MzLib: Legacy Libraries

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The "mzlib" collection contains wrappers and libraries for compatibility with older versions of Racket. In many ways, the libraries of the "mzlib" collection go with the mzscheme legacy language. Newer variants of many libraries reside in the "racket" collection.

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1 mzlib/a-signature

(require mzlib/a-signature) package: compatibility-lib

NOTE: This library is deprecated; use racket/signature, instead.

Like scheme/signature in #lang form for defining a single signature within a module, but based on mzscheme instead of scheme/base.

2 mzlib/a-unit

```
(require mzlib/a-unit)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/unit, instead.

Like scheme/unit in #lang form for defining a single unit within a module, but based on mzscheme instead of scheme/base.

3 mzlib/async-channel

```
(require mzlib/async-channel)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/async-channel, instead.

Re-exports scheme/async-channel.

4 mzlib/awk

(require mzlib/awk) package: compatibility-lib

```
(awk next-record-expr
     (record field-id ...)
     maybe-counter
     ((state-variable init-expr) ...)
     maybe-continue
  clause ...)

  maybe-counter =
                | id

 maybe-continue =
                | id

         clause = (test body ...+)
                | (test => procedure-expr)
                | (/ regexp-str / (id-or-false ...+) body ...+)
                | (range excl-start-test excl-stop-test body ...+)
                | (:range incl-start-test excl-stop-test body ...+)
                | (range: excl-start-test incl-stop-test body ...+)
                | (:range: incl-start-test incl-stop-test body ...+)
                | (else body ...+)
                | (after body ...+)

           test = integer
                | regexp-string
                | expr

excl-start-test = test

 excl-stop-test = test

incl-start-test = test

 incl-stop-test = test

    id-or-false = id
                | #f
```

The awk macro from Scsh [Shivers06]. In addition to awk, the Scsh-compatible procedures match:start, match:end, match:substring, and regexp-exec are defined. These match: procedures must be used to extract match information in a regular expression clause

when using the => form.

```
(match:start rec [which]) → exact-nonnegative-integer?
  rec : ....
  which : exact-nonnegative-integer? = 0
(match:end rec [which]) → exact-nonnegative-integer?
  rec : ....
  which : exact-nonnegative-integer? = 0
(match:substring rec [which]) → string?
  rec : ....
  which : exact-nonnegative-integer? = 0
```

Extracts a start position, end position, or substring corresponding to a match. The first argument is the value supplied to the procedure after => in a `awk` clause or the result of `regexp-exec`.

```
(regexp-exec re s) → (or/c .... false/c)
  re : (or/c string? regexp?)
  s : string?
```

Matches a regexp to a string, returning a record compatible with `match:start`, etc.

5 mzlib/class

(require mzlib/class) package: compatibility-lib

NOTE: This library is deprecated; use racket/class, instead.

Re-exports scheme/class, except for the contract constructors.

6 mzlib/cm

`(require mzlib/cm)` package: `compatibility-lib`

NOTE: This library is deprecated; use `compiler/cm`, instead.

Re-exports `compiler/cm`.

7 mzlib/cm-accomplice

(require mzlib/cm-accomplice) package: compatibility-lib

NOTE: This library is deprecated; use compiler/cm-accomplice, instead.

Re-exports compiler/cm-accomplice.

8 mzlib/cmdline

```
(require mzlib/cmdline)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/cmdline, instead.

Provides a command-line from that is similar to the one in racket/cmdline, but without using keywords. The parse-command-line procedure from racket/cmdline is re-exported directly.

```
(command-line program-name-expr argv-expr clause ...)

     clause = (multi flag-spec ...)
            | (once-each flag-spec ...)
            | (once-any flag-spec ...)
            | (final flag-spec ...)
            | (help-labels string ...)
            | (args arg-formals body-expr ...+)
            | (=> finish-proc-expr arg-help-expr help-proc-expr
                unknown-proc-expr)

  flag-spec = (flags id ... help-str ...+ body-expr ...+)
            | (flags => handler-expr help-expr)

      flags = flag-string
            | (flag-string ...+)

arg-formals = id
            | (id ...)
            | (id ...+ . id)
```

Like command-line from racket/cmdline, but without keywords in the syntax.

9 mzlib/cml

```
(require mzlib/cml)
```
package: compatibility-lib

The mzlib/cml library defines a number of procedures that wrap Racket concurrency procedures. The wrapper procedures have names and interfaces that more closely match those of Concurrent ML [Reppy99].

```
(spawn thunk) → thread?
  thunk : (-> any)
```

Equivalent to (thread/suspend-to-kill thunk).

```
(channel) → channel?
```

Equivalent to (make-channel).

```
(channel-recv-evt ch) → evt?
  ch : channel?
```

Equivalent to ch.

```
(channel-send-evt ch v) → evt?
  ch : channel?
  v : any/c
```

Equivalent to (channel-put-evt ch v).

```
(thread-done-evt thd) → any
  thd : thread?
```

Equivalent to (thread-dead-evt thread).

```
(current-time) → real?
```

Equivalent to (current-inexact-milliseconds).

```
(time-evt tm) → evt?
  tm : real?
```

Equivalent to (alarm-evt tm).

10 mzlib/compat

```
(require mzlib/compat)
```
package: compatibility-lib

The mzlib/compat library defines a number of procedures and syntactic forms that are commonly provided by other Scheme implementations. Most of the procedures are aliases for mzscheme procedures.

```
(=? n ...+) → boolean?
  n : number?
(<? n ...+) → boolean?
  n : real?
(>? n ...+) → boolean?
  n : real?
(<=? n ...+) → boolean?
  n : real?
(>=? n ...+) → boolean?
  n : real?
```

Same as =, <, etc.

```
(1+ n) → number?
  n : number?
(1- n) → number?
  n : number?
```

Same as add1 and sub1.

```
(gentmp [base]) → symbol?
  base : (or/c string? symbol?) = "g"
```

Same as gensym.

```
(flush-output-port [o]) → void?
  o : output-port? = (current-output-port)
```

Same as flush-output.

```
(real-time) → exact-integer?
```

Same as current-milliseconds.

```
(atom? v) → any
  v : any/c
```

Same as `(not (pair? v))` (which does not actually imply an atomic value).

```
(define-structure (name-id field-id ...))
(define-structure (name-id field-id ...)
                  ((init-field-id init-expr) ...))
```

Like `define-struct`, except that the *name-id* is moved inside the parenthesis for fields. In addition, *init-field-id*s can be specified with automatic initial-value expression.

The *init-field-id*s do not have corresponding arguments for the `make-`*name-id* constructor. Instead, each *init-field-id*'s *init-expr* is evaluated to obtain the field's value when the constructor is called. The *field-id*s are bound in *init-expr*s, but not other *init-field-id*s.

Examples:

```
> (define-structure (add left right) ([sum (+ left right)]))
> (add-sum (make-add 3 6))
9
```

```
(getprop sym property [default]) → any/c
  sym : symbol?
  property : symbol?
  default : any/c = #f
(putprop sym property value) → void?
  sym : symbol?
  property : symbol?
  value : any/c
```

The `getprop` function gets a property value associated with *sym*. The *property* argument names the property to be found. If the property is not found, *default* is returned.

The properties obtained with `getprop` are the ones installed with `putprop`.

```
(new-cafe [eval-handler]) → any
  eval-handler : (any/c . -> . any) = #f
```

Emulates Chez Scheme's `new-cafe` by installing *eval-handler* into the `current-eval` parameter while running `read-eval-print`. In addition, `current-exit` is set to escape from the call to `new-cafe`.

11 mzlib/compile

(require mzlib/compile) package: compatibility-lib

Re-exports compile-file from compiler/compile-file.

12 mzlib/contract

```
(require mzlib/contract)
```
package: compatibility-lib

> **NOTE:** This library is deprecated; use racket/contract, instead. This library is designed as a backwards compatible library for old uses of contracts. It should not be used for new libraries.

The main differences: the function contract syntax is more regular and function contracts now support keywords, and union is now or/c.

The mzlib/contract library re-exports many bindings from racket/contract:

</c	flat-rec-contract
<=/c	guilty-party
=/c	integer-in
>/c	list/c
>=/c	listof
and/c	make-none/c
any	make-proj-contract
any/c	natural-number/c
between/c	none/c
box-immutable/c	not/c
build-compound-type-name	one-of/c
coerce-contract	or/c
cons/c	parameter/c
contract	printable/c
contract-first-order-passes?	promise/c
contract-violation->string	provide/contract
contract?	raise-contract-error
define-contract-struct	real-in
false/c	recursive-contract
flat-contract	string/len
flat-contract-predicate	symbols
flat-contract?	syntax/c
flat-murec-contract	vector-immutable/c
flat-named-contract	vector-immutableof

It also provides the old version of the following contracts:

```
(define/contract id contract-expr init-value-expr)
```

Attaches the contract *contract-expr* to *init-value-expr* and binds that to *id*.

The define/contract form treats individual definitions as units of blame. The definition itself is responsible for positive (co-variant) positions of the contract and each reference to

id (including those in the initial value expression) must meet the negative positions of the contract.

Error messages with `define/contract` are not as clear as those provided by `provide/contract`, because `define/contract` cannot detect the name of the definition where the reference to the defined variable occurs. Instead, it uses the source location of the reference to the variable as the name of that definition.

```
(box/c c) → flat-contract?
  c : flat-contract?
```

Returns a flat contract that recognizes boxes. The content of the box must match *c*.

```
(vectorof c) → flat-contract?
  c : flat-contract?
```

Accepts a flat contract and returns a flat contract that checks for vectors whose elements match the original contract.

```
(vector/c c ...) → flat-contract?
  c : flat-contract?
```

Accepts any number of flat contracts and returns a flat contract that recognizes vectors. The number of elements in the vector must match the number of arguments supplied to `vector/c`, and each element of the vector must match the corresponding flat contract.

```
(struct/c struct-id flat-contract-expr ...)
```

Produces a flat contract that recognizes instances of the structure type named by *struct-id*, and whose field values match the flat contracts produced by the *flat-contract-expr*s.

```
(build-flat-contract name predicate) → flat-contract?
  name : symbol?
  predicate : (-> any/c any)
```

Builds a flat contract out of *predicate*, giving it the name *name*. Nowadays, just using *predicate* directly is preferred.

```
(-> contract-dom-expr ... any)
(-> contract-dom-expr ... contract-rng-expr)
```

This is a restricted form of `racket/contract`'s `->` contract that does not handle keyword arguments or multiple value results.

```
(->* (contract-dom-expr ...) ->*rng)
(->* (contract-dom-expr ...) contract-rest-expr ->*rng)

->*rng = (contract-rng-expr ...)
       | any
```

The `->*` form matches up to `racket/contract`'s `->` and `->*`, according to the following rules; each equation on the left refers to a `mzlib/contract` combinator; on the right are the `racket/contract` equivalents.

```
(->* (contract-dom-expr ...) any) =
(-> contract-dom-expr ... any)


(->* (contract-dom-expr ...) (contract-rng-expr ...)) =
(-> contract-dom-expr ... (values contract-rng-expr))


(->* (contract-expr ...) contract-rest-expr any) =
(->* (contract-expr ...) #:rest contract-rest-expr any)


(->* (contract-expr ...) contract-rest-expr (contract-rng-
expr ...)) =
(->* (contract-expr ...)
     #:rest contract-rest-expr
     (values contract-rng-expr ...))
```

```
(opt-> (contract-req-expr ...) (contact-opt-expr ...) any)
(opt-> (contract-req-expr ...) (contact-opt-expr ...) contract-rng-expr)
```

The `opt->` form is a simplified verison of `racket/contract`'s `->*` and appearances of `opt->` can be simply replaced with `->*`.

```
(opt->* (contract-req-expr ...) (contact-opt-expr ...) any)
(opt->* (contract-req-expr ...) (contact-opt-expr ...) (contract-rng-expr ...))
```

The `opt->*` form matches up to `racket/contract`'s `->*`, according to the following rules; each equation on the left refers to a `mzlib/contract` combinator; on the right are the `racket/contract` equivalents.

```
(opt->* (contract-req-expr ...) (contract-opt-expr ...) any) =
(->* (contract-req-expr ...) (contract-opt-expr ...) any)
```

```
(opt->* (contract-req-expr ...)
        (contract-opt-expr ...)
        (contract-rng-expr ...)) =
(->* (contract-req-expr ...)
     (contract-opt-expr ...)
     (values contract-rng-expr ...))
```

```
(->d contract-dom-expr ... contract-rng-fun-expr)
```

The `->d` contract constructor is just like `->`, except that the range position is expected to be a function that accepts the actual arguments passed to the function, and returns a contract for the range. For example, this is one contract for `sqrt`:

```
(->d real?
     (λ (in)
       (and/c real?
              (λ (out)
                (< (abs (- (sqr out) in))
                   0.01)))))
```

It says that the input must be a real number, and so must the result, and that the square of the result is within `0.01` of input.

```
(->d* (contract-dom-expr ...) contract-rng-fun-expr)
(->d* (contract-dom-expr ...) contract-rest-expr contract-rng-fun-expr)
```

The `->d*` contract constructor is a generalization of `->d` to support multiple values and rest arguments.

In the two sub-expression case, the first sequence of contracts are contracts on the domain of the function and the second subexpression is expected to evaluate to a function that accepts as many arguments as there are expressions in the first position. It should return multiple values: one contract for each result of the function.

In the three sub-expression case, the first and last subexpressions are just like the sub-expressions in the two sub-expression case; the middle sub-expression si expected to evaluate to a contract on the rest argument.

```
(->r ([dom-x contract-dom-expr] ...) rng)
(->r ([dom-x contract-dom-expr] ...) rest-x contract-rest-expr rng)

rng = any
    | (values contract-expr ...)
    | contract-expr
```

The ->r form is a simplified version of racket/contract's ->i, where each *contract-dom-expr* is parameterized over all of the *dom-x* variables (and does lax checking; see ->d for details).

```
(->pp ([dom-x contract-dom-expr] ...) pre-cond-expr any)
(->pp ([dom-x contract-dom-expr] ...)
      pre-cond-expr
      (values [rng-x contract-rng-expr] ...)
      post-cond-expr)
(->pp ([dom-x contract-dom-expr] ...)
      pre-cond-expr
      contract-rng-expr
      rng-x
      post-cond-expr)
```

The ->pp form, like ->r is a simplified version of racket/contract's ->i, where each *contract-dom-expr* is parameterized over all of the *dom-x* variables (and does lax checking; see racket/contract's ->d for details). Unlike ->r, it also has pre- and post-condition expressions; these expressions are also implicitly parameterized over all of the *dom-x* variables and the post-condition is also paramterized over *rng-x*, which is bound to the result of the function.

```
(->pp-rest ([dom-x contract-dom-expr] ...) rest-x rest-contract-
expr pre-cond-expr any)
(->pp-rest ([dom-x contract-dom-expr] ...)
           rest-x rest-contract-expr
           pre-cond-expr
           (values [rng-x contract-rng-expr] ...)
           post-cond-expr)
(->pp-rest ([dom-x contract-dom-expr] ...)
           rest-x rest-contract-expr
           pre-cond-expr
           contract-rng-expr
           rng-x
           post-cond-expr)
```

Like ->pp, but with an additional contract for the rest arguments of the function.

```
(case-> mzlib/contract-arrow-contract-expr ...)
```

Builds a contract analogous to case-lambda, where each case comes from one of the contract expression arguments (tried in order).

```
(object-contract [id mzlib/contract-arrow-contract-expr] ...)
```

Builds a contract for objects where each *id* is expected to be a method on the object living up to the corresponding contract

13 mzlib/control

(require mzlib/control) package: compatibility-lib

NOTE: This library is deprecated; use racket/control, instead.

Re-exports scheme/control.

14 mzlib/date

(require mzlib/date) package: compatibility-lib

NOTE: This library is deprecated; use racket/date, instead.

Re-exports scheme/date.

15 mzlib/deflate

(require mzlib/deflate) package: compatibility-lib

NOTE: This library is deprecated; use file/gzip, instead.

Re-exports file/gzip.

16 mzlib/defmacro

(require mzlib/defmacro) package: compatibility-lib

NOTE: This library is deprecated; use compatibility/defmacro, instead.

Re-exports compatibility/defmacro.

17 mzlib/etc

```
(require mzlib/etc)
```
package: compatibility-lib

The mzlib/etc library re-exports the following from scheme/base and other libraries:

- boolean=?
- true
- false
- build-list
- build-string
- build-vector
- compose
- local
- symbol=?
- nand
- nor

```
(begin-lifted expr ...+)
```

Lifts the exprs so that they are evaluated once at the "top level" of the current context, and the result of the last expr is used for every evaluation of the begin-lifted form.

When this form is used as a run-time expression within a module, the "top level" corresponds to the module's top level, so that each expr is evaluated once for each invocation of the module. When it is used as a run-time expression outside of a module, the "top level" corresponds to the true top level. When this form is used in a define-syntax, letrec-syntax, etc. binding, the "top level" corresponds to the beginning of the binding's right-hand side. Other forms may redefine "top level" (using local-expand/capture-lifts) for the expressions that they enclose.

```
(begin-with-definitions defn-or-expr ...)
```

The same as (block defn-or-expr ...).

```
(define-syntax-set (id ...) defn ...)
```

Similar to define-syntaxes, but instead of a single body expression, a sequence of definitions follows the sequence of defined identifiers. For each identifier, the defns should include a definition for id/proc. The value for id/proc is used as the (expansion-time) value for id.

The define-syntax-set form is useful for defining a set of syntax transformers that share helper functions, though begin-for-syntax now serves essentially the same purposes.

Examples:

```
(define-syntax-set (let-current-continuation
                    let-current-escape-continuation)
  (define (mk call-id)
    (lambda (stx)
      (syntax-case stx ()
        [(_ id body1 body ...)
         (with-syntax ([call call-id])
           #'(call (lambda (id) body1 body ...)))])))
  (define let-current-continuation/proc
    (mk (quote-syntax call/cc)))
  (define let-current-escape-continuation/proc
    (mk (quote-syntax call/ec))))
```

```
(evcase key-expr (value-expr body-expr ...) ...+)
(evcase key-expr (value-expr body-expr ...) ... [else body-expr ...])
```

The evcase form is similar to case, except that expressions are provided in each clause instead of a sequence of data. After *key-expr* is evaluated, each *value-expr* is evaluated until a value is found that is eqv? to the key value; when a matching value is found, the corresponding *body-expr*s are evaluated and the value(s) for the last is the result of the entire evcase expression.

The else literal is recognized either as unbound (like in the mzscheme language) or bound as else from scheme/base.

```
(identity v) → any/c
  v : any/c
```

Returns *v*.

```
(let+ clause body-expr ...+)

clause = (val target expr)
       | (rec target expr)
       | (vals (target ...) expr)
       | (recs (target expr) ...)
       | (_ expr ...)

target = id
       | (values id ...)
```

A binding construct that specifies scoping on a per-binding basis instead of a per-expression basis. It helps eliminate rightward-drift in programs. It looks similar to let, except each clause has an additional keyword tag before the binding variables.

Each *clause* has one of the following forms:

- `(val target expr)` : Binds `target` non-recursively to `expr`.
- `(rec target expr)` : Binds `target` recursively to `expr`.
- `(vals (target expr) ...)` : The `target`s are bound to the `expr`s. The environment of the `expr`s is the environment active before this clause.
- `(recs (target expr) ...)` : The `target`ss are bound to the `expr`s. The environment of the `expr`s includes all of the `target`ss.
- `(_ expr ...)` : Evaluates the `expr`s without binding any variables.

The clauses bind left-to-right. When a `target` is `(values id ...)`, multiple values returned by the corresponding expression are bound to the multiple variables.

Examples:

```
> (let+ ([val (values x y) (values 1 2)])
    (list x y))
'(1 2)
> (let ([x 1])
    (let+ ([val x 3]
           [val y x])
      y))
3
```

```
(loop-until start done? next f) → void?
  start : any/c
  done? : (any/c . -> . any)
  next : (any/c . -> . any/c)
  f : (any/c . -> . any)
```

Repeatedly invokes the `f` procedure until the `done?` procedure returns `#t`:

```
(define (loop-until start done? next f)
  (let loop ([i start])
    (unless (done? i)
      (f i)
      (loop (next i)))))
```

```
(namespace-defined? sym) → boolean?
  sym : symbol?
```

Returns `#t` if `namespace-variable-value` would return a value for `sym`, `#f` otherwise.

```
(nand expr ...)
```

Same as `(not (and expr ...))`.

```
(nor expr ...)
```

Same as `(not (or expr ...))`.

```
(opt-lambda formals body ...+)
```

Supports optional (but not keyword) arguments like `lambda` from `scheme/base`.

```
(recur id bindings body ...+)
```

Equivalent to `(let id bindings body ...+)`.

```
(rec id value-expr)
(rec (id arg-id ...) expr)
(rec (id arg-id ... . rest-id) expr)
```

Equivalent, respectively, to

```
(letrec ([id value-expr]) id)
(letrec ([id (lambda (arg-id ...) value-expr)]) id)
(letrec ([id (lambda (arg-id ... . rest-id) value-expr)]) id)
```

```
(this-expression-source-directory)
(this-expression-source-directory datum)
```

See `scheme/runtime-path` for a definition form that works better when creating executables.

Expands to an expression that evaluates to the directory of the file containing the source *datum*. If *datum* is not supplied, then the entire `(this-expression-source-directory)` expression is used as *datum*.

If *datum* has a source module, then the expansion attempts to determine the module's run-time location. This location is determined by preserving the lexical context of *datum* in a syntax object, extracting its source module path at run time, and then resolving the module path.

Otherwise, *datum*'s source file is determined through source location information associated with *datum*, if it is present. As a last resort, `current-load-relative-directory` is used if it is not `#f`, and `current-directory` is used if all else fails.

A directory path derived from source location is always stored in bytes in the expanded code, unless the file is within the result of `find-collects-dir`, in which case the expansion records the path relative to `(find-collects-dir)` and then reconstructs it using `(find-collects-dir)` at run time.

```
(this-expression-file-name)
(this-expression-file-name datum)
```

Similar to `this-expression-source-directory`, except that only source information associated with *datum* or `(this-expression-file-name)` is used to extract a filename. If no filename is available, the result is `#f`.

```
(hash-table (quote flag) ... (key-expr val-expr) ...)
```

Creates a new hash-table providing the quoted flags (if any) to `make-hash-table`, and then mapping each key to the corresponding values.

18 mzlib/file

```
(require mzlib/file)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/file, instead.

The mzlib/file library mostly re-exports from scheme/file:

```
find-relative-path
explode-path
normalize-path
filename-extension
file-name-from-path
path-only
delete-directory/files
copy-directory/files
make-directory*
make-temporary-file
get-preference
put-preferences
fold-files
find-files
pathlist-closure
```

```
(call-with-input-file* file proc [mode]) → any
  file : path-string?
  proc : (input-port? -> any)
  mode : (one-of/c 'text 'binary) = 'binary
(call-with-output-file*  file
                         proc
                        [mode
                         exists]) → any
  file : path-string?
  proc : (output-port? -> any)
  mode : (one-of/c 'text 'binary) = 'binary
  exists : (one-of/c 'error 'append 'update
                     'replace 'truncate 'truncate/replace)
         = 'error
```

Like call-with-input-fileand call-with-output-file, except that the opened port is closed if control escapes from the body of *proc*.

```
(build-relative-path base sub ...) → (and/c path? relative-path?)
  base : (or/c path-string?
               (one-of/c 'up 'same))
  sub : (or/c (and/c path-string?
                     relative-path?)
              (one-of/c 'up 'same))
(build-absolute-path base sub ...) → (and/c path? absolute-path?)
  base : (or/c (and/c path-string?
                      (not/c relative-path?))
               (one-of/c 'up 'same))
  sub : (or/c (and/c path-string?
                     (not/c complete-path?))
              (one-of/c 'up 'same))
```

Like `build-path`, but with extra constraints to ensure a relative or absolute result.

19 mzlib/for

```
(require mzlib/for)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/base, instead.

The mzlib/for library re-exports from scheme/base:

```
for/fold for*/fold
for for*
for/list for*/list
for/lists for*/lists
for/and for*/and
for/or for*/or
for/first for*/first
for/last for*/last

for/fold/derived for*/fold/derived

in-range
in-naturals
in-list
in-vector
in-string
in-bytes
in-input-port-bytes
in-input-port-chars
in-hash-table
in-hash-table-keys
in-hash-table-values
in-hash-table-pairs

in-parallel
stop-before
stop-after
in-indexed

sequence?
sequence-generate

define-sequence-syntax
make-do-sequence
:do-in
```

20 mzlib/foreign

(require mzlib/foreign) package: compatibility-lib

NOTE: This library is deprecated; use ffi/unsafe, instead.

Re-exports scheme/foreign.

21 mzlib/include

```
(require mzlib/include)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/include, instead.

Similar to scheme/include, but with a different syntax for paths.

```
(include path-spec)

path-spec = string
          | (build-path elem ...+)
          | (lib file-string collection-string ...)

     elem = string
          | up
          | same
```

Inlines the syntax in the designated file in place of the include expression. The *path-spec* can be any of the following:

- A literal string that specifies a path to include, parsed according to the platform's conventions (which means that it is not portable).
- A path construction of the form (build-path *elem* ...+), where build-path is module-identifier=? either to the build-path export from mzscheme or to the top-level build-path, and where each *elem* is a path string, up (unquoted), or same (unquoted). The *elem*s are combined in the same way as for the build-path function to obtain the path to include.
- A path construction of the form (lib *file-string collection-string* ...), where lib is free or refers to a top-level lib variable. The *collection-string*s are passed to collection-path to obtain a directory; if no collection-stringss are supplied, "mzlib" is used. The *file-string* is then appended to the directory using build-path to obtain the path to include.

If *path-spec* specifies a relative path to include, the path is resolved relative to the source for the include expression, if that source is a complete path string. If the source is not a complete path string, then *path-spec* is resolved relative to the current load relative directory if one is available, or to the current directory otherwise.

The included syntax is given the lexical context of the include expression.

```
(include-at/relative-to context source path-spec)
(include-at/relative-to/reader context source path-spec reader-expr)
(include/reader path-spec reader-expr)
```

Variants of `include` analogous to the variants of `scheme/include`.

22 mzlib/inflate

(require mzlib/inflate) package: compatibility-lib

NOTE: This library is deprecated; use file/gunzip, instead.

Re-exports file/gunzip.

23 mzlib/integer-set

```
(require mzlib/integer-set)
```
package: compatibility-lib

NOTE: This library is deprecated; use data/integer-set, instead.

The mzlib/integer-set library re-exports bindings from data/integer-set except that it renames symmetric-difference to xor, subtract to difference, and count to card.

24 mzlib/kw

```
(require mzlib/kw)
```
package: compatibility-lib

NOTE: This library is deprecated; use `racket/base`, instead. The Racket base language supports keyword arguments. Using the built-in keyword arguments in Racket is highly recommended.

The `lambda` and procedure-application forms of `scheme/base` support keyword arguments, and it is *not* compatible with the `mzlib/kw` library.

```
(lambda/kw kw-formals body ...+)
(define/kw (head args) body ...+)

    kw-formals = id
               | (id ... [#:optional optional-spec ...]
                         [#:key key-spec ...]
                         [rest/mode-spec ...])
               | (id ... . id)

 optional-spec = id
               | (id default-expr)

      key-spec = id
               | (id default-expr)
               | (id keyword default-expr)

rest/mode-spec = #:rest id
               | #:other-keys id
               | #:other-keys+body id
               | #:all-keys id
               | #:body kw-formals
               | #:allow-other-keys
               | #:forbid-other-keys
               | #:allow-duplicate-keys
               | #:forbid-duplicate-keys
               | #:allow-body
               | #:forbid-body
               | #:allow-anything
               | #:forbid-anything

          head = id
               | (head . kw-formals)
```

Like `lambda`, but with optional and keyword-based argument processing. This form is similar to an extended version of Common Lisp procedure arguments (but note the differences below). When used with plain variable names, `lambda/kw` expands to a plain `lambda`, so

`lambda/kw` is suitable for a language module that will use it to replace `lambda`. Also, when used with only optionals, the resulting procedure is similar to `opt-lambda` (but a bit faster).

In addition to `lambda/kw`, `define/kw` is similar to `define`, except that the `formals` are as in `lambda/kw`. Like `define`, this form can be used with nested parenthesis for curried functions (the MIT-style generalization of `define`).

The syntax of `lambda/kw` is the same as `lambda`, except for the list of formal argument specifications. These specifications can hold (zero or more) plain argument names, then an optionals (and defaults) section that begins after an `#:optional` marker, then a keyword section that is marked by `#:keyword`, and finally a section holding rest and "rest"-like arguments which are described below, together with argument processing flag directives. Each section is optional, but the order of the sections must be as listed. Of course, all binding *id*s must be unique.

The following sections describe each part of the *kw-formals*.

24.1 Required Arguments

Required arguments correspond to `id`s that appear before any keyword marker in the argument list. They determine the minimum arity of the resulting procedure.

24.2 Optional Arguments

The optional-arguments section follows an `#:optional` marker in the *kw-formals*. Each optional argument can take the form of a parenthesized variable and a default expression; the latter is used if a value is not given at the call site. The default expression can be omitted (along with the parentheses), in which case `#f` is the default.

The default expression's environment includes all previous arguments, both required and optional names. With k optionals after n required arguments, and with no keyword arguments or rest-like arguments, the resulting procedure accept between n and $n+k$ arguments, inclusive.

The treatment of optionals is efficient, with an important caveat: default expressions appear multiple times in the resulting `case-lambda`. For example, the default expression for the last optional argument appears k-1 times (but no expression is ever evaluated more than once in a procedure call). This expansion risks exponential blow-up is if `lambda/kw` is used in a default expression of a `lambda/kw`, etc. The bottom line, however, is that `lambda/kw` is a sensible choice, due to its enhanced efficiency, even when you need only optional arguments.

Using both optional and keyword arguments is possible, but note that the resulting behavior differs from traditional keyword facilities (including the one in Common Lisp). See the

following section for details.

24.3 Keyword Arguments

A keyword argument section is marked by a `#:key`. If it is used with optional arguments, then the keyword specifications must follow the optional arguments (which mirrors the use in call sites; where optionals are given before keywords).

When a procedure accepts both optional and keyword arguments, the argument-handling convention is slightly different than in traditional keyword-argument facilities: a keyword after required arguments marks the beginning of keyword arguments, no matter how many optional arguments have been provided before the keyword. This convention restricts the procedure's non-keyword optional arguments to non-keyword values, but it also avoids confusion when mixing optional arguments and keywords. For example, when a procedure that takes two optional arguments and a keyword argument `#:x` is called with `#:x 1`, then the optional arguments get their default values and the keyword argument is bound to `1`. (The traditional behavior would bind `#:x` and `1` to the two optional arguments.) When the same procedure is called with `1 #:x 2`, the first optional argument is bound to `1`, the second optional argument is bound to its default, and the keyword argument is bound to `2`. (The traditional behavior would report an error, because `2` is provided where `#:x` is expected.)

Like optional arguments, each keyword argument is specified as a parenthesized variable name and a default expression. The default expression can be omitted (with the parentheses), in which case `#f` is the default value. The keyword used at a call site for the corresponding variable has the same name as the variable; a third form of keyword arguments has three parts—a variable name, a keyword, and a default expression—to allow the name of the locally bound variable to differ from the keyword used at call sites.

When calling a procedure with keyword arguments, the required argument (and all optional arguments, if specified) must be followed by an even number of arguments, where the first argument is a keyword that determines which variable should get the following value, etc. If the same keyword appears multiple times (and if multiple instances of the keyword are allowed; see §24.6 "Mode Keywords"), the value after the first occurrence is used for the variable:

Example:

```
> ((lambda/kw (#:key x [y 2] [z #:zz 3] #:allow-duplicate-keys)
     (list x y z))
   #:x 'x #:zz 'z #:x "foo")
'(x 2 z)
```

Default expressions are evaluated only for keyword arguments that do not receive a value for a particular call. Like optional arguments, each default expression is evaluated in an

environment that includes all previous bindings (required, optional, and keywords that were specified on its left).

See §24.6 “Mode Keywords” for information on when duplicate or unknown keywords are allowed at a call site.

24.4 Rest and Rest-like Arguments

The last *kw-formals* section—after the required, optional, and keyword arguments—may contain specifications for rest-like arguments and/or mode keywords. Up to five rest-like arguments can be declared, each with an *id* to bind:

- `#:rest` — The variable is bound to the list of “rest” arguments, which is the list of all values after the required and the optional values. This list includes all keyword-value pairs, exactly as they are specified at the call site.

  Scheme’s usual dot-notation is accepted in *kw-formals* only if no other meta-keywords are specified, since it is not clear whether it should specify the same binding as a `#:rest` or as a `#:body`. The dot notation is allowed without meta-keywords to make the `lambda/kw` syntax compatible with `lambda`.

- `#:body` — The variable is bound to all arguments after keyword–value pairs. (This is different from Common Lisp’s `&body`, which is a synonym for `&rest`.) More generally, a `#:body` specification can be followed by another *kw-formals*, not just a single *id*; see §24.5 “Body Argument” for more information.

- `#:all-keys` — the variable is bound to the list of all keyword-values from the call site, which is always a proper prefix of a `#:rest` argument. (If no `#:body` arguments are declared, then `#:all-keys` binds the same as `#:rest`.) See also `keyword-get`.

- `#:other-keys` — The variable is bound like an `#:all-keys` variable, except that all keywords specified in the `kw-formals` are removed from the list. When a keyword is used multiple times at a call cite (and this is allowed), only the first instances is removed for the `#:other-keys` binding.

- `#:other-keys+body` — the variable is bound like a `#:rest` variable, except that all keywords specified in the *kw-formals* are removed from the list. When a keyword is used multiple times at a call site (and this is allowed), only the first instance us removed for the `#:other-keys+body` binding. (When no `#:body` variables are specified, then `#:other-keys+body` is the same as `#:other-keys`.)

In the following example, all rest-like arguments are used and have different bindings:

Example:

```
> ((lambda/kw (#:key x y
                #:rest r
                #:other-keys+body rk
                #:all-keys ak
                #:other-keys ok
                #:body b)
    (list r rk b ak ok))
  #:z 1 #:x 2 2 3 4)
'((#:z 1 #:x 2 2 3 4) (#:z 1 2 3 4) (2 3 4) (#:z 1 #:x 2) (#:z 1))
```

Note that the following invariants always hold:

- *rest* = (append *all-keys body*)
- *other-keys+body* = (append *other-keys body*)

To write a procedure that uses a few keyword argument values, and that also calls another procedure with the same list of arguments (including all keywords), use `#:other-keys` (or `#:other-keys+body`). The Common Lisp approach is to specify `:allow-other-keys`, so that the second procedure call will not cause an error due to unknown keywords, but the `:allow-other-keys` approach risks confusing the two layers of keywords.

24.5 Body Argument

The most notable divergence from Common Lisp in `lambda/kw` is the `#:body` argument, and the fact that it is possible at a call site to pass plain values after the keyword-value pairs. The `#:body` binding is useful for procedure calls that use keyword-value pairs as sort of an attribute list before the actual arguments to the procedure. For example, consider a procedure that accepts any number of numeric arguments and will apply a procedure to them, but the procedure can be specified as an optional keyword argument. It is easily implemented with a `#:body` argument:

Examples:

```
> (define/kw (mathop #:key [op +] #:body b)
    (apply op b))
> (mathop 1 2 3)
6
> (mathop #:op max 1 2 3)
3
```

(Note that the first body value cannot itself be a keyword.)

A `#:body` declaration works as an arbitrary `kw-formals`, not just a single variable like `b` in the above example. For example, to make the above `mathop` work only on three arguments that follow the keyword, use `(x y z)` instead of `b`:

Example:

```
> (define/kw (mathop #:key [op +] #:body (x y z))
    (op x y z))
```

In general, `#:body` handling is compiled to a sub procedure using `lambda/kw`, so that a procedure can use more then one level of keyword arguments. For example:

Examples:

```
> (define/kw (mathop #:key [op +]
                     #:body (x y z #:key [convert values]))
    (op (convert x) (convert y) (convert z)))
> (mathop #:op * 2 4 6 #:convert exact->inexact)
48.0
```

Obviously, nested keyword arguments works only when non-keyword arguments separate the sets.

Run-time errors during such calls report a mismatch for a procedure with a name that is based on the original name plus a `~body` suffix:

Example:

```
> (mathop #:op * 2 4)
mathop~body: arity mismatch;
 the expected number of arguments does not match the given
number
  expected: at least 3
  given: 2
```

24.6 Mode Keywords

Finally, the argument list of a `lambda/kw` can contain keywords that serve as mode flags to control error reporting.

- `#:allow-other-keys` — The keyword-value sequence at the call site *can* include keywords that are not listed in the keyword part of the `lambda/kw` form.
- `#:forbid-other-keys` — The keyword-value sequence at the call site *cannot* include keywords that are not listed in the keyword part of the `lambda/kw` form, otherwise the `exn:fail:contract` exception is raised.

- `#:allow-duplicate-keys` — The keyword-value list at the call site *can* include duplicate values associated with same keyword, the first one is used.
- `#:forbid-duplicate-keys` — The keyword-value list at the call site *cannot* include duplicate values for keywords, otherwise the `exn:fail:contract` exception is raised. This restriction applies only to keywords that are listed in the keyword part of the `lambda/kw` form — if other keys are allowed, this restriction does not apply to them.
- `#:allow-body` — Body arguments *can* be specified at the call site after all keyword-value pairs.
- `#:forbid-body` — Body arguments *cannot* be specified at the call site after all keyword-value pairs.
- `#:allow-anything` — Allows all of the above, and treat a single keyword at the end of an argument list as a `#:body`, a situation that is usually an error. When this is used and no rest-like arguments are used except `#:rest`, an extra loop is saved and calling the procedures is faster (around 20%).
- `#:forbid-anything` — Forbids all of the above, ensuring that calls are as restricted as possible.

These above mode markers are rarely needed, because the default modes are determined by the declared rest-like arguments:

- The default is to allow other keys if a `#:rest`, `#:other-keys+body`, `#:all-keys`, or `#:other-keys` variable is declared (and an `#:other-keys` declaration requires allowing other keys).
- The default is to allow duplicate keys if a `#:rest` or `#:all-keys` variable is declared.
- The default is to allow body arguments if a `#:rest`, `#:body`, or `#:other-keys+body` variable is declared (and a `#:body` argument requires allowing them).

Here's an alternate specification, which maps rest-like arguments to the behavior that they imply:

- `#:rest`: Everything is allowed (a body, other keys, and duplicate keys);
- `#:other-keys+body`: Other keys and body are allowed, but duplicates are not;
- `#:all-keys`: Other keys and duplicate keys are allowed, but a body is not;
- `#:other-keys`: Other keys must be allowed (on by default, cannot use with `#:forbid-other-keys`), and duplicate keys and body are not allowed;

- `#:body`: Body must be allowed (on by default, cannot use with `#:forbid-body`) and other keys and duplicate keys and body are not allowed;
- Except for the previous two "must"s, defaults can be overridden by an explicit `#:allow-...` or a `#:forbid-...` mode.

24.7 Property Lists

```
(keyword-get args kw not-found) → any
  args : (listof (cons/c keyword? any/c))
  kw : keyword?
  not-found : (-> any)
```

Searches a list of keyword arguments (a "property list" or "plist" in Lisp jargon) for the given keyword, and returns the associated value. It is the facility that is used by `lambda/kw` to search for keyword values.

The *args* list is scanned from left to right, if the keyword is found, then the next value is returned. If the *kw* was not found, then the *not-found* thunk is used to produce a value by applying it. If the *kw* was not found, and *not-found* thunk is not given, `#f` is returned. (No exception is raised if the *args* list is imbalanced, and the search stops at a non-keyword value.)

25 mzlib/list

(require mzlib/list) package: compatibility-lib

NOTE: This library is deprecated; use racket/list, instead.

The mzlib/list library re-exports several functions from scheme/base and scheme/list:

cons?
empty?
empty
foldl
foldr
remv
remq
remove
remv*
remq*
remove*
findf
memf
assf
filter
sort

```
(first v) → any/c
  v : pair?
(second v) → any/c
  v : (and/c pair? ....)
(third v) → any/c
  v : (and/c pair? ....)
(fourth v) → any/c
  v : (and/c pair? ....)
(fifth v) → any/c
  v : (and/c pair? ....)
(sixth v) → any/c
  v : (and/c pair? ....)
(seventh v) → any/c
  v : (and/c pair? ....)
(eighth v) → any/c
  v : (and/c pair? ....)
```

Accesses the first, second, etc. elment of "list" v. The argument need not actually be a list; it is inspected only as far as necessary to obtain an element (unlike the same-named functions from scheme/list, which do require the argument to be a list).

```
(rest v) → any/c
  v : pair?
```

The same as `cdr`.

```
(last-pair v) → pair?
  v : pair?
```

Returns the last pair in `v`, raising an error if `v` is not a pair (but `v` does not have to be a proper list).

```
(merge-sorted-lists lst1 lst2 less-than?) → list?
  lst1 : list?
  lst2 : lst?
  less-than? : (any/c any/c . -> . any/c)
```

Merges the two sorted input lists, creating a new sorted list. The merged result is stable: equal items in both lists stay in the same order, and these in *lst1* precede *lst2*.

```
(mergesort lst less-than?) → list?
  lst : list?
  less-than? : (any/c any/c . -> . any/c)
```

The same as `sort`.

```
(quicksort lst less-than?) → list?
  lst : list?
  less-than? : (any/c any/c . -> . any/c)
```

The same as `sort`.

26 mzlib/match

```
(require mzlib/match)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/match, instead.

The mzlib/match library provides a match form similar to that of racket/match, but with an different (older and less extensible) syntax of patterns.

```
(match val-expr clause ...)

clause = [pat expr ...+]
       | [pat (=> id) expr ...+]
```

See match from racket/match for a description of matching. The grammar of *pat* for this match is as follows:

pat	::=	*id*	match anything, bind identifier
	|	_	match anything
	|	*literal*	match literal
	|	'*datum*	match equal? datum
	|	(*lvp* ...)	match sequence of *lvp*s
	|	(*lvp* ... . *pat*)	match *lvp*s consed onto a *pat*
	|	#(*lvp* ...)	match vector of *pat*s
	|	#&*pat*	match boxed *pat*
	|	($ *struct-id pat* ...)	match *struct-id* instance
	|	(and *pat* ...)	match when all *pat*s match
	|	(or *pat* ...)	match when any *pat* match
	|	(not *pat* ...)	match when no *pat* match
	|	(= *expr pat*)	match (*expr* value) to *pat*
	|	(? *pred-expr pat* ...)	match if (*expr* value) and *pat*s
	|	`*qp*	match quasipattern
literal	::=	#t	match true
	|	#f	match false
	|	*string*	match equal? string
	|	*number*	match equal? number
	|	*character*	match equal? character
	|	*bytes*	match equal? byte string
	|	keyword	match equal? keyword
	|	regexp	match equal? regexp literal
	|	pregexp	match equal? pregexp literal
lvp	::=	*pat*	greedily match *pat* instances
	|	*pat*	match *pat*
ooo	::=	...	zero or more; ... is literal
	|	___	zero or more

	| *..k*	*k* or more
	| *__k*	*k* or more
qp	::= *literal*	match literal
	| *id*	match `equal?` symbol
	| (*qp* ...)	match sequences of *qp*s
	| (*qp* ... . *qp*)	match sequence of *qp*s consed onto a *qp*
	| (*qp* ... *qp* *ooo*)	match *qp*s consed onto a repeated *qp*
	| #(*qp* ...)	match vector of *qp*s
	| #&*qp*	match boxed *qp*
	| ,*pat*	match *pat*
	| ,@*pat*	match *pat*, spliced

```
(define/match (head args) match*-clause ...)
(match-lambda clause ...)
(match-lambda* clause ...)
(match-let ([pat expr] ...) body ...+)
(match-let* ([pat expr] ...) body ...+)
(match-letrec ([pat expr] ...) body ...+)
(match-define pat expr)
```

Analogous to the combined forms from `racket/match`.

```
(define-match-expander id proc-expr)
(define-match-expander id proc-expr proc-expr)
(define-match-expander id proc-expr proc-expr proc-expr)
(match-equality-test) → (any/c any/c . -> . any)
(match-equality-test comp-proc) → void?
  comp-proc : (any/c any/c . -> . any)
```

Analogous to the form and parameter from `racket/match`. The `define-match-expander` form, however, supports an extra *proc-expr* as the middle one: an expander for use with `match` from `mzlib/match`.

27 mzlib/math

```
(require mzlib/math)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/math, instead.

Re-exports scheme/math, and also exports e.

```
e : real?
```

An approximation to Euler's constant: 2.718281828459045.

28 mzlib/md5

(require mzlib/md5) package: compatibility-lib

NOTE: This library is deprecated; use file/md5, instead.

Re-exports file/md5.

29 mzlib/os

```
(require mzlib/os)
```
package: compatibility-lib

```
(gethostname) → string?
```

Returns a string for the current machine's hostname (including its domain).

```
(getpid) → exact-integer?
```

Returns an integer identifying the current process within the operating system.

```
(truncate-file file [n-bytes]) → void?
  file : path-string?
  n-bytes : exact-nonnegative-integer? = 0
```

Truncates or extends the given *file* so that it is *n-bytes* long. If the file does not exist, or if the process does not have sufficient privilege to truncate the file, the exn:fail exception is raised.

The truncate-file function is implemented in terms of racket/base's file-truncate.

30 mzlib/pconvert

See mzlib/pconvert.

31 mzlib/pconvert-prop

See mzlib/pconvert-prop.

32 mzlib/plt-match

```
(require mzlib/plt-match)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/match, instead.

The mzlib/plt-match library mostly re-provides scheme/match.

```
(define-match-expander id proc-expr)
(define-match-expander id proc-expr proc-expr)
(define-match-expander id proc-expr proc-expr proc-expr)
```

The same as the form from mzlib/match.

33 mzlib/port

```
(require mzlib/port)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/port, instead.

The mzlib/port library mostly re-provides racket/port.

```
(strip-shell-command-start in) → void?
  in : input-port?
```

Reads and discards a leading #! in *in* (plus continuing lines if the line ends with a backslash). Since #! followed by a forward slash or space is a comment, this procedure is not needed before reading Scheme expressions.

34 mzlib/pregexp

```
(require mzlib/pregexp)
```
package: compatibility-lib

NOTE: This library is deprecated; use `racket/base`, instead.

The `mzlib/pregexp` library provides wrappers around `regexp-match`, etc. that coerce string and byte-string arguments to `pregexp` matchers instead of `regexp` matchers.

The library also re-exports: `pregexp`, and it re-exports `regexp-quote` as `pregexp-quote`.

```
(pregexp-match  pattern
                input
               [start-pos
                end-pos
                output-port])
 → (or/c (listof (or/c (cons (or/c string? bytes?)
                             (or/c string? bytes?))
                       false/c))
         false/c)
  pattern : (or/c string? bytes? regexp? byte-regexp?)
  input : (or/c string? bytes? input-port?)
  start-pos : exact-nonnegative-integer? = 0
  end-pos : (or/c exact-nonnegative-integer? false/c) = #f
  output-port : (or/c output-port? false/c) = #f
(pregexp-match-positions  pattern
                          input
                         [start-pos
                          end-pos
                          output-port])
 → (or/c (listof (or/c (cons exact-nonnegative-integer?
                             exact-nonnegative-integer?)
                       false/c))
         false/c)
  pattern : (or/c string? bytes? regexp? byte-regexp?)
  input : (or/c string? bytes? input-port?)
  start-pos : exact-nonnegative-integer? = 0
  end-pos : (or/c exact-nonnegative-integer? false/c) = #f
  output-port : (or/c output-port? false/c) = #f
```

```
(pregexp-split  pattern
                input
               [start-pos
                end-pos]) → (listof (or/c string? bytes?))
  pattern : (or/c string? bytes? regexp? byte-regexp?)
  input : (or/c string? bytes? input-port?)
  start-pos : exact-nonnegative-integer? = 0
  end-pos : (or/c exact-nonnegative-integer? false/c) = #f
(pregexp-replace pattern input insert) → (or/c string? bytes?)
  pattern : (or/c string? bytes? regexp? byte-regexp?)
  input : (or/c string? bytes?)
  insert : (or/c string? bytes?
                 (string? . -> . string?)
                 (bytes? . -> . bytes?))
(pregexp-replace* pattern input insert) → (or/c string? bytes?)
  pattern : (or/c string? bytes? regexp? byte-regexp?)
  input : (or/c string? bytes?)
  insert : (or/c string? bytes?
                 (string? . -> . string?)
                 (bytes? . -> . bytes?))
```

Like regexp-match, etc., but a string *pattern* argument is compiled via pregexp, and a byte string *pattern* argument is compiled via byte-pregexp.

35 mzlib/pretty

```
(require mzlib/pretty)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/pretty, instead.

Re-exports scheme/pretty.

36 mzlib/process

(require mzlib/process) package: compatibility-lib

NOTE: This library is deprecated; use racket/system, instead.

Re-exports scheme/system.

37 mzlib/restart

```
(require mzlib/restart)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/sandbox, instead. The racket/sandbox library provides a more general way to simulate running a new Racket process.

```
(restart-mzscheme init-argv
                  adjust-flag-table
                  argv
                  init-namespace)   → boolean?
  init-argv : (vectorof string?)
  adjust-flag-table : (any/c . -> . any/c)
  argv : (vectorof string?)
  init-namespace : (-> any)
```

Simulates starting Racket with the vector of command-line strings *argv*. The *init-argv*, *adjust-flag-table*, and *init-namespace* arguments are used to modify the default settings for command-line flags, adjust the parsing of command-line flags, and customize the initial namespace, respectively.

The vector of strings *init-argv* is read first with the standard Racket command-line parsing. Flags that load files or evaluate expressions (e.g., -f and -e) are ignored, but flags that set Racket's modes (e.g., -c or -j) effectively set the default mode before *argv* is parsed.

Before *argv* is parsed, the procedure *adjust-flag-table* is called with a command-line flag table as accepted by parse-command-line. The return value must also be a table of command-line flags, and this table is used to parse *argv*. The intent is to allow *adjust-flag-table* to add or remove flags from the standard set.

After *argv* is parsed, a new thread and a namespace are created for the "restarted" Racket. (The new namespace is installed as the current namespace in the new thread.) In the new thread, restarting performs the following actions:

- The *init-namespace* procedure is called with no arguments. The return value is ignored.
- Expressions and files specified by *argv* are evaluated and loaded. If an error occurs, the remaining expressions and files are ignored, and the return value for restart-mzscheme is set to #f.
- The read-eval-print-loop procedure is called, unless a flag in *init-argv* or *argv* disables it. When read-eval-print-loop returns, the return value for restart-mzscheme is set to #t.

Before evaluating command-line arguments, an exit handler is installed that immediately returns from `restart-mzscheme` with the value supplied to the handler. This exit handler remains in effect when `read-eval-print-loop` is called (unless a command-line argument changes it). If `restart-mzscheme` returns normally, the return value is determined as described above.

Note that an error in a command-line expression followed by `read-eval-print-loop` produces a `#t` result. This is consistent with Racket's stand-alone behavior.

38 mzlib/runtime-path

(require mzlib/runtime-path) package: compatibility-lib

NOTE: This library is deprecated; use racket/runtime-path, instead.

Re-exports scheme/runtime-path.

39 mzlib/sandbox

```
(require mzlib/sandbox)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/sandbox, instead.

The mzlib/sandbox library mostly re-exports racket/sandbox, but it provides a slightly different make-evaluator function.

The library re-exports the following bindings:

sandbox-init-hook
sandbox-reader
sandbox-input
sandbox-output
sandbox-error-output
sandbox-propagate-breaks
sandbox-coverage-enabled
sandbox-namespace-specs
sandbox-override-collection-paths
sandbox-security-guard
sandbox-path-permissions
sandbox-network-guard
sandbox-make-inspector
sandbox-eval-limits
kill-evaluator
break-evaluator
set-eval-limits
put-input
get-output
get-error-output
get-uncovered-expressions
call-with-limits
with-limits
exn:fail:resource?
exn:fail:resource-resource

```
(make-evaluator language
                requires
                input-program ...) → (any/c . -> . any)
  language : (or/c module-path?
                   (one-of/c 'r5rs 'beginner 'beginner-abbr
                             'intermediate 'intermediate-lambda 'advanced)
                   (list/c (one-of/c 'special) symbol?)
                   (list/c (one-of/c 'special) symbol?)
                   (cons/c (one-of/c 'begin) list?))
```

```
  requires : (or/c (cons/c 'begin list?)
                   (listof (or/c module-path? path?)))
  input-program : any/c
(make-evaluator module-decl) → (any/c . -> . any)
  module-decl : (or/c syntax? pair?)
```

Like `make-evaluator` or `make-module-evaluator`, but with several differences:

- The *language* argument can be one of a fixed set of symbols: `'r5rs`, etc. They are converted by adding a `(list 'special ....)` wrapper.
- If *requires* starts with `'begin`, then each element in the remainder of the list is effectively evaluated as a prefix to the program. Otherwise, it corresponds to the `#:requires` argument of `make-evaluator`.
- For each of *language* and *requires* that starts with `'begin`, the expressions are inspected to find top-level `require` forms (using symbolic equality to detect `require`), and the required modules are added to the `#:allow` list for `make-evaluator`.

40 mzlib/sendevent

```
(require mzlib/sendevent)
```
package: compatibility-lib

The mzlib/sendevent library provides a send-event function that works only on Mac OS, and only when running in GRacket (though the library can be loaded in Racket).

```
(send-event  receiver-bytes
             event-class-bytes
             event-id-bytes
            [direct-arg-v
             argument-list])    → any/c
  receiver-bytes : (lambda (s) (and (bytes? s)
                                    (= 4 (bytes-length s))))
  event-class-bytes : (lambda (s) (and (bytes? s)
                                       (= 4 (bytes-length s))))
  event-id-bytes : (lambda (s) (and (bytes? s)
                                    (= 4 (bytes-length s))))
  direct-arg-v : any/c = (void)
  argument-list : list? = null
```

Calls send-event scheme/gui/base, if available, otherwise raises exn:fail:unsupported.

41 mzlib/serialize

```
(require mzlib/serialize)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/serialize, instead.

The mzlib/serialize library provides the same bindings as racket/serialize, except that define-serializable-struct and define-serializable-struct/versions are based on the syntax of define-struct from mzscheme.

```
(define-serializable-struct id-maybe-super (field-id ...) maybe-
inspector-expr)
(define-serializable-struct/versions id-maybe-super vers-num (field-id ...)
                                     (other-version-clause ...)
                                     maybe-inspector-expr)

      id-maybe-super = id
                     | (id super-id)

maybe-inspector-expr =
                     | inspector-expr

other-version-clause = (other-vers make-proc-expr
                                   cycle-make-proc-expr)
```

Like define-serializable-struct and define-serializable-struct/versions, but with the syntax of closer to define-struct of mzscheme.

42 mzlib/shared

(require mzlib/shared) package: compatibility-lib

NOTE: This library is deprecated; use racket/shared, instead.

Re-exports scheme/shared.

43 mzlib/string

```
(require mzlib/string)
```
package: compatibility-lib

> **NOTE:** This library is deprecated; use racket/base, instead. Also see racket/string

The mzlib/string library re-exports several functions from scheme/base:

```
real->decimal-string
regexp-quote
regexp-replace-quote
regexp-match*
regexp-match-positions*
regexp-match-peek-positions*
regexp-split
regexp-match-exact?
```

It also re-exports regexp-try-match as regexp-match/fail-without-reading.

```
(glob->regexp [str
               hide-dots?
               case-sensitive?
               simple?])        → (or/c regexp? byte-regexp?)
  str : (or/c string bytes?) = ?
  hide-dots? : any/c = #t
  case-sensitive? : any/c
                  = (eq? (system-path-convention-type)'unix)
  simple? : any/c = #f
```

Produces a regexp for a an input "glob pattern" *str*. A glob pattern is one that matches * with any string, ? with a single character, and character ranges are the same as in regexps (unless *simple?* is true). In addition, the resulting regexp does not match strings that begin with ., unless *str* begins with . or *hide-dots?* is #f. The resulting regexp can be used with string file names to check the glob pattern. If the glob pattern is provided as a byte string, the result is a byte regexp.

The *case-sensitive?* argument determines whether the resulting regexp is case-sensitive.

If *simple?* is true, then ranges with [...] in *str* are treated as literal character sequences.

```
(string-lowercase! str) → void?
  str : (and/c string? (not/c immutable?))
```

Destructively changes *str* to contain only lowercase characters.

```
(string-uppercase! str) → void?
  str : (and/c string? (not/c immutable?))
```

Destructively changes *str* to contain only uppercase characters.

```
(eval-string str [err-handler]) → list?
  str : (or/c string? bytes?)
  err-handler : (or/c false/c                = #f
                      (any/c . -> . any/c)
                      (-> any/c))
```

Reads and evaluates S-expressions from *str*, returning results for all of the expressions in the string. If any expression produces multiple results, the results are spliced into the resulting list. If *str* contains only whitespace and comments, an empty list is returned, and if *str* contains multiple expressions, the result will be contain multiple values from all subexpressions.

The *err-handler* argument can be:

- `#f` (the default) which means that errors are not caught;
- a one-argument procedure, which will be used with an exception (when an error occurs) and its result will be returned
- a thunk, which will be used to produce a result.

```
(expr->string expr) → string?
  expr : any/c
```

Prints *expr* into a string and returns the string.

```
(read-from-string str [err-handler]) → any/c
  str : (or/c string? bytes?)
  err-handler : (or/c false/c                = #f
                      (any/c . -> . any/c)
                      (-> any/c))
```

Reads the first S-expression from *str* and returns it. The *err-handler* is as in `eval-string`.

```
(read-from-string-all str [err-handler]) → list?
  str : (or/c string? bytes?)
  err-handler : (or/c false/c                = #f
                      (any/c . -> . any/c)
                      (-> any/c))
```

Reads all S-expressions from the string (or byte string) *str* and returns them in a list. The *err-handler* is as in eval-string.

44 mzlib/struct

```
(require mzlib/struct)
```
package: compatibility-lib

```
(copy-struct struct-id struct-expr
             (accessor-id field-expr) ...)
```

"Functional update" for structure instances. The result of evaluating *struct-expr* must be an instance of the structure type named by *struct-id*. The result of the `copy-struct` expression is a fresh instance of *struct-id* with the same field values as the result of *struct-expr*, except that the value for the field accessed by each *accessor-id* is replaced by the result of *field-expr*.

The result of *struct-expr* might be an instance of a sub-type of *struct-id*, but the result of the `copy-struct` expression is an immediate instance of *struct-id*. If *struct-expr* does not produce an instance of *struct-id*, the `exn:fail:contract` exception is raised.

If any *accessor-id* is not bound to an accessor of *struct-id* (according to the expansion-time information associated with *struct-id*), or if the same *accessor-id* is used twice, then a syntax error is raised.

```
(define-struct/properties id (field-id ...)
                          ((prop-expr val-expr) ...)
                          maybe-inspector-expr)

maybe-inspector-expr =
                     | expr
```

Like `define-struct` from `mzscheme`, but properties can be attached to the structure type. Each *prop-expr* should produce a structure-type property value, and each *val-expr* produces the corresponding value for the property.

Examples:

```
> (define-struct/properties point (x y)
    ([prop:custom-write (lambda (p port write?)
                          (fprintf port "(~a, ~a)"
                                   (point-x p)
                                   (point-y p)))]))
> (display (make-point 1 2))
(1, 2)
```

```
(make-->vector struct-id)
```

Builds a function that accepts a structure type instance (matching *struct-id*) and provides a vector of the fields of the structure type instance.

45 mzlib/stxparam

(require mzlib/stxparam) package: compatibility-lib

NOTE: This library is deprecated; use racket/stxparam, instead. Also see racket/stxparam-exptime.

Re-exports scheme/stxparam and scheme/stxparam-exptime (both at phase level 0).

46 mzlib/surrogate

```
(require mzlib/surrogate)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/surrogate, instead.

Re-exports scheme/surrogate.

47 mzlib/tar

(require mzlib/tar) package: compatibility-lib

NOTE: This library is deprecated; use file/tar, instead.

Re-exports file/tar.

48 mzlib/thread

```
(require mzlib/thread)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/engine, instead.

Re-exports the bindings from racket/engine under different names and also provides two extra bindings. The renamings are:

- engine as coroutine
- engine? as coroutine?
- engine-run as coroutine-run
- engine-result as coroutine-result
- engine-kill as coroutine-kill

```
(consumer-thread f [init]) → thread? procedure?
  f : procedure?
  init : (-> any) = void
```

Returns two values: a thread descriptor for a new thread, and a procedure with the same arity as *f*.

When the returned procedure is applied, its arguments are queued to be passed on to *f*, and #<void> is immediately returned. The thread created by consumer-thread dequeues arguments and applies *f* to them, removing a new set of arguments from the queue only when the previous application of *f* has completed; if *f* escapes from a normal return (via an exception or a continuation), the *f*-applying thread terminates.

The *init* argument is a procedure of no arguments; if it is provided, *init* is called in the new thread immediately after the thread is created.

```
(run-server  port-no
             conn-proc
             conn-timeout
            [handler
             listen
             close
             accept
             accept/break]) → void?
  port-no : (integer-in 1 65535)
  conn-proc : (input-port? output-port? . -> . any)
```

```
conn-timeout : (and/c real? (not/c negative?))
handler : (exn? . -> . any/c) = void
listen : ((integer-in 1 65535) (one-of/c 5) (one-of/c #t)
          . -> . listener?)
       = tcp-listen
close : (listener? . -> . any) = tcp-close
accept : (listener? . ->* . (input-port? output-port?))
       = tcp-accept
accept/break : (listener? . ->* . (input-port? output-port?))
             = tcp-accept/enable-break
```

Executes a TCP server on the port indicated by *port-no*. When a connection is made by a client, conn is called with two values: an input port to receive from the client, and an output port to send to the client.

Each client connection is managed by a new custodian, and each call to conn occurs in a new thread (managed by the connection's custodian). If the thread executing conn terminates for any reason (e.g., conn returns), the connection's custodian is shut down. Consequently, conn need not close the ports provided to it. Breaks are enabled in the connection thread if breaks are enabled when run-server is called.

To facilitate capturing a continuation in one connection thread and invoking it in another, the parameterization of the run-server call is used for every call to *handler*. In this parameterization and for the connection's thread, the current-custodian parameter is assigned to the connection's custodian.

If *conn-timeout* is not #f, then it must be a non-negative number specifying the time in seconds that a connection thread is allowed to run before it is sent a break signal. Then, if the thread runs longer than (* *conn-timeout* 2) seconds, then the connection's custodian is shut down. If *conn-timeout* is #f, a connection thread can run indefinitely.

If *handler* is provided, it is passed exceptions related to connections (i.e., exceptions not caught by *conn-proc*, or exceptions that occur when trying to accept a connection). The default handler ignores the exception and returns #<void>.

The run-server function uses *listen*, *close*, *accept* and *accept/break* in the same way as it might use tcp-listen, tcp-close, tcp-accept, and tcp-accept/enable-break to accept connections. Provide alternate procedures to use an alternate communication protocol (such as SSL) or to supply optional arguments in the use of tcp-listen. The listener? part of the contract indicates that the procedures must all work on the same kind of listener value.

The run-server procedure loops to serve client connections, so it never returns. If a break occurs, the loop will cleanly shut down the server, but it will not terminate active connections.

49 mzlib/trace

(require mzlib/trace) package: compatibility-lib

NOTE: This library is deprecated; use racket/trace, instead.

Re-exports racket/trace.

50 mzlib/traceld

```
(require mzlib/traceld)
```
package: compatibility-lib

The mzlib/traceld library does not provide any bindings. Instead, mzlib/traceld is required for its side-effects.

The mzlib/traceld library installs a new load handler (see current-load) and load-extension handler (see current-load-extension) to print information about the files that are loaded. These handlers chain to the current handlers to perform the actual loads. Trace output is printed to the port that is the current error port (see current-error-port) when the library is instantiated.

Before a file is loaded, the tracer prints the file name and "time" (as reported by the procedure current-process-milliseconds) when the load starts. Trace information for nested loads is printed with indentation. After the file is loaded, the file name is printed with the "time" that the load completed.

51 mzlib/trait

(require mzlib/trait) package: compatibility-lib

NOTE: This library is deprecated; use racket/trait, instead.

Re-exports scheme/trait.

52 mzlib/transcr

```
(require mzlib/transcr)
```
package: compatibility-lib

The transcript-on and transcript-off procedures of mzscheme always raise exn:fail:unsupported. The mzlib/transcr library provides working versions of transcript-on and transcript-off.

```
(transcript-on filename) → any
  filename : any/c
(transcript-off) → any
```

Starts/stops recording a transcript at *filename*.

53 mzlib/unit

```
(require mzlib/unit)
```
package: compatibility-lib

NOTE: This library is deprecated; use racket/unit, instead.

The mzlib/unit library mostly re-provides racket/unit, except for struct and struct/ctc from racket/unit.

```
(struct id (field-id ...) omit-decl ...)

omit-decl = -type
          | -selectors
          | -setters
          | -constructor
```

A signature form like struct from racket/base, but with a different syntax for options that limit exports.

```
(struct/ctc id ([field-id contract-expr] ...) omit-decl ...)

omit-decl = -type
          | -selectors
          | -setters
          | -constructor
```

A signature form like struct/ctc from racket/unit, but with a different syntax for the options that limit exports.

```
struct~r
struct~r/ctc
```

The same as struct from racket/base and struct/ctc from racket/unit.

```
struct~s
struct~s/ctc
```

Like struct~r and struct~r/ctc, but the constructor is named the same as the type, instead of with make- prefix.

54 mzlib/unit-exptime

(require mzlib/unit-exptime) package: compatibility-lib

NOTE: This library is deprecated; use racket/unit-exptime, instead.

Re-exports scheme/unit-exptime.

55 mzlib/unit200

(require mzlib/unit200) package: compatibility-lib

NOTE: This library is deprecated; use racket/unit, instead.

The mzlib/unit200 library provides an old implementation of units. See archived version 360 documentation on the "unit.ss" library of the "mzlib" collection for information about this library.

56 mzlib/unitsig200

(require mzlib/unitsig200) package: compatibility-lib

NOTE: This library is deprecated; use racket/unit, instead.

The mzlib/unit200 library provides an old implementation of units. See archived version 360 documentation on the "unitsig.ss" library of the "mzlib" collection for information about this library.

57 mzlib/zip

(require mzlib/zip) package: compatibility-lib

NOTE: This library is deprecated; use file/zip, instead.

Re-exports file/zip.

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