Quickscript, a scripting plugin for DrRacket

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```
(require quickscript)
```
package: quickscript

1 Introduction

Quickscript's makes it easy to extend DrRacket with small Racket scripts to automate some actions in the editor, while avoiding the need to restart DrRacket.

Creating a new script is as easy as a click on *Scripts* | *New script...*. Each script is automatically added as an item to the *Scripts* menu, without needing to restart DrRacket. A keyboard shortcut can be assigned to a script (via the menu item). By default, a script takes as input the currently selected text, and outputs the replacement text. There is also direct access to some elements of DrRacket GUI for advanced scripting, like DrRacket's frame and the definition or interaction editor.

2 Installation

Quickscript is installed automatically with DrRacket, so you don't need to do anything.

2.1 Installing scripts: Quickscript Extra

You can use Quickscript on its own, but the Quickscript Extra package has a wide range of useful scripts as well as some example scripts intended for customisation by the user.

To install it, either look for `quickscript-extra` in the DrRacket menu *File|Package Manager*, or run the raco command:

```
raco pkg install quickscript-extra
```

Then click on *Scripts|Manage|Compile scripts*. (There is no need to restart DrRacket.)

2.2 Installing scripts: More scripts

More scripts can be found on the Racket wiki—you can add your own scripts there too if you think they may be useful to others.

3 Make your own script: First simple example

Click on the *Scripts*|*Manage*|*New script...* menu item, and enter *Reverse* for the script name. This creates and opens the file reverse.rkt in the user's scripts directory. Also, a new item automatically appears in the *Scripts* menu.

In the .rkt file that just opened in DrRacket, modify the `define-script` definition to the following:

```
(define-script reverse-selection
  #:label "Reverse"
  (λ (selection)
    (list->string (reverse (string->list selection)))))
```

and save the file.

Then go to a new tab, type some text, select it, and click on *Scripts*|*Reverse*, and voilà!

4 Into more details

Quickscript adds a *Scripts* menu to the main DrRacket window. This menu has several items, followed by the list of scripts.

The *New script* item asks for a script name and creates a corresponding .rkt file in the user's script directory, and opens it in DrRacket.

Each scripts is defined with `define-script`, which among other things adds an entry in DrRacket's Scripts menu. A single script file can contain several calls to `define-script`.

By default, the new script is reduced to its simplest form. However, scripts can be extended with several optional *properties* and *arguments*. When all of them are used, a script can look like this:

```
(define-script a-complete-script
  ; Properties:
  #:label "Full script"
  #:help-string "A complete script showing all properties and ar-
guments"
  #:menu-path ("Submenu" "Subsubmenu")
  #:shortcut #\a
  #:shortcut-prefix (ctl shift)
  #:output-to selection
  #:persistent
  #:os-types (unix macosx windows)
  ; Procedure with its arguments:
  (λ (selection #:frame fr
                #:editor ed
                #:definitions defs
                #:interactions ints
                #:file f)
    "Hello world!"))
```

Note that the arguments of the properties are literals, not expressions, so they must *not* be quoted. Below we detail first the procedure and its arguments and then the script's properties.

```
(define-script name
  property ...
  proc)
```

```
       property = #:label label-string
                | #:help-string string
                | #:menu-path (label-string ...)
                | #:shortcut char | symbol | #f
                | #:shortcut-prefix (shortcut-prefix ...)
                | #:persistent? #t | #f
                | #:output-to output-to
                | #:os-types (os-type ...)

shortcut-prefix = alt | cmd | meta | ctl | shift | option

      output-to = selection | new-tab | message-box | clipboard | #f

        os-type = macosx | unix | windows

           proc = (λ (selection-id
                      [#:editor editor-id]
                      [#:definitions definitions-id]
                      [#:interactions interactions-id]
                      [#:frame frame-id]
                      [#:file file-id])
                    body-expr ...
                    return-expr)
```

See the following subsections for a complete description.

Observe again that the arguments of the properties are literals and not expressions. This is because the script file is read twice for different purposes. The first time, Quickscript reads the script file to extract the minimum information necessary to build the menu items in DrRacket. No Racket operation is performed at this stage so as to be as light and quick as possible. Then, when the corresponding menu item is clicked, Quickscript reads the script file a second time, this time to actually read and visit the Racket module and call the corresponding procedure. That is, the script modules are instantiated only on demand to reduce the loading time and memory footprint.

4.1 The script's procedure

When clicking on a script label in the Scripts menu in DrRacket, its corresponding procedure is called. The procedure takes at least the `selection` argument, which is the string that is currently selected in the current editor. The procedure must returns either `#f` or a `string?`. If it returns `#f`, no change is applied to the current editor, but if it returns a string, then the current selection is replace with the return value.

If some of the above keywords are specified in the procedure, Quickscript detects them and

passes the corresponding values, so the procedure can take various forms:

```
(λ (selection) ....)
(λ (selection #:frame fr) ....)
(λ (selection #:file f) ....)
(λ (selection #:editor ed #:file f) ....)
....
```

Here is the meaning of the keyword arguments:

- `#:file : (or/c path? #f)`

  The path to the current file of the definition window, or `#f` if there is no such file (i.e., unsaved editor).

  Example:

  ```
  (define-script current-file-example
    #:label "Current file example"
    #:output-to message-box
    (λ (selection #:file f)
      (string-append "File: " (if f (path->string f) "no-file")
                     "\nSelection: " selection)))
  ```

  See also: `file-name-from-path`, `filename-extension`, `path->string`, `split-path`.

- `#:definitions : text%`

  The `text%` editor of the current definition window. See `text%` for more details.

- `#:interactions : text%`

  The `text%` editor of the current interaction window. Similar to `#:definitions`.

- `#:editor : text%`

  The `text%` current editor, either the definition or the interaction editor. Similar to `#:definitions`.

- `#:frame : drracket:unit:frame<%>`

  DrRacket's frame. For advanced scripting.

  Example:

  ```
  (require racket/class)
  (define-script number-tabs
    #:label "Number of tabs"
    #:output-to message-box
    (λ (selection #:frame fr)
      (format "Number of tabs in DrRacket: ~a"
              (send fr get-tab-count))))
  ```

Note: A script procedure can have additional optional arguments (keyword or not) and rest arguments, but not additional mandatory arguments. For example:

```
(define-script append-plop
  #:label "Append plop"
  (λ (selection [more ""] #:even-more [even-more ""])
    (string-append selection "_plop" more even-more)))

(define-script append-plop-plip
  #:label "Append plop plip ploop"
  (λ (selection)
    ; Call the first script's procedure:
    (append-plop selection "_plip" #:even-more "_ploop")))
```

4.2 The script's properties

The properties are mere data and cannot contain expressions.

Most properties (`#:label`, `#:shortcut`, `#:shortcut-prefix`, `#:help-string`) are the same as for the `menu-item%` constructor. In particular, a keyboard shortcut can be assigned to an item.

If a property does not appear in the dictionary, it takes its default value.

There are some additional properties:

- `#:menu-path : (listof string?) = ()` This is the list of submenus in which the script's label will be placed, under the Script menu.

  Note that different scripts in different files can share the same submenus.

- `#:output-to : (or/c selection new-tab message-box clipboard #f) = selection`

  If `selection`, the output of the procedure replaces the selection in the current editor (definitions or interactions), or insert the output at the cursor if there is no selection. If `new-tab`, the return value is written in a new tab. If `message-box`, the return value (if a string) is displayed in a `message-box`. If `clipboard`, the return value (if a string) is copied to the clipboard. If `#f`, the return value is not used.

  If this value is changed, make sure to reload the menu with *Scripts|Manage|Reload menu*.

- `#:persistent`

  If they keyword `#:persistent` is *not* provided, each invocation of the script is done in a fresh namespace.

But if `#:persistent` is provided, a fresh namespace is created only the first time it is invoked, and the same namespace is re-used for the subsequent invocations. Note that a single namespace is kept per file, so if different scripts in the same file are marked as persistent, they will all share the same namespace (and, thus, variables). Also note that a script marked as non-persistent will not share the same namespace as the other scripts of the same file marked as persistent.

Consider the following script:

```
(define count 0)

(define-script persistent-counter
  #:label "Persistent counter"
  #:persistent
  #:output-to message-box
  (λ (selection)
    (set! count (+ count 1))
    (number->string count)))
```

If the script is persistent, the counter increases at each invocation of the script via the menu, whereas it always displays 1 if the script is not persistent.

Note: Persistent scripts can be stopped and reset by clicking on the *Scripts|Manage|Stop persistent scripts* menu item. In the previous example, this will reset the counter. Make sure to stop a persistent script after editing it. *Scripts|Manage|Reload menu* and *Scripts|Manage|Compile scripts* also stop persistent scripts.

Technical point: The script's procedure is called *outside* of the namespace that was used to `dynamic-require` it, and inside DrRacket frame's namespace so as to have access to objects in this frame.

- `#:os-types (listof (one-of/c unix macosx windows))`

  This keyword must be followed by a list of supported os-types. Defaults to all types, i.e. `(unix macosx windows)`.

If changes are made to these properties, the Scripts menu will probably need to be reloaded by clicking on *Scripts|Manage|Reload menu*.

5 Hooks

A script function defined with `define-script` always adds a menu item, and is called only when the menu item is clicked or called.

By contrast, script functions defined with `define-hook` do not add a menu item, but are run automatically on specific events — see the list below.

```
(define-hook name
  property ...
  proc)

property = #:help-string string
         | #:persistent? #t | #f
         | #:os-types (os-type ...)

 os-type = macosx | unix | windows

    proc = (λ ([#:editor editor-id]
               [#:definitions definitions-id]
               [#:interactions interactions-id]
               [#:frame frame-id]
               [#:file file-id]
              other-kwargs ...)
             body-expr ...
             return-expr)
```

Defines a hook. The hook identifier *name* must be one of the supported hooks (see list below).

See `define-script` for information regarding the keyword arguments of the script function, and the properties of the script. Note that a hook function does not have a `selection-id` argument. Each hook may receive additional optional arguments in *other-kwargs*, but as for scripts, these arguments are optional and do not need to be specified in the hook function's signature: Quickscript recognizes which keywords are asked for by the hook.

The additional keywords accepted by the hook function are the arguments of the original method or function.

For example, the following hook displays a message box when a file is loaded in DrRacket:

```
(define-hook after-load-file
  (λ (#:file f #:in-new-tab? new-tab?)
    (message-box "on-load-file" (format "f: ~a\n new-tab?:
~a" f new-tab?))))
```

DrRacket's frame is always available via the `#:frame` keyword.

Note: While *scripts* default keyword arguments always correspond to current tab (the one in focus), hooks may be called on other tabs.

List of supported hooks, with the additional keywords within parentheses:

- `after-load-file (#:in-new-tab?)` : called after a file is loaded in an existing tab or in a new tab.
- `on-save-file (#:save-filename #:format)` : called before the file is saved.
- `after-save-file ()` : called after a file is saved.
- `after-create-new-tab ()` : called when a new tab is created.
- `on-tab-change (#:tab-from #:tab-to)` : called when the keyboard focus changes from `#:tab-from` to `#:tab-to`.
- `on-tab-close (#:tab)` : called before the tab is closed.
- `on-startup ()` : called when DrRacket starts, but before the frame is shown.
- `after-create-new-drracket-frame (#:show)`: called after a new DrRacket frame is created.
- `on-close ()` : called when a DrRacket frame is closed.

6 Script library

When the user creates a new script, the latter is placed into a sub-directory of `(find-system-path 'pref-dir)`. A direct access to this folder is provided via the *Scripts|Manage|Open script...* menu entry.

Additional directories to look for scripts can be added via the *Scripts|Manage|Library* menu entry. When a directory is added to the library, all its .rkt files (non-recursively) are considered as scripts. Specific files can be excluded from the library.

7 Shadow scripts

When a script is installed from a third party package (like quickscript-extra), it comes with its set of own values for its properties. These values may not suit the user who may want to redefine some of them, like the menu path or the keyboard shortcuts. An obvious choice for the user is to copy/paste the entire script, but this would prevent from benefiting from further bug fixes and enhancements made by the writer of the original script.

To solve this problem, the user can instead make a *shadow script*, which creates a new script in the user's directory, with its own set of properties that can be changed by the user, but the procedure of this script is bound to that of the original script.

To make a shadow script, open the script library in *Scripts|Manage|Library*, navigate to the third-party script and click on *Shadow*.

8 Updating the quickscript package

To update Quickscript once already installed, either do so through the *File|Package Manager* menu in DrRacket, or run `raco pkg update quickscript`.

The user's scripts will not be modified in the process.

9 Distributing your own scripts

The *simplest* way to distribute a small script s to publish it as a gist or on PasteRack, and share the link. A user can then copy/paste the contents into a new script. Don't forget to include a permissive license such as MIT/Apache 2.

10 License

Apache-2.0 or MIT License, at your option.

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