e : target-element?
  ci : collect-info?
```

```
(send a-render collect-index-element e ci) → void?
  e : index-element?
  ci : collect-info?
```

These methods implement the collect pass of document rendering. Except for the entry point `collect` as described at `collect` in `render<%>`, these methods generally would not be called to render a document, but instead provide natural points to interpose on the default implementation.

A renderer for a specific format is most likely to override `collect-part-tags`, `collect-target-element`, and perhaps `start-collect` to set up and record cross-reference information in a way that is suitable for the target format.

```
(send a-render resolve parts dests ci) → resolve-info?
  parts : (listof part?)
  dests : (listof path-string?)
  ci : collect-info?
```

```
(send a-render start-resolve parts dests ri) → void?
  parts : (listof part?)
  dests : (listof path-string?)
  ri : resolve-info?
```

```
(send a-render resolve-part p ri) → void?
  p : part?
  ri : resolve-info?
```

```
(send a-render resolve-flow bs
                            enclosing-p
                            ri)         → void?
  bs : (listof block?)
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-block b
                             enclosing-p
                             ri)         → void?
  b : block?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-nested-flow nf
                                   enclosing-p
                                   ri)         → void?
  nf : nested-flow?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-table t
                             enclosing-p
                             ri)         → void?
  t : table?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-itemization i
                                   enclosing-p
                                   ri)          → void?
  i : itemization?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-compound-paragraph cp
                                          enclosing-p
                                          ri)          → void?
  cp : compound-paragraph?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-paragraph p
                                 enclosing-p
                                 ri)          → void?
  p : paragraph?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render resolve-content c
                               enclosing-p
                               ri)          → void?
  c : content?
  enclosing-p : part?
  ri : resolve-info?
```

These methods implement the resolve pass of document rendering. Except for the entry point `resolve` as described at `resolve` in `render<%>`, these methods generally would not be called to render a document, but instead provide natural points to interpose on the default implementation.

A renderer for a specific format is unlikely to override any of these methods. Each method for a document fragment within a part receives the enclosing part as an argument, as well as resolve information as *ri* to update.

```
(send a-render render parts dests ri) → list?
  parts : (listof part?)
  dests : (listof (or/c path-string? #f))
  ri : resolve-info?
```

```
(send a-render render-one part ri dest) → any/c
  part : part?
  ri : resolve-info?
  dest : (or/c path-string? #f)
```

```
(send a-render render-part p ri) → any/c
  p : part?
  ri : resolve-info?
```

```
(send a-render render-part-content p ri) → any/c
  p : part?
  ri : resolve-info?
```

```
(send a-render render-flow bs
                           enclosing-p
                           ri
                           first-in-part-or-item?) → any/c
  bs : (listof block?)
  enclosing-p : part?
  ri : resolve-info?
  first-in-part-or-item? : boolean?
```

```
(send a-render render-block b
                           enclosing-p
                           ri
                           first-in-part-or-item?) → any/c
  b : block?
  enclosing-p : part?
  ri : resolve-info?
  first-in-part-or-item? : boolean?
```

```
(send a-render render-nested-flow nf
                                  enclosing-p
                                  ri
                                  first-in-part-or-item?)
 → any/c
  nf : nested-flow?
  enclosing-p : part?
  ri : resolve-info?
  first-in-part-or-item? : boolean?
```

```
(send a-render render-table t
                            enclosing-p
                            ri
                            first-in-part-or-item?) → any/c
  t : table?
  enclosing-p : part?
  ri : resolve-info?
  first-in-part-or-item? : boolean?
```

```
(send a-render render-auxiliary-table t
                                      enclosing-p
                                      ri)          → any/c
  t : table?
  enclosing-p : part?
  ri : resolve-info?
```

```
(send a-render render-itemization i
                                  enclosing-p
                                  ri)          → any/c
  i : itemization?
  enclosing-p : part?
  ri : resolve-info?
```

```
 (send a-render render-compound-paragraph
  cp
  enclosing-p
  ri
  first-in-part-or-item?)
 → any/c
  cp : compound-paragraph?
  enclosing-p : part?
  ri : resolve-info?
  first-in-part-or-item? : boolean?
```

```
 (send a-render render-intrapara-block
  p
  enclosing-p
  ri
  first-in-compound-paragraph?
  last-in-compound-paragraph?
  first-in-part-or-item?)
```

```
→ any/c
 p : paragraph?
 enclosing-p : part?
 ri : resolve-info?
 first-in-compound-paragraph? : boolean?
 last-in-compound-paragraph? : boolean?
 first-in-part-or-item? : boolean?
```

```
(send a-render render-paragraph p
                                enclosing-p
                                ri)          → any/c
 p : paragraph?
 enclosing-p : part?
 ri : resolve-info?
```

```
(send a-render render-content c
                              enclosing-p
                              ri)          → any/c
 c : content?
 enclosing-p : part?
 ri : resolve-info?
```

```
(send a-render render-other c
                            enclosing-p
                            ri)          → any/c
 c : (and/c content? (not/c element?) (not/c convertible?))
 enclosing-p : part?
 ri : resolve-info?
```

These methods implement the render pass of document rendering. Except for the entry point `render` as described at `render` in `render<%>`, these methods generally would not be called to render a document, but instead provide natural points to interpose on the default implementation.

A renderer for a specific format is likely to override most or all of these methods. The result of each method can be anything, and the default implementations of the methods propagate results and collect them into a list as needed. The value of `current-output-port` is set by `render` for each immediate `part` before calling `render-one`, so methods might individually print to render, or they might return values that are used both other methods to print. The interposition points for this pass are somewhat different than for other passes:

- `render-one` is called by the `render` method on each immediate `part` in the list for its first argument.

- `render-auxiliary-table` is called by the default `render-block` on any `table` that has the `'aux` style property.
- `render-intrapara-block` is called on blocks within a `compound-paragraph`, where the default implementation just chains to `render% render-block`.
- `render-other` is called by the default implementation of `render-content` for any content that does not satisfy `element?` or `convertible?`.

6.4.3 Text Renderer

`(require scribble/text-render)` package: `scribble-lib`

`render-mixin : (class? . -> . class?)`
argument extends/implements: `render<%>`

Specializes a `render<%>` class for generating plain text.

6.4.4 Markdown Renderer

`(require scribble/markdown-render)` package: `scribble-lib`

`render-mixin : (class? . -> . class?)`
argument extends/implements: `render<%>`

Specializes a `render<%>` class for generating Markdown text.

Code blocks are marked using the Github convention

```racket
```racket
```

so that they are lexed and formatted as Racket code.

```
(current-markdown-link-sections) → boolean?
(current-markdown-link-sections enabled?) → void?
  enabled? : any/c
```
```

Determines whether section links within an output document are rendered as a section link. The default is `#f`.

Added in version 1.31 of package `scribble-lib`.

6.4.5 HTML Renderer

```
(require scribble/html-render)
```
package: `scribble-lib`

```
render-mixin : (class? . -> . class?)
```
argument extends/implements: `render<%>`

```
(new render-mixin
     [[search-box? search-box?]]
      ...superclass-args...)
→ (is-a?/c render-mixin)
 search-box? : boolean? = #f
```

Specializes a `render<%>` class for generating HTML output. The arguments are the same as `render<%>`, except for the addition of `search-box`.

If *search-box?* is `#t` and the document is created with `scribble/manual`, then it will be rendered with a search box, similar to this page. Note that the *search-box?* argument does not create the search page itself. Rather, it passes the search query to whatever page is located at `search/index.html`. The query is passed as an HTTP query string in the `q` field.

```
(send a-render set-external-tag-path url) → void?
  url : string?
```

Configures the renderer to redirect links to external documents via *url*, adding a `tag` query element to the end of the URL that contains the Base64-encoded, `print`ed, serialized original tag (in the sense of `link-element`) for the link. The result of `get-doc-search-url` is intended for use as *url*.

If the link is based on a cross-reference entry that has a document-identifying string (see `load-xref` and its `#:doc-id` argument), the document identifier is added as a `doc` query element, and a path to the target within the document is added as a `rel` query element.

```
(send a-render set-external-root-url url) → void?
  url : string?
```

Configures the renderer to redirect links to documents installed in the distribution's documentation directory to the given URL, using the URL as a replacement to the path of the distribution's document directory.

```
render-multi-mixin : (class? . -> . class?)
  argument extends/implements: render<%>
```

Further specializes a rendering class produced by `render-mixin` for generating multiple HTML files.

```
(send a-render-multi set-directory-depth depth) → void?
  depth : exact-nonnegative-integer?
```

Sets the depth of directory structure used when rendering parts that are own their own pages. A value of `0` is treated the same as `1`.

6.4.6 Latex Renderer

```
(require scribble/latex-render)      package: scribble-lib
```

```
render-mixin : (class? . -> . class?)
  argument extends/implements: render<%>
```

Specializes a `render<%>` class for generating Latex input.

```
(extra-character-conversions) → (-> char? (or/c string? #f))
(extra-character-conversions convs) → void?
  convs : (-> char? (or/c string? #f))
```

Function that maps (special) characters to strings corresponding to the Latex code that should be used to render them. This function should return false for any character it does not know how to handle.

Scribble already converts many special characters to the proper Latex commands. This parameter should be used in case you need characters it does not support yet.

6.4.7 Typst Renderer

```
(require scribble/typst-render)      package: scribble-lib
```

```
render-mixin : (class? . -> . class?)
```

argument extends/implements: render<%>

Specializes a render<%> class for generating Typst source. The generated source is self-contained, so rendering does not require a typst executable, but compiling the generated source to PDF requires one.

Code is rendered using Scribble's own token classification: each code style (such as the styles produced by scribble/manual forms) is rendered as a call to a Typst function that is defined by the "racket.typ" file in the "scribble" collection, where the function definitions follow the colors of "racket.css". Because "racket.typ" is included before any style files, a style file (as supplied with --style or ++style) can shadow those definitions with new #let bindings to adjust the rendering of code.

Hyperlinks within the document—including hyperlinks within code—are rendered as Typst labels and references to labels, and section titles include section numbers (as computed by Scribble) as literal text, instead of using Typst's heading-numbering support.

Added in version 1.66 of package scribble-lib.

6.4.8 PDF Renderer

(require scribble/pdf-render) package: scribble-lib

render-mixin : (class? . -> . class?)
argument extends/implements: render<%>

Specializes a render<%> class for generating PDF output via Latex, building on render-mixin from scribble/latex-render.

dvi-render-mixin : (class? . -> . class?)
argument extends/implements: render<%>

Like render-mixin, but generates PDF output via latex, dvips, and pstopdf.

Added in version 1.4 of package scribble-lib.

```
xelatex-render-mixin : (class? . -> . class?)
  argument extends/implements: render<%>
```

Like render-mixin, but generates PDF output via xelatex.

Added in version 1.19 of package scribble-lib.

```
lualatex-render-mixin : (class? . -> . class?)
  argument extends/implements: render<%>
```

Like render-mixin, but generates PDF output via lualatex.

Added in version 1.45 of package scribble-lib.

```
typst-render-mixin : (class? . -> . class?)
  argument extends/implements: render<%>
```

Like render-mixin, but generates PDF output via typst, building on render-mixin from scribble/typst-render.

Added in version 1.66 of package scribble-lib.

6.4.9 Contract (Blue boxes) Renderer

```
(require scribble/contract-render)
```
package: scribble-lib

```
override-render-mixin-multi : (class? . -> . class?)
  argument extends/implements: render<%>
```

Overrides the render method of given renderer to record the content of the blue boxes (generated by defproc, defform, etc) that appear in the document.

```
(send an-override-render-mixin-multi render srcs
                                           dests
                                           ri)   → void?
```

```
srcs : (listof part?)
dests : (listof path?)
ri : render-info?
```

Overrides render in render<%>.

In addition to doing whatever the super method does, also save the content of the blue boxes (rendered via a scribble/text-render renderer).

It saves this information in three pieces in a file inside the *dests* directories called "blueboxes.rktd". The first piece is a single line containing a (decimal, ASCII) number. That number is the number of bytes that the second piece of information occupies in the file. The second piece of information is a hash that maps tag? values to a list of offsets and line numbers that follow the hash table. For example, if the hash maps '(def ((lib "x/main.rkt") abcdef)) to '((10 . 3)), then that means that the documentation for the abcdef export from the x collection starts 10 bytes after the end of the hash table and continues for 3 lines. Multiple elements in the list mean that that tag? has multiple blue boxes and each shows where one of the boxes appears in the file.

```
override-render-mixin-single : (class? . -> . class?)
```
argument extends/implements: render<%>

Just like override-render-mixin-multi, except it saves the resulting files in a different place.

```
(send an-override-render-mixin-single render srcs
                                             dests
                                             ri)   → void?
  srcs : (listof part?)
  dests : (listof path?)
  ri : render-info?
```

Overrides render in render<%>.

Just like render, except that it saves the file "blueboxes.rktd" in the same directory where each *dests* element resides.

6.5 Decoding Text

```
(require scribble/decode)
```
package: scribble-lib

The scribble/decode library helps you write document content in a natural way—more like plain text, except for @ escapes. Roughly, it processes a stream of strings to produces

instances of the scribble/struct datatypes (see §4.7.1 “Compatibility Structures And Processing”).

At the flow level, decoding recognizes a blank line as a paragraph separator. Blocks and paragraphs without blank lines in between are collected into a compound paragraph.

At the content level, decoding makes just a few special text conversions:

- `---`: converted to 'mdash
- `--`: converted to 'ndash
- ``` ``` ```: converted to 'ldquo, which is fancy open quotes: “
- `''`: converted to 'rdquo, which is fancy closing quotes: ”
- `'`: converted to 'rsquo, which is a fancy apostrophe: ’
- ``` ` ```: converted to 'lsquo, which is a fancy quote: ‘

Some functions *decode* a sequence of *pre-flow* or *pre-content* arguments using decode-flow or decode-content, respectively. For example, the bold function accepts any number of *pre-content* arguments, so that in

```
@bold{``apple''}
```

the ``` ``apple'' ``` argument is decoded to use fancy quotes, and then it is bolded.

```
(pre-content? v) → boolean?
  v : any/c
```

Returns #t if *v* is a *pre-content* value: a string or other non-list content, a list of pre-content values, or a splice containing a list of pre-content values; otherwise returns #f.

Pre-content is decoded into content by functions like decode-content and decode-paragraph.

```
(pre-flow? v) → boolean?
  v : any/c
```

Returns #t if *v* is a *pre-flow* value: a string or other non-list content, a block, #<void>, a list of pre-flow values, or a splice containing a list of pre-flow values; otherwise returns #f.

Pre-flow is decoded into a flow (i.e., a list of blocks) by functions like decode-flow.

```
(pre-part? v) → boolean?
  v : any/c
```

Returns #t if v is a *pre-part* value: a string or other non-list content, a block, a part, a title-decl, a part-start, a traverse-part, a part-index-decl, a part-collect-decl, a part-tag-decl, #<void>, a list of pre-part values, or a splice containing a list of pre-part values; otherwise returns #f.

A pre-part sequence is decoded into a part by functions like decode and decode-part.

```
(decode lst) → part?
  lst : (listof pre-part?)
```

Decodes a document, producing a part. In *lst*, lists and instances of splice are inlined into the list, and #<void>s are dropped. An instance of title-decl supplies the title for the part, plus tag, style and version information. Instances of part-index-decl (that precede any sub-part) add index entries that point to the section. Instances of part-collect-decl add elements to the part that are used only during the collect pass. Instances of part-tag-decl add hyperlink tags to the section title. Instances of part-start at level 0 trigger sub-part parsing. Instances of section trigger are used as-is as subsections, and instances of paragraph and other flow-element datatypes are used as-is in the enclosing flow.

As a part is decoded, as long as the style for the part does not include the style property 'hidden or 'no-index, an entry is added to the document index for the part's title. See also decode-current-language-family.

Portions of *lst* are within a part are decoded using decode-flow.

Changed in version 1.25 of package scribble-lib: Added 'no-index support.

```
(decode-part lst tags title depth) → part?
  lst : (listof pre-part?)
  tags : (listof string?)
  title : (or/c #f list?)
  depth : exact-nonnegative-integer?
```

Like decode, but given a list of tag string for the part, a title (if #f, then a title-decl instance is used if found), and a depth for part-starts to trigger sub-part parsing.

```
(decode-flow lst) → (listof block?)
  lst : (listof pre-flow?)
```

Decodes a flow. In *lst*, lists and instances of splice are inlined into the list. A sequence of two or more newlines separated only by whitespace is parsed as a compound-paragraph separator.

Portions of *lst* are within a compound paragraph are decoded using decode-compound-paragraph.

```
(decode-compound-paragraph lst) → block?
  lst : (listof pre-flow?)
```

Decodes a compound paragraph. In *lst*, lists and instances of splice are inlined into the list. Instances of paragraph and other block datatypes are used as-is in the result. If the compound paragraph contains a single block, the block is returned without a compound-paragraph wrapper.

Portions of *lst* that are separated by blocks are decoded using decode-content.

```
(decode-paragraph lst) → paragraph?
  lst : (listof pre-content?)
```

Decodes a paragraph using decode-content to decode *lst* as the paragraph's content.

```
(decode-content lst) → list?
  lst : (listof pre-content?)
```

Decodes content. Elements at the start of the list that are whitespace (according to whitespace?) are dropped. Lists and splices in *lst* are flattened into the list, similarly dropping leading whitespace. Plain strings are decoded; non-string, non-list content is included in the result as-is.

Dropping whitespace in nested lists and splices was a poor implementation choice that is left in place for compatibility. To protect against it, you can exploit the similarly unfortunate fact that an empty list does not count as whitespace.

```
(decode-elements lst) → list?
  lst : (listof pre-content?)
```

An alias for decode-content.

```
(decode-string s) → (listof content?)
  s : string?
```

Decodes a single string to produce content.

```
(whitespace? v) → boolean?
  v : any/c
```

Returns #t if *v* is a string that contains only whitespace, #f otherwise.

```
(struct title-decl (tag-prefix tags version style content)
    #:extra-constructor-name make-title-decl)
  tag-prefix : (or/c #f string? hash?)
  tags : (listof tag?)
  version : (or/c string? #f)
  style : style?
  content : content?
```

See decode and decode-part. The tag-prefix and style fields are propagated to the resulting part. If the version field is not #f, it is propagated as a document-version style property on the part.

```
(struct part-start (depth tag-prefix tags style title)
    #:extra-constructor-name make-part-start)
  depth : integer?
  tag-prefix : (or/c #f string? hash?)
  tags : (listof tag?)
  style : style?
  title : content?
```

Like `title-decl`, but for a sub-part. See `decode` and `decode-part`.

```
(struct part-index-decl (plain-seq entry-seq)
    #:extra-constructor-name make-part-index-decl)
  plain-seq : (listof string?)
  entry-seq : list?
```

See `decode`. The two fields are as for `index-element`.

```
(struct title-decl* title-decl (desc)
    #:extra-constructor-name make-title-decl*)
  desc : index-desc?
(struct part-start* part-start (desc)
    #:extra-constructor-name make-part-start*)
  desc : index-desc?
(struct part-index-decl* part-index-decl (desc)
    #:extra-constructor-name make-part-index-decl*)
  desc : index-desc?
```

Like `title-decl`, `part-start`, and `part-index-decl`, but adds an index-entry description to be propagated to the created `index-element`.

Added in version 1.54 of package `scribble-lib`.

```
(struct part-collect-decl (element)
    #:extra-constructor-name make-part-collect-decl)
  element : (or/c element? part-relative-element?)
```

See `decode`.

```
(struct part-tag-decl (tag)
    #:extra-constructor-name make-part-tag-decl)
  tag : tag?
```

See `decode`.

```
(struct splice (run)
    #:extra-constructor-name make-splice)
  run : list?
```

See decode, decode-part, and decode-flow.

```
(spliceof ctc) → flat-contract?
  ctc : flat-contract?
```

Produces a contract for a splice instance whose run elements satisfy *ctc*.

```
(clean-up-index-string str) → string?
  str : string?
```

Trims leading and trailing whitespace, and converts non-empty sequences of whitespace to a single space character.

```
(decode-current-language-family)
 → (parameter/c (or/c #f (listof string?)))
(decode-current-language-family family) → void?
  family : (parameter/c (or/c #f (listof string?)))
 = #f
```

A parameter that determines how decode creates index entries for document parts. If the parameter value is #f, no language family is associated, otherwise the parameter's value is used for the 'language-family entry description. See also index-desc.

Added in version 1.54 of package scribble-lib.

6.6 Document Language

#lang scribble/doclang2 package: scribble-lib

The scribble/doclang2 language provides everything from racket/base, except that it replaces the #%module-begin form.

The scribble/doclang2 #%module-begin essentially packages the body of the module into a call to decode, binds the result to doc, and exports doc.

Any module-level form other than an expression (e.g., a require or define) remains at the top level, and the doc binding is put at the end of the module. As usual, a module-top-level begin slices into the module top level.

For example:

```
#lang racket
(module example scribble/doclang2
  "hello world, this is"
  " an example document")
(require 'example)
doc
```

The behavior of scribble/doclang2 can be customized by providing #:id, #:post-process, #:begin, and #:exprs arguments at the very beginning of the module.

- #:id names the top-level documentation binding. By default, this is doc.
- #:post-process processes the body of the module after decode. By default, this is values.
- #:begin prepends an additional sequence of expressions to the beginning of the module's body outside of consideration for the document content. For example, the default configure-runtime submodule might be replaced using #:begin, because using #:exprs nests the replacement too deeply to work as an override. By default, this is the empty sequence ().
- #:exprs prepends an additional sequence of expressions to the beginning of the module's body, but after #:begin. By default, this is the empty sequence ().

This example explicitly uses the defaults for all three keywords:

```
#lang racket
(module example scribble/doclang2
  #:id doc
  #:post-process values
  #:exprs ()
  "hello world, this is an example document")
(require 'example)
doc
```

The next toy example uses a different name for the documentation binding, and also adds an additional binding with a count of the parts in the document:

```
#lang racket
(module example scribble/doclang2
  #:id documentation
  #:post-process (lambda (decoded-doc)
                   (set! number-of-parts (length (part-
parts decoded-doc)))
```

```
                  decoded-doc)
  #:exprs ((title "My first expression!"))

  (require scribble/core
           scribble/base)

  (define number-of-parts #f)
  (provide number-of-parts)
  (section "part 1")
  "hello world"
  (section "part 2")
  "this is another document")

(require 'example)
number-of-parts
documentation
```

Changed in version 1.41 of package `scribble-lib`: Added `#:begin`.

6.6.1 scribble/doclang

`#lang scribble/doclang` package: `scribble-lib`

The `scribble/doclang` language provides most of the same functionality as `scribble/doclang2`, where the configuration options are positional and mandatory. The first three elements in the `#%module-begin`'s body must be the `id`, `post-process`, and `exprs` arguments.

Example:

```
#lang racket
(module* example scribble/doclang
  doc
  values
  ()
  (require scribble/base)
  (provide (all-defined-out))
  (define foo (para "hello again"))
  "hello world, this is an example document"
  (para "note the " (bold "structure")))

(module+ main
  (require (submod ".." example))
  (printf "I see doc is: ~s\n\n" doc)
  (printf "I see foo is: ~s" foo))
```

6.7 Document Reader

`#lang scribble/doc` package: `scribble-lib`

The `scribble/doc` language is the same as `scribble/doclang`, except that `read-syntax-inside` is used to read the body of the module. In other words, the module body starts in Scribble "text" mode instead of S-expression mode.

6.8 Cross-Reference Utilities

`(require scribble/xref)` package: `scribble-lib`

The `scribble/xref` library provides utilities for querying cross-reference information that was collected from a document build.

```
(xref? v) → boolean?
  v : any/c
```

Returns `#t` if *v* is a cross-reference record created by `load-xref`, `#f` otherwise.

```
(load-xref  sources
            [#:demand-source-for-use demand-source-for-use
             #:demand-source demand-source
             #:render% using-render%
             #:root root-path
             #:doc-id doc-id-str])
 → xref?
  sources : (listof (-> (or/c any/c (-> list?))))
  demand-source-for-use : (-> tag? symbol? (or/c (-> any/c) #f))
                        = (lambda (tag use-id) (demand-source tag))
  demand-source : (-> tag? (or/c (-> any/c) #f))
                = (lambda (tag) #f)
  using-render% : (implementation?/c render<%>)
                = (render-mixin render%)
  root-path : (or/c path-string? false/c) = #f
  doc-id-str : (or/c path-string? false/c) = #f
```

Creates a cross-reference record given a list of functions, *sources*.

Let *source* be a function in *sources*. The *source* function normally returns serialized information, *info*, which was formerly obtained from `serialize-info` in `render<%>`. The result of *source* can optionally be another function, which is in turn responsible for returning a list of *info*s. Finally, each *info* can be either serialized information, a `#f` to be ignored, or a value produced by `make-data+root` or `make-data+root+doc-id`, from which *data* part is used as serialized information, the *root* part overrides *root-path*

for deserialization, and the *doc-id* part (if any) overrides doc-id-string to identify the source document.

The *demand-source-for-use* function can effectively add a new source to *sources* in response to a search for information on the given tag in the given rendering, where *use-id* is unique to a particular rendering request, a particular transfer (in the sense of xref-transfer-info), or all direct queries of the cross-reference information (such as through xref-binding->definition-tag). The *demand-source-for-use* function should return #f to indicate that no new sources satisfy the given tag for the given *use-id*.

The default *demand-source-for-use* function uses *demand-source*, which is provided only for backward compatibility. Since the *demand-source* function accepts only a tag, it is suitable only when the result of load-xref will only have a single use context, such as a single rendering.

Since the format of serialized information is specific to a rendering class, the optional *using-render%* argument accepts the relevant class. It defaults to HTML rendering, partly because HTML-format information is usable by other formats (including Latex/PDF and text).

If *root-path* is not #f, then file paths that are serialized as relative to an instantiation-supplied *root-path* are deserialized as relative instead to the given *root-path*, but a make-data+root result for any *info* supplies an alternate path for deserialization of the *info*'s *data*.

If *doc-id-str* is not #f, it identifies each cross-reference entry as originating from *doc-id-str*. This identification is used when a rendering link to the cross-reference entry as an external query; see the set-external-tag-path method of render-mixin.

Use load-collections-xref from setup/xref to get all cross-reference information for installed documentation.

Changed in version 1.1 of package scribble-lib: Added the #:doc-id argument.
Changed in version 1.34: Added the #:demand-source-for-use argument.

```
(xref-binding->definition-tag  xref
                               binding
                               mode
                              [#:space space
                               #:suffix suffix])
 → (or/c tag? false/c)
  xref : xref?
```

```
binding : (or/c identifier?
                (list/c (or/c module-path?
                              module-path-index?)
                        symbol?)
                (list/c module-path-index?
                        symbol?
                        module-path-index?
                        symbol?
                        (one-of/c 0 1)
                        (or/c exact-integer? false/c)
                        (or/c exact-integer? false/c))
                (list/c (or/c module-path?
                              module-path-index?)
                        symbol?
                        (one-of/c 0 1)
                        (or/c exact-integer? false/c)
                        (or/c exact-integer? false/c)))
mode : (or/c exact-integer? #f)
space : #f = (or/c symbol? #f)
suffix : space = any/c
```

Locates a tag in *xref* that documents a module export. The binding is specified in one of several ways, as described below; all possibilities encode an exporting module and a symbolic name. The name must be exported from the specified module. Documentation is found either for the specified module or, if the exported name is re-exported from other other module, for the other module (transitively).

The *mode* argument specifies the relevant phase level for the binding. The *binding* is specified in one of four ways:

- If *binding* is an identifier, then `identifier-binding` is used with *mode* to determine the binding.
- If *binding* is a two-element list, then the first element provides the exporting module and the second the exported name. The *mode* argument is effectively ignored.
- If *binding* is a seven-element list, then it corresponds to a result from `identifier-binding` using *mode*.
- If *binding* is a five-element list, then the first element is as for the two-element-list case, and the remain elements are as in the last four elements of the seven-element case.

The *space* argument indicates a binding space (in the sense of `for-space`) to search. The *suffix* argument specifies an additional suffix for the tag, which may be used to distinguish bindings for different spaces or components of a binding.

If a documentation point exists in *xref*, a tag is returned, which might be used with xref-tag->path+anchor or embedded in a document rendered via xref-render. If no definition point is found in *xref*, the result is #f.

Changed in version 1.55 of package scribble-lib: Added the #:space and #:suffix arguments.

```
(xref-tag->path+anchor  xref
                        tag
                       [#:external-root-url root-url
                        #:render% using-render%])
 → (or/c false/c path?)
   (or/c false/c string?)
  xref : xref?
  tag : tag?
  root-url : (or/c string? #f) = #f
  using-render% :  (implementation?/c render<%>)
                = (render-mixin render%)
```

Returns a path and anchor string designated by the key *tag* according the cross-reference *xref*. The first result is #f if no mapping is found for the given tag. The second result is #f if the first result is #f, and it can also be #f if the tag refers to a page rather than a specific point in a page.

If *root-url* is provided, then references to documentation in the main installation are redirected to the given URL.

The optional *using-render%* argument is as for load-xref.

```
(xref-tag->index-entry xref tag) → (or/c false/c entry?)
  xref : xref?
  tag : tag?
```

Extract an entry structure that provides addition information about the definition (of any) referenced by *tag*. This function can be composed with xref-binding->definition-tag to obtain information about a binding, such as the library that exports the binding and its original name.

```
(xref-render  xref
              doc
              dest
             [#:render% using-render%
              #:refer-to-existing-files? use-existing?])
 → (or/c void? any/c)
  xref : xref?
  doc : part?
  dest : (or/c path-string? false/c)
```

```
  using-render% : (implementation?/c render<%>)
                = (render-mixin render%)
  use-existing? : any/c = (not dest)
```

Renders *doc* using the cross-reference info in *xref* to the destination *dest*. For example, *doc* might be a generated document of search results using link tags described in *xref*.

If *dest* is `#f`, no file is written, and the result is an X-expression for the rendered page. Otherwise, the file *dest* is written and the result is `#<void>`.

The optional *using-render%* argument is as for `load-xref`. It determines the kind of output that is generated.

If *use-existing?* is true, then files referenced during rendering (such as image files) are referenced from their existing locations, instead of copying to the directory of *dest*.

```
(xref-transfer-info renderer ci xref) → void?
  renderer : (is-a?/c render<%>)
  ci : collect-info?
  xref : xref?
```

Transfers cross-reference information to *ci*, which is the initially collected information from *renderer*.

```
(xref-index xref) → (listof entry?)
  xref : xref?
```

Converts indexing information *xref* into a list of `entry` structures.

```
(struct entry (words content tag desc)
    #:extra-constructor-name make-entry)
  words : (and/c (listof string?) cons?)
  content : list?
  tag : tag?
  desc : any/c
```

Represents a single entry in a Scribble document index.

The `words` list corresponds to `index-element-plain-seq`. The `content` list corresponds to `index-element-entry-seq`. The `desc` value corresponds to `index-element-desc`. The `tag` is the destination for the index link into the main document.

```
(data+root? v) → boolean?
  v : any/c
(make-data+root data root) → data+root?
  data : any/c
  root : (or/c #f path-string?)
```

A value constructed by make-data+root can be returned by a source procedure for load-xref to specify a path used for deserialization.

```
(data+root+doc-id? v) → boolean?
  v : any/c
(make-data+root+doc-id data root doc-id) → data+root+doc-id?
  data : any/c
  root : (or/c #f path-string?)
  doc-id : string?
```

Extends make-data+root+doc-id to support an document-identifying string (see load-xref).

Added in version 1.1 of package scribble-lib.

6.9 Tag Utilities

```
(require scribble/tag)
```
package: scribble-lib

The scribble/tag library provides utilities for constructing cross-reference tags. The library is re-exported by scribble/base.

```
(make-section-tag name
                  [#:doc doc-mod-path
                   #:tag-prefixes tag-prefixes]) → tag?
  name : string?
  doc-mod-path : (or/c module-path? #f) = #f
  tag-prefixes : (or/c #f (listof string?)) = #f
```

Forms a tag that refers to a section whose "tag" (as provided by the #:tag argument to section, for example) is *name*. If *doc-mod-path* is provided, the tag references a section in the document implemented by *doc-mod-path* from outside the document. Additional tag prefixes (for intermediate sections, typically) can be provided as *tag-prefixes*.

```
(make-module-language-tag lang) → tag?
  lang : symbol?
```

Forms a tag that refers to a section that contains defmodulelang for the language *lang*.

```
(taglet? v) → boolean?
  v : any/c
```

Returns #t if *v* is a taglet, #f otherwise.

A *taglet* is a value that can be combined with a symbol via `list` to form a tag, but that is not a `generated-tag`. A taglet is therefore useful as a piece of a tag, and specifically as a piece of a tag that can gain a prefix (e.g., to refer to a section of a document from outside the document).

```
(doc-prefix mod-path taglet) → taglet?
  mod-path : (or/c #f module-path?)
  taglet : taglet?
(doc-prefix mod-path extra-prefixes taglet) → taglet?
  mod-path : (or/c #f module-path?)
  extra-prefixes : (or/c #f (listof taglet?))
  taglet : taglet?
```

Converts part of a cross-reference tag that would work within a document implemented by *mod-path* to one that works from outside the document, assuming that *mod-path* is not `#f`. That is, *mod-path* is converted to a taglet and added as prefix to an existing *taglet*.

If *extra-prefixes* is provided, then its content is added as a extra prefix elements before the prefix for *mod-path* is added. A `#f` value for *extra-prefixes* is equivalent to `'()`.

If *mod-path* is `#f`, then *taglet* is returned without a prefix (except adding *extra-prefixes*, if provided).

```
(module-path-prefix->string mod-path) → string?
  mod-path : module-path?
```

Converts a module path to a string by resolving it to a path, and using `path->main-collects-relative`.

```
(module-path-index->taglet mpi) → taglet?
  mpi : module-path-index?
```

Converts a module path index to a taglet—a normalized encoding of the path as an S-expression—that is interned via `intern-taglet`.

The string form of the taglet is used as prefix in a tag to form cross-references into the document that is implemented by the module referenced by *mpi*.

```
(intern-taglet v) → any/c
  v : any/c
```

Returns a value that is `equal?` to *v*, where multiple calls to `intern-taglet` for `equal?` *v*s produce the same (i.e., `eq?`) value.

```
(definition-tag->class/interface-tag definition-tag)
 → class/interface-tag?
  definition-tag : definition-tag?
```

Constructs a tag like *definition-tag*, except that it matches documentation for the class. If *definition-tag* doesn't document a class or interface, this function still returns the tag that the class or interface documentation would have had, as if *definition-tag* had documented a class or interface.

Added in version 1.11 of package scribble-lib.

```
(class/interface-tag->constructor-tag class/interface-tag)
 → constructor-tag?
  class/interface-tag : class/interface-tag?
```

Constructs a tag like definition-tag, except that it matches documentation for the constructor of the class.

Added in version 1.11 of package scribble-lib.

```
(get-class/interface-and-method method-tag) → symbol? symbol?
  method-tag : method-tag?
```

Returns the class name and method name (respectively) for the method documented by the docs at *method-tag*.

Added in version 1.11 of package scribble-lib.

```
(definition-tag? v) → boolean?
  v : any/c
```

Recognizes definition tags. If (definition-tag? v) is #t, then so is (tag? v).

Added in version 1.11 of package scribble-lib.

```
(class/interface-tag? v) → boolean?
  v : any/c
```

Recognizes class or interface tags. If (class/interface-tag? v) is #t, then so is (tag? v).

Added in version 1.11 of package scribble-lib.

```
(method-tag? v) → boolean?
  v : any/c
```

Recognizes method tags. If `(method-tag? v)` is `#t`, then so is `(tag? v)`.

Added in version 1.11 of package `scribble-lib`.

```
(constructor-tag? v) → boolean?
  v : any/c
```

Recognizes class constructor tags. If `(constructor-tag? v)` is `#t`, then so is `(tag? v)`.

Added in version 1.11 of package `scribble-lib`.

6.10 Blue Boxes Utilities

```
(require scribble/blueboxes)
```
package: `scribble-lib`

The `scribble/blueboxes` provides access to the content of the "blue boxes" that describe some module's export (but without any styling).

```
(fetch-blueboxes-strs tag
                      [#:blueboxes-cache blueboxes-cache])
 → (or/c #f (non-empty-listof string?))
  tag : tag?
  blueboxes-cache : blueboxes-cache? = (make-blueboxes-cache #t)
```

Returns a list of strings that show the content of the blue box (without any styling information) for the documentation referenced by *tag*.

The first string in the list describes the export (e.g. `"procedure"` when `defproc` is used, or `"syntax"` when `defform` was used to document the export).

```
(fetch-blueboxes-method-tags
  method-name
 [#:blueboxes-cache blueboxes-cache])
 → (listof method-tag?)
  method-name : symbol?
  blueboxes-cache : blueboxes-cache? = (make-blueboxes-cache #t)
```

Returns the list of tags for all methods that are documented in the documentation in *blueboxes-cache*.

Added in version 1.11 of package `scribble-lib`.

```
(make-blueboxes-cache populate?
                      [#:blueboxes-dirs blueboxes-dirs])
```

```
→ blueboxes-cache?
 populate? : boolean?
 blueboxes-dirs : (listof path?) = (get-doc-search-dirs)
```

Constructs a new (mutable) blueboxes cache.

If *populate?* is #f, the cache is initially unpopulated, in which case it is filled in the first time the cache is passed to fetch-bluebxoes-strs. Otherwise, the cache is populated immediately.

The *blueboxes-dirs* argument is a list of directories that are looked inside for "blueboxes.rktd" files. The default value is only an approximation for where those files usually reside. See also get-rendered-doc-directories.

```
(blueboxes-cache? v) → boolean?
  v : any/c
```

Determines if *v* is a blueboxes cache.

6.11 Extending and Configuring Scribble Output

Sometimes, Scribble's primitives and built-in styles are insufficient to produce the output that you need. The cases in which you need to extend or configure Scribble fall into two groups:

- You may need to drop into the back-end "language" of CSS, Latex, or Typst to create a specific output effect. For this kind of extension, you will mostly likely attach a css-addition, tex-addition, or typ-addition style property to style, where the addition implements the style name. This kind of extension is described in §6.11.1 "Implementing Styles".
- You may need to produce a document whose page layout is different from the Racket documentation style. For that kind of configuration, you can run the scribble command-line tool and supply flags like --prefix or ++style, or you can associate a html-defaults, latex-defaults, or typst-defaults style property to the main document's style. This kind of configuration is described in §6.11.2 "Configuring Output".

6.11.1 Implementing Styles

When a string is used as a style in an element, a multiarg-element, paragraph, table, itemization, nested-flow, or compound-paragraph, it corresponds to a CSS class for

HTML output, a Latex macro/environment for Latex output, or a function name for Typst output. In Latex output, the string is used as a command name for a `paragraph` and an environment name for a `table`, `itemization`, `nested-flow`, or `compound-paragraph`; if the style has a `'command` style property for a `nested-flow` or `compound-paragraph`, then the style name is used as a command instead of an environment; and if the style has a `'multicommand` style property for a `nested-flow`, then the style name is used as a command with multiple arguments. In addition, for an itemization, the style string is suffixed with `"Item"` and used as a CSS class or Latex macro name to use for the itemization's items (in place of `\item` in the case of Latex).

To add a mapping from your own style name to a CSS configuration, add a `css-addition` structure instance to a style's style property list. To map a style name to a Latex macro or environment, add a `tex-addition` structure instance. To map a style name to a Typst function, add a `typ-addition` structure instance. A `css-addition`, `tex-addition`, or `typ-addition` is normally associated with the style whose name is implemented by the addition, but it can also be added to the style for an enclosing part.

Scribble includes a number of predefined styles that are used by the exports of `scribble/base`. You can use them or redefine them. The styles are specified by `"scribble.css"`, `"scribble.tex"`, and `"scribble.typ"` in the `"scribble"` collection.

The styles used by `scribble/manual` are implemented by `"racket.css"`, `"racket.tex"`, and `"racket.typ"` in the `"scribble"` collection. Other libraries, such as `scriblib/autobib`, similarly implement styles through files that are associated by `css-addition`, `tex-addition`, and `typ-addition` style properties.

To avoid collisions with future additions to Scribble, start your style name with an uppercase letter that is not `S`. An uppercase letter helps to avoid collisions with macros defined by Latex packages, and future styles needed by `scribble/base` and `scribble/manual` will start with `S`.

For example, a Scribble document

```
#lang scribble/manual
@(require scribble/core
          scribble/html-properties
          scribble/latex-properties)

@(define inbox-style
   (make-style "InBox"
               (list (make-css-addition "inbox.css")
                     (make-tex-addition "inbox.tex")
                     (make-tex-addition "inbox.typ"))))

@title{Quantum Pet}
```

```
Do not open: @elem[#:style inbox-style]{Cat}
```

combined with an `"inbox.css"` that contains

```
.InBox {
  padding: 0.2em;
  border: 1px solid #000000;
}
```

and an `"inbox.tex"` that contains

```
\newcommand{\InBox}[1]{\fbox{#1}}
```

and an `"inbox.typ"` that contains

```
#let InBox(content) = box(inset: 0.2em, stroke: 1pt, content)
```

generates

Quantum Pet

Do not open: Cat

Scribble documents can also embed specific html tags and attributes. For example, this Scribble document:

```
#lang scribble/base

@(require scribble/core
          scribble/html-properties)

@(define external-image
   (elem
    #:style
    (style #f
           (list (alt-tag "img")
                 (attributes
                  '((src . "http://racket-
lang.org/icon.png")))))))

@external-image
```

renders as the the Racket logo at the url `http://racket-lang.org/logo.png` when producing html.

6.11.2 Configuring Output

The implementation of styles used by libraries depends to some degree on separately configurable parameters, and configuration is also possible by replacing style implementations. Latex output is more configurable in the former way, since a document class determines a set of page-layout and font properties that are used by other commands. Typst is similar to Latex in that way. The style-replacement kind of configuration corresponds to overriding CSS class attributes or re-defining Latex commands or shadowing Typst functions. When `raco setup` builds PDF documentation, it uses both kinds of configuration to produce a standard layout for Racket manuals; that is, it selects a particular page layout, and it replaces some `racket/base` styles.

Two kinds of files implement the two kinds of configuration:

- A *prefix file* determines the `DOCTYPE` line for HTML output, the `\documentclass` configuration (and perhaps some addition package uses or other configurations) for Latex output, and a similar prefix for Typst output.

  The default prefix files are `"scribble-prefix.html"`, `"scribble-prefix.tex"`, and `"scribble-prefix.typ"` in the `"scribble"` collection.

- A *style file* refines the implementation of styles used in the document—typically just the "built-in" styles used by `scribble/base`.

  The default style files, `"scribble-style.css"`, `"scribble-style.tex"`, and `"scribble-style.typ"` in the `"scribble"` collection, change no style implementations.

For a given configuration of output, typically a particular prefix file works with a particular style file. Some prefix or style files may be more reusable. For now, reading the default files is the best way to understand how they interact. A prefix and/or style file may also require extra accomanying files; for example, a prefix file for Latex mode may require a corresponding Latex class file. The default prefix and style files require no extra files.

When rendering a document through the `scribble` command-line tool, use flags to select a prefix file, style file, and additional accompanying files:

- Select the prefix file using the `--prefix` flag. (Selecting the prefix file also cancels the default list of accompanying files, if any.)
- Replace the style file using the `--style` flag. Add additional style definitions and re-definitions using the `++style` flag.
- Add additional accompanying files with `++extra`.

When using the `scribble` command-line utility, a document can declare its default style, prefix, and extra files through a `html-defaults`, `latex-defaults`, and/or `typst-defaults` style property. In particular, when using the `scribble` command-line tool to

generate Latex or PDF a document whose main part is implemented with `#lang scribble/manual`, the result has the standard Racket manual configuration, because `scribble/manual` associates a `latex-defaults` style property with the exported document. The `scribble/sigplan` language similarly associates a default configuration with an exported document. As libraries imported with `require`, however, `scribble/manual` and `scribble/sigplan` simply implement new styles in a composable way.

Whether or not a document has a default prefix- and style-file configuration through a style property, the defaults can be overridden using `scribble` command-line flags. Furthermore, languages like `scribble/manual` and `scribble/sigplan` add a `html-defaults`, `latex-defaults`, and/or `typs-defaults` style property to a main-document part only if it does not already have such a property added through the `#:style` argument of `title`.

6.11.3 Base CSS Style Classes

The following renderings of `"demo.scrbl"` demonstrate all of the CSS style classes used by `scribble/base` forms and functions:

- *S1 All-Styles Document, Title in "H2"* shows the default style in a single-page rendering without a search box.
- *M1 All-Styles Document, Title in "H2"* shows the default style in a multi-page rendering without a search box.
- *S2 All-Styles Document, Title in "H2"* shows the current manual style's adjustments in a single-page rendering with a search box.
- *M2 All-Styles Document, Title in "H2"* shows the current manual style's adjustments in a multi-page rendering with a search box.

The style classes:

`maincolumn`	Outer wrapper for all content in the main column.
`main`	Inner wrapper for all content in the main column, including navigation bars.
`refpara`	Outer wrapper for right-hand `margin-note` notes.
`refparaleft`	Outer wrapper for left-hand `margin-note` notes.
`refelem`	Outer wrapper for right `margin-note*` notes.
`refelemleft`	Outer wrapper for left-hand `margin-note*` notes.
`refcolumn`	Middle wrapper for right-hand `margin-note` and `margin-note*` notes.
`refcolumnleft`	Middle wrapper for left-hand `margin-note` and `margin-note*` notes.
`refcontent`	Inner wrapper for `margin-note` and `margin-note*` notes.
`tocset`	Groups table-of-contents panels: main and "on this page."

`tocview`	Wraps the main (multi-page mode) or only (single-page mode) table-of-contents panel.
`tocviewlist`	A hierarchical layer of content in a main table-of-contents panel.
`tocviewlisttopspace`	With `tocviewlist` for the first layer.
`tocviewtoggle`	The always-visible name of a layer.
`tocviewtitle`	With `tocviewtoggle` for the first layer.
`tocviewsublist`	An item in a layer that has multiple items and more items before and after.
`tocviewsublistonly`	An item in a single-item layer.
`tocviewsublisttop`	The first item in a multi-item layer.
`tocviewsublistbottom`	The last item in a multi-item layer.
`tocviewlink`	Inner wrapper for an item in a layer when linked to a different page.
`tocviewselflink`	Inner wrapper for every item in a layer when linked to the same page.
`tocsub`	Wraps the “on this page” (multi-page mode only) table-of-contents panel.
`tocsubtitle`	Wraps the words “on this page”.
`tocsublist`	Inner table for the “on this page” panel.
`tocsublinknumber`	Number for an entry in an “on this page” panel.
`tocsubseclink`	Title for a *section* entry in an “on this page” panel.
`tocsubnonseclink`	Title for a *non-section* entry in an “on this page” panel that has some section links.
`tocsublink`	Title for a *non-section* entry in an “on this page” panel that has no section links.
`toctoplink`	Top-level entry in an inline (not the panel) table of contents.
`toclink`	Nested entry in an inline (not the panel) table of contents.
`versionbox`	Outer wrapper for version
`version`	Inner wrapper for version in the case of search box and/or navigation.
`versionNoNav`	Inner wrapper for version in the case of no search box and navigation.
`SAuthorListBox`	Outer wrapper for the author list.
`SAuthorList`	Inner wrapper for the author list.
`author`	Wrapper for an individual author.
`navsettop`	Wraps the top navigation bar (in multi-page mode or when a search bar is present).
`navsetbottom`	Wraps the bottom navigation bar (in multi-page mode or when a search bar is present).
`navleft`	Wraps left-side elements within a navigation bar.
`navright`	Wraps right-side elements within a navigation bar.
`nonavigation`	Disabled links within a navigation bar.
`searchform`	Outer wrapper for a search box within the top navigation bar.
`searchbox`	Inner wrapper for a search box within the top navigation bar.
`nosearchform`	Takes the place of an absent search box within the top navigation bar.
`SsectionLevel1`	`<section>` tag enclosing the part introduced by `title`.
`SsectionLevel2`	`<section>` tag enclosing a part introduced by `section`.
`SsectionLevel3`	`<section>` tag enclosing a part introduced by `subsection`.
`SsectionLevel4`	`<section>` tag enclosing a part introduced by `subsubsection`.
`SSubSubSubSection`	Deeply nested subsection heading (below `<h4>`).

`SIntrapara`	Used with `<div>` instead of `<p>` for a paragraph within a `compound-paragraph`.
`SubFlow`	For a `nested-flow` with no style name: no inset.
`SCodeFlow`	For a `nested-flow` with the `'code-inset` style name: inset suitable for code.
`SVInsetFlow`	For a `nested-flow` with the `'vertical-inset` style name: add space before and after suitable for code.
`SCentered`	For a `nested-flow` created by `centered`: horizontally centered.
`SVerbatim`	For a `table` created by `verbatim`: disables line breaks.
`boxed`	For a `table` with the `'boxed` style name: as a definition box.
`compact`	For an `itemlist` with the `'compact` style name.
`techoutside`	Outer wrapper for a technical-term reference.
`techinside`	Inner wrapper for a technical-term reference.
`indexlink`	For an entry in the index.
`stt`	Fixed-width text.
`sroman`	Serif text.
`ssanserif`	Sans serif text.
`slant`	Oblique (as opposed to italic) text.
`Smaller`	Smaller text (as created by `smaller`).
`Larger`	Smaller text (as created by `larger`).
`hspace`	For whitespace produced by `hspace`.
`nobreak`	Disable link breaks.
`badlink`	Broken cross-reference.
`plainlink`	Hyperlink without an underline.

In addition, the `<section>` tags are given `id`s of the form `id="section <n>"`, where `<n>` is the section or subsection or subsubsection number. For example, the second Scribble `section` has an html `<section>` tag with an `id` of `"section 2"`, and the first Scribble `subsection` of the second Scribble `section` has an html `<section>` tag with an `id` of `"section 2.1"`.

6.11.4 Manual CSS Style Classes

The following renderings of `"demo-manual.scrbl"` demonstrate all of the CSS style classes used by `scribble/manual` forms and functions in addition to the base style classes.

- *S1 Manual All-Styles Document* shows the original style in a single-page rendering without a search box.
- *M1 Manual All-Styles Document* shows the original style in a multi-page rendering without a search box.

- *S2 Manual All-Styles Document* shows the current manual style's adjustments in a single-page rendering with a search box.
- *M2 Manual All-Styles Document* shows the current manual style's adjustments in a multi-page rendering with a search box.

The style classes:

`RktSym`	Identifiers with no `for-label` binding.
`RktValLink`	Identifier with `for-label` binding to a variable definition.
`RktValDef`	Definition site of a variable, normally combined with `RktValLink`.
`RktStxLink`	Identifier with `for-label` binding to a syntactic-form definition.
`RktStxDef`	Definition site of a syntactic form, normally combined with `RktStxLink`.
`RktSymDef`	Definition site of an identifier without binding (normally a mistake), combined with `RktSym`.
`RktVar`	Local variable or meta-variable.
`RktRes`	REPL result.
`RktOut`	Output written to the current output port.
`RktErr`	Output written to the current error port.
`RktCmt`	A comment in Racket code.
`RktVal`	A literal value in Racket code.
`RktPn`	Parentheses, keywords, and similar delimiters in Racket code.
`RktRdr`	Reader shorthands in Racket code, except for commas.
`RktMeta`	An unquoting comma in Racket code.
`highlighted`	Hilighlted code (via `code:highlight` in `racketblock`, for example).
`RktIn`	Foreground for literal characters written with `litchar`.
`RktInBG`	Background for literal characters written with `litchar`.
`RktModLink`	A module name linked to the module's definition.
`RktMod`	A module name (normally `RktModLink`, instead).
`RktKw`	A "keyword;" not normally used.
`RktOpt`	Brackets for optional arguments (in function definitions).
`RktBlk`	Wrapper for multi-linke Racket code blocks.
`defmodule`	Module definition block.
`RpackageSpec`	Package specification within a module-definition block.
`RBoxed`	Definition block; always combined with `boxed`.
`together`	Table within a `together` grouping.
`RBackgroundLabel`	Wrapper for "procedure," "syntax," etc., backing in a definition box.
`RBackgroundLabelInner`	Wrapper within `RBackgroundLabel`.
`RForeground`	Wrapper for element to appear over a `RBackgroundLabel`.
`prototype`	Wrapper for a multi-line procedure-definition prototype.
`argcontract`	Wrapper for a multi-line argument contract and default value.
`specgrammar`	Wrapper for a grammar with a syntactic-form definition box.
`inherited`	Wrapper for a margin "inherited methods" table.
`inheritedlbl`	Wrapper for "Inherited methods:" and "from" labels.

`leftindent`	Left-indented block, such as form `specsubform`.
`insetpara`	Inset block.
`Rfilebox`	Wrapper for a file box (via `filebox`),
`Rfiletitle`	Outer wrapper for a file box title.
`Rfilename`	Inner wrapper for a file box title.
`Rfilecontent`	Wrapper for file box content.
`SHistory`	Wrapper for `history` paragraphs.
`RBibliography`	Wrapper for a `bibliography` section.

6.11.5 Latex Commands

The `"scribble.tex"` Latex configuration includes several commands and environments that you can redefine to adjust the output style:

- `\preDoc` — called before the document content; the default does nothing, while the `scribble/manual` configuration enabled `\sloppy`.
- `\postDoc` — called after the document content; the default does nothing.
- A set of commands that control the basic set of Latex packages that are loaded:
  - `\packageGraphicx`, defaults to `\usepackage{graphicx}`
  - `\packageHyperref`, defaults to `\usepackage{hyperref}`
  - `\renewrmdefault`, defaults to `\renewcommand{\rmdefault}{ptm}`
  - `\packageRelsize`, defaults to `\usepackage{relsize}`
  - `\packageAmsmath`, defaults to `\usepackage{amsmath}`
  - `\packageMathabx`, defaults to `\usepackage{mathabx}`
  - `\packageWasysym`, defaults to `\let\leftmoon\relax \let\rightmoon\relax \let\fullmoon\relax \let\newmoon\relax \let\diameter\relax \usepackage[nointegrals]{wasysym}`
  - `\packageTxfonts`, defaults to `\let\widering\relax \usepackage{newtxmath}`
  - `\packageTextcomp`, defaults to `\usepackage{textcomp}`
  - `\packageFramed`, defaults to `\usepackage{framed}`
  - `\packageHyphenat`, defaults to `\usepackage[htt]{hyphenat}`
  - `\packageColor`, defaults to `\usepackage[usenames,dvipsnames]{color}`
  - `\doHypersetup`, defaults to `\hypersetup{bookmarks=true,bookmarksopen=true,bookmarksnumbered`

  - `\packageTocstyle`, defaults to `\IfFileExists{tocstyle.sty}{\usepackage{tocstyle}\usetocstyl`
  - `\packageCJK`, defaults to `\IfFileExists{CJK.sty}{\usepackage{CJK}}{}`

  Changed in version 1.36: Added `\packageTxfonts`

  Changed in version 1.37: Added `\packageAmsmath`; changed `\packageWasysym` to use `nointegrals` option; changed `\packageTxfonts` to load `newtxmath`. Note that documents could look different due to the new `wasysym` option and the inclusion of `newtxmath`. See racket/scribble#274 for examples.

- `\sectionNewpage` — called before each top-level section starts; the default does nothing, while the `scribble/manual` configuration uses `\newpage` to start each chapter on a new page.

- `\SecRefLocal{}{}{}` — the first argument is a Latex label, the second argument is a section number, and the third argument is a section title. This macro is used by `secref` to reference a section (other than a document or top-level section within a document) that has a number and that is local to the current document. The default expands to `\SecRef`, passing along just the second and third arguments (so that the label is ignored).

- `\SecRef{}{}` — like `\SecRefLocal`, but used when the referenced section is in a different document, so that no label is available. The default shows "section" followed by the section number (ignoring the title). The `scribble/manual` redefinition of this macro shows "§", the section number, and the title in quotes.

- `\ChapRefLocal{}{}{}` and `\ChapRef{}{}` — like `\SecRefLocal` and `\SecRef`, but for a top-level section within a document. The default implementation defers to `\SecRefLocal` or `\SecRef`.

- `\PartRefLocal{}{}{}` and `\PartRef{}{}` — like `\SecRefLocal` and `\SecRef`, but for a top-level section within a document whose part has the `'grouper` style property. The default `\PartRef` shows "part" followed by the section number (ignoring the title).

- `\BookRefLocal{}{}{}` and `\BookRef{}{}` — like `\SecRefLocal` and `\SecRef`, but for a document (as opposed to a section within the document). The default `\BookRef` implementation shows the title in italic.

- `\SecRefLocalUC{}{}{}` and `\SecRefUC{}{}` — like `\SecRefLocal` and `\SecRef`, but for `Secref`. The default `\SecRefUC` shows "Section" followed by the section number.

- `\ChapRefLocalUC{}{}{}` and `\ChapRefUC{}{}` — like `\ChapRefLocal` and `\ChapRef`, but for `Secref`. The default `\ChapRefUC`implementation defers to `\SecRefUC`.

- `\PartRefLocalUC{}{}{}` and `\PartRefUC{}{}` — like `\PartRefLocal` and `\PartRef`, but for `Secref`. The default `\PartRefUC` shows "Part" followed by the section number.

- \BookRefLocalUC{}{}{} and \BookRefUC{}{} — like \BookRefLocal and \BookRef, but for Secref. The default \BookRefUC defers to \BookRef.

- \SecRefLocalUN{}{}, \SecRefUCUN{}, \SecRefLocalUCUN{}{}, \SecRefUN{}, \PartRefLocalUN{}{}, \PartRefUN{}, \PartRefLocalUCUN{}{}, \PartRefUCUN{}, \BookRefLocalUN{}{}, \BookRefUN{}, \BookRefLocalUCUN{}{}, \BookRefUCUN{}, \ChapRefLocalUN{}{}, \ChapRefUN{}, \ChapRefLocalUCUN{}{}, and \ChapRefUCUN{} — like \SecRefLocal, etc., but in the case that a section/part/chapter number is unavailable. The default implementation of \BookRefUN uses \BookRef with an empty first argument. The default \SecRefLocalUN expands to its second argument in quotes followed by "on page" as a \pageref using the first argument, while the default \SecRefUN expands to its only argument in quotes. The default \PartRef and \ChapRef variants expand to the corresponding \SecRef variant.

- \Ssection{}{}, \Ssubsection{}{}, \Ssubsubsection{}{}, \Ssubsubsubsection{}{}, \Ssubsubsubsubsection{}{} — for a top-level section, a second-level section, etc., where the last variant is used for all sections that are deeper than four levels. The first argument corresponds to the optional argument to \section, which is used for the table of contents. Furthermore, \SNextTitlePlain is called before each of these to register a plain-text version of the title suitable for use in table-of-contents metadata, such as in PDF. The default versions of these commands use that plain text via \STexOrPDFTitle.

- \Ssectionstar{}, \Ssubsectionstar{}, \Ssubsubsectionstar{}, \Ssubsubsubsectionstar{}, \Ssubsubsubsubsectionstar{} — like \Ssection, etc., but for unnumbered sections that are omitted from the table of contents.

- \Ssectionstarx{}{}, \Ssubsectionstarx{}, \Ssubsubsectionstarx{}{}, \Ssubsubsubsectionstarx{}{}, \Ssubsubsubsubsectionstarx{}{} — like \Ssection, etc., but for unnumbered sections (that nevertheless appear in the table of contents).

- \Sincsection, \Sincsubsection, \Sincsubsubsection, \Sincsubsubsubsection, \Sincsubsubsubsubsection — increments the section counter.

- \Spart{}{}, \Spartstar{}, \Spartstarx{}{}, \Sincpart — like the section commands, but used for in place of \Ssection{}{}, \Ssectionstar{}, etc. for a part with the 'grouper style property.

- \SNextTitlePlain{}, \STexOrPDFTitle{} — Used to record and/or access a plain-text version of a title. The \STexOrPDFTitle macro expands to either its given text of the recorded plain text, depending on how it is used, similar to using \texorpdfstring for the optional argument to \section.

- SInsetFlow environment — for a nested-flow with the 'inset style name.

- SCodeFlow environment — for a nested-flow with the 'code-inset style name.

- `SVInsetFlow` environment — for a `nested-flow` with the `'vertical-inset` style name.
- `SVerbatim` environment — for a `table` created by `verbatim`.
- `\SCodeBox{}`, `\SVInsetBox{}` — for a `nested-flow` with the `'code-inset` or `'vertical-inset` style name, respectively, and as the content of a table cell. The content is installed into a TeX box using `\setbox1`.

Additionally, the `"racket.tex"` Latex configuration includes several commands that you can redefine to adjust the output style of Racket code:

- `\SColorize{}{}` — Sets the color scheme of Racket code. Can be redefined to create black and white code. The first argument is the requested color, and the second argument is the text for that color.
- `\SHyphen{}` — Enables or Disables the ability for identifiers and keywords in Racket code from being hyphenated. Defaults to enabled (for compatibility). Redefine to disable or change the hyphenation behavior. For example, to cause the text to overfill rather than hyphen, it can be redefined to: `\renewcommand{\SHyphen}[1]{\mbox{#1}}`. The first argument is an identifier or keyword inside of a code block.

6.11.6 Latex Prefix Support

```
(require scribble/latex-prefix)
```
package: `scribble-lib`

Provides a string that is useful for constructing a Latex document prefix.

```
unicode-encoding-packages : string?
```

A string containing Latex code that is useful after a `\documentclass` declaration to make Latex work with Unicode characters.

6.11.7 Typst Functions

The `"scribble.typ"` Typst configuration defines several functions and state objects that you can shadow to adjust the output style:

- `Stitle(title: [], version: none, authors: none, date: none)` — for the title of a document.
- `SVersion(version)` — for a version, adding “Version” as a prefix to the given version content.

- `Sheading(depth: none, outlined: true, hidden: false, content)` — for a section heading at a given depth.
- `SSubSubSubSection(content)` — for a `subsubsub*section`
- `SttProc` state — a function that takes content and typesets it with a fixed-width font
- `SInset(body)` — for a `nested-flow` with the `'inset` style name.
- `SCodeInset(body)` — for a `nested-flow` with the `'code-inset` style name.
- `SVerticalInset(body)` — for a `nested-flow` with the `'vertical-inset` style name.
- `Stable(columns: [], ..content)` — for a `table`.
- `Ssoxed(columns: [], ..content)` — for a `table` with the `'boxed` style.
- `SVerbatim(columns: [], ..content)` — for a `table` created by `verbatim`.

Additionally, the `"racket.typ"` Typst configuration defines several functions that you can redefine to adjust the output style of Racket code:

- `RktBlk(columns: [], ..content)` — for a `table` created by `racketblock`.
- `RktPlain(body)` — uncolored text within `racket`, `racketblock`, etc. A number of other functions, such as `RktPn`, are also defined, analogous to the classes listed in §6.11.4 “Manual CSS Style Classes”.
- `SColorizeOn` state — a boolean that determines whether color is used for `racket`, `racketblock`, etc. content. This state is consulted by functions like `RktPn`.

7 Running `scribble`

The `scribble` command-line tool (also available as `raco scribble`) runs a Scribble document and renders it to a specific format. Select a format with one of the following flags, where the output name *fn* is by default the document source name without its file suffix:

- `--html` — a single HTML page "*fn*`.html`", plus CSS sources and needed image files; this mode is the default if no format is specified
- `--htmls` — multiple HTML pages (and associated files) in a "*fn*" directory, starting with "*fn*`/index.html`"
- `--html-tree` ⟨*n*⟩ — HTML pages in a directory tree up to ⟨*n*⟩ layers deep; a tree of depth `0` is equivalent to using `--html`, and a tree of depth `1` is equivalent to using `--htmls`
- `--latex` — LaTeX source "*fn*`.tex`", plus any needed additional files (such as non-standard class files) needed to run `latex` or `pdflatex`
- `--pdf` — PDF "*fn*`.pdf`" that is generated via `pdflatex`
- `--xelatex` — PDF "*fn*`.pdf`" that is generated via `xelatex`
- `--lualatex` — PDF "*fn*`.pdf`" that is generated via `lualatex`
- `--dvipdf` — PDF "*fn*`.pdf`" that is generated via `latex`, `dvips`, and `pstopdf`
- `--latex-section` ⟨*n*⟩ — LaTeX source "*fn*`.tex`" plus additional "`.tex`" files to be included in the enclosing document's preamble, where the enclosing document must use the UTF-8 input encoding and T1 font encoding; use `1` for ⟨*n*⟩ to make the rendered document a section, `2` for a subsection, etc.
- `--text` — plain text in a single file "*fn*`.txt`", with non-ASCII content encoded as UTF-8
- `--markdown` — Markdown text in a single file "*fn*`.md`", with non-ASCII content encoded as UTF-8
- `--typst` — Typst source "*fn*`.typ`", plus any needed image files
- `--typst-pdf` — PDF "*fn*`.pdf`" that is generated via `typst`

Use `--dest-name` to specify a *fn* other than the default name, but only when a single source file is provided. Use the `--dest` flag to specify a destination directory (for any number of source files). Use `--dest-base` to add a prefix to the name of each support file that is generated or copied to the destination; the prefix can contain a directory path, and a non-directory ending element is used as a prefix on a support-file name. Use `--keep-at-dest-base` to avoid overwriting existing files with support files (but existing files are used when the content matches what would be written otherwise).

After all flags, provide one or more document sources, where each source declares a module. The module should either have a `doc` submodule that exports `doc` as a `part`, or it should directly export `doc` as a `part`. (The submodule is tried first, and the main module is not directly loaded or evaluated if the submodule can be loaded on its own.) Use `--doc-binding` to access an alternate exported name in place of `doc`.

When multiple documents are rendered at the same time, cross-reference information in one document is visible to the other documents. See §7.2 "Handling Cross-References" for information on references that cross documents that are built separately.

Changed in version 1.4: Added `--dvipdf`.
Changed in version 1.18: Added `--doc-binding`.
Changed in version 1.19: Added `--xelatex`.
Changed in version 1.40: Added `--keep-at-dest-base` and fixed `--dest-base` to work correctly for HTML output.
Changed in version 1.45: Added `--lualatex`.
Changed in version 1.66: Added `--typst` and `--typst-pdf`.

7.1 Extra and Format-Specific Files

Use the `--style` flag to specify a format-specific file to adjust the output style file for certain formats. For HTML (single-page or multi-page) output, the style file should be a CSS file that is applied after all other CSS files, and that may therefore override some style properties. For Latex (or PDF) output, the style file should be a `".tex"` file that can redefine Latex commands. For Typst output, the style file should be a `".typ"` file whose content is included after the prefix file, so it can override `set` and `show` rules from the prefix. When a particular Scribble function needs particular CSS or Latex support, however, a better option is to use a `css-addition` or `tex-addition` style property so that the support is included automatically; see §6.11 "Extending and Configuring Scribble Output" for more information.

In rare cases, use the `--style` flag to specify a format-specific base style file. For HTML (single-page or multi-page) output, the style file should be a CSS file to substitute for `"scribble.css"` in the `"scribble"` collection. For Latex (or PDF) output, the style file should be a `".tex"` file to substitute for `"scribble.tex"` in the `"scribble"` collection. The `--style` flag is rarely useful, because the content of `"scribble.css"` or `"scribble.tex"` is weakly specified; replacements must define all of the same styles, and the set of styles can change across versions of Racket.

Use `--prefix` to specify an alternate format-specific start of the output file. For HTML output, the starting file specifies the `DOCTYPE` declaration of each output HTML file as a substitute for `"scribble-prefix.html"` in the `"scribble"` collection. For Latex (or PDF) output (but not Latex-section output), the starting file specifies the `\documentclass` declaration and initial `\usepackage` declarations as a substitute for `"scribble-prefix.tex"` in the `"scribble"` collection. For Typst output, the starting file specifies document-level

`set` rules as a substitute for `"scribble-prefix.typ"` in the `"scribble"` collection. See also `html-defaults`, `latex-defaults`, and §6.11 “Extending and Configuring Scribble Output”.

For any output form, use the `++extra` flag to add a needed file to the build destination, such as an image file that is referenced in the generated output but not included via `image` (which copies the file automatically).

7.2 Handling Cross-References

Cross references within a document or documents rendered together are always resolved. When cross references span documents that are rendered separately, cross-reference information needs to be saved and loaded explicitly. Cross-reference information is format-specific, but HTML-format information is usable for Latex (or PDF) or text rendering.

A Racket installation includes HTML-format cross-reference information for all installed documentation. Each document’s information is in a separate file, so that loading all relevant files would be tedious. The `+m` or `++main-xref-in` flag loads cross-reference information for all installed documentation, so

```
scribble +m mine.scrbl
```

renders `"mine.scrbl"` to `"mine.html"` with cross-reference links to the Racket installation’s documentation. (The `"racket-index"` package must be installed to use `+m`/`++main-xref-in`.)

The `++xref-in` flag loads cross-reference information by calling a specified module’s function. The `setup/xref` module provides `load-collections-xref` to load cross-reference information for all installed documentation, and `+m` or `++main-xref-in` is just a shorthand for `++xref-in setup/xref load-collections-xref`.

The `--redirect-main` flag for HTML output redirects links to the local installation’s documentation (not user-scope documentation) to a given URL, such as `http://docs.racket-lang.org/`. Beware that documentation links sometimes change (although Scribble generates HTML paths and anchors in a relatively stable way), so `http://download.racket-lang.org/releases/`*version*`/doc/` may be more reliable when building with an installation for *version*. The `--redirect-main` flag is ignored for non-HTML output.

The `--redirect` flag is like `--redirect-main`, except that it builds on the given URL to indicate a cross-reference tag that is more stable than an HTML path and anchor (in case the documentation for a function changes sections, for example), and it can generate redirected linked for documentation that is installed in user scope. The URL `https://docs.racket-lang.org/local-redirect/index.html` can work for these redirections.

For cross-references among documentation that is not part of the Racket installation, use

`--info-out` to save information from a document build and use `++info-in` to load previously saved information. For example, if `"c.scrbl"` refers to information in `"a.scrbl"` and `"b.scrbl"`, then

```
scribble --info-out a.sxref a.scrbl

scribble --info-out b.sxref b.scrbl

scribble ++info-in a.sxref ++info-in b.sxref c.scrbl
```

builds `"c.html"` with cross-reference links into `"a.html"` and `"b.html"`.

When building a document that is normally installed as part of a package, referring to the document by its filesystem path may produce different cross-reference linking than running the document via `raco setup`. The difference is in the way relative-path imports are resolved, especially with `for-label`. A relative-path reference counts as a filesystem-path reference when starting from a mofule that is itself referenced through a filesystem path, or it counts as collection-based module path when referenced from a module that is itself referenced using a collection-based path. Use the `--lib`/`-l` flag to refer to a document with a module path instead of a filesystem path.

Changed in version 1.47: Added the `--lib`/`-l` flag.

7.3 Selecting an Image Format

Use the `++convert` ⟨*fmt*⟩ flag to select ⟨*fmt*⟩ as a preferred image format to use when rendering a document that includes values that can be converted to different image formats. The ⟨*fmt*⟩ argument can be `pdf`, `ps`, `png`, `svg`, or `gif`, but a renderer typically supports only a subset of those formats.

Use `++convert` ⟨*fmt*⟩ multiple times to specify multiple preferred formats, where a ⟨*fmt*⟩ earlier in the command line take precedence over ⟨*fmt*⟩s specified later.

For example, to generate Latex sources with images in Encapsulated PostScript format (so that the result works with `latex` instead of `pdflatex`), combine `--latex` with `++convert ps`. To generate HTML pages with images converted to SVG format instead of PNG format, combine `--html` with `++convert svg`.

Changed in version 1.4: Added `++convert` support.

7.4 Passing Command-Line Arguments to Documents

When `scribble` loads and renders a document module, by default it sets `current-command-line-arguments` to an empty vector. Use the `++arg` flag (any number of times)

to add a string to `current-command-line-arguments`.

For example,

```
scribble ++arg --mode ++arg fast turtle.scrbl
```

causes `(current-command-line-arguments)` to return `'#("--mode" "fast")` while `"turtle.scrbl"` is loaded and rendered, which could affect the content that `"turtle.scrbl"` generates if it uses `current-command-line-arguments`.

Changed in version 1.1: Added the empty-vector default and `++arg` flag.

7.5 Additional Options

- `--quiet` — suppress output-file and undefined-tag reporting
- `--make` or `-y` — Enable automatic generation and update of compiled `".zo"` files when loading document modules. Specifically, the result of `(make-compilation-manager-load/use-compiled-handler)` is installed as the value of `current-load/use-compiled` while loading a module.
- `--doc-binding` ⟨*id*⟩ — render document provided as ⟨*id*⟩ instead of `doc`
- `--errortrace` — enable `errortrace`

Changed in version 1.38: Added the `--errortrace` flag.
Changed in version 1.44: Added the `--make/-y` flag.

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