GE Smallworld Emacs 25.3~29.3 (64~bit) Extensions

That You too might find useful

Image from Wikipedia

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"Emacs is not an editor. Emacs is a way of thinking about the world, and as such is a way of thinking about editors. When you ask what Emacs does, you are asking a question with no answer, because Emacs doesn't do, it is done to. Emacs just is … I hope this makes things clearer." ~

Scott Dorsey

Why is it called – Emacs?
The name 'Emacs' was originally chosen as an abbreviation of **E**ditor **MAC**ro**S** and was created by Free Software Foundation.

This document includes highlights of some new and existing features and fine points in this customised version of Emacs 29.1

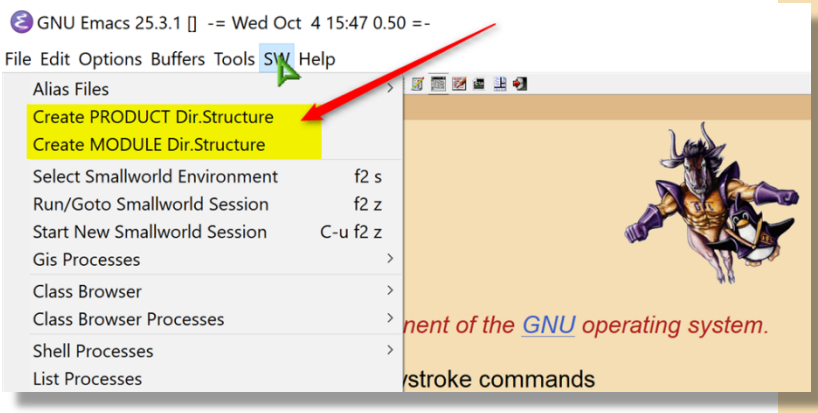
This customised version based on the GNU Emacs 29.3 (x86_64-w64-mingw32) of 2020-08-21 and Smallworld additions to the Emacs release with GE Smallworld 4.3.

Some screenshots used from Emacs 25.3.1

All comments and suggestions please forward to <igor@hydepark-consulting.com> . You can download this Emacs from HydePark-Consulting.com/Emacs and view explanations of added features and Emacs useful tips on MagikEmacs.com

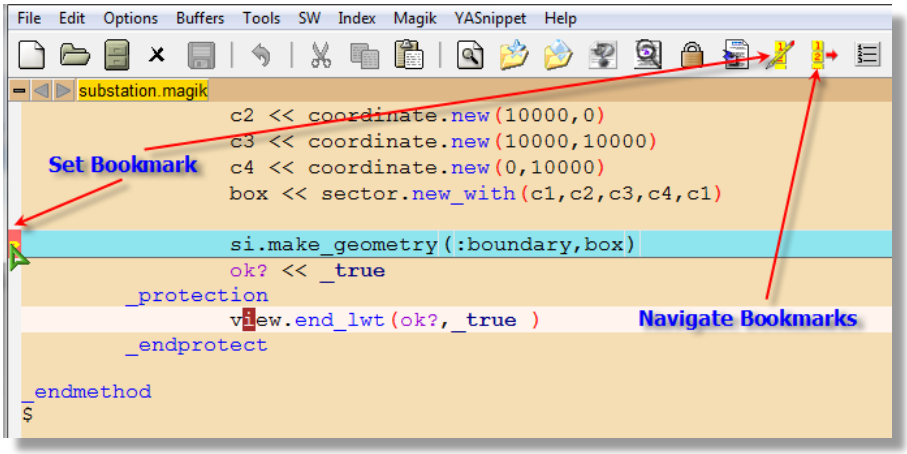
Creating complete directory structure

Creating complete ***directory structure*** with few default files (*product.def, module.def and load_list.txt*) **for a PRODUCT or MODULE** using Emacs menu options. See examples for TEST_PRODUCT & test_module directories:



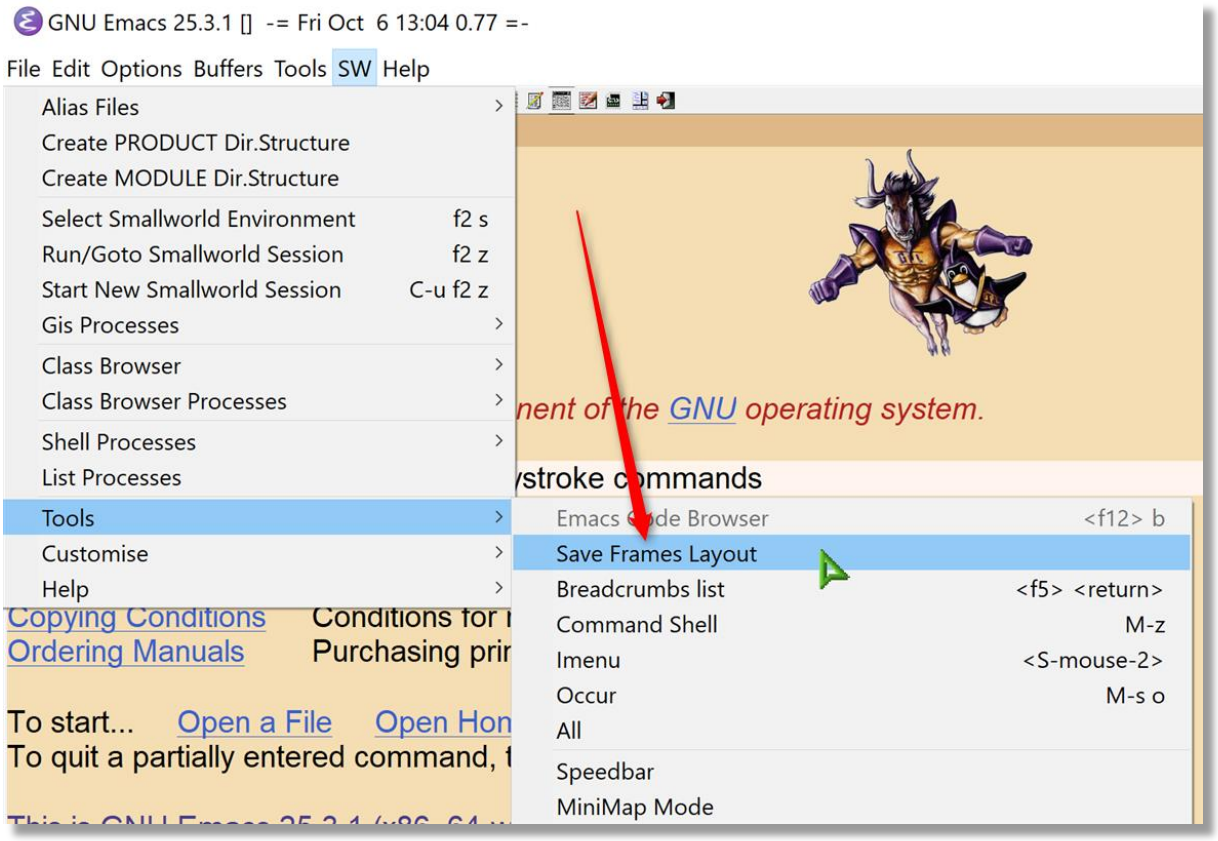
Visual Bookmarks

- **Visual Bookmarks** provides easily visible bookmarks, which can be set/cleared via **CTRL-F5** and Toolbar icon OR simply by *clicking on a LEFT fringe.* Navigation between bookmarks F5-n/F5-p or using the Toolbar icon. List bookmarks - use Alt-x 'bm-show' (current buffer) and Alt-x 'bm-show-all' (all open buffers).



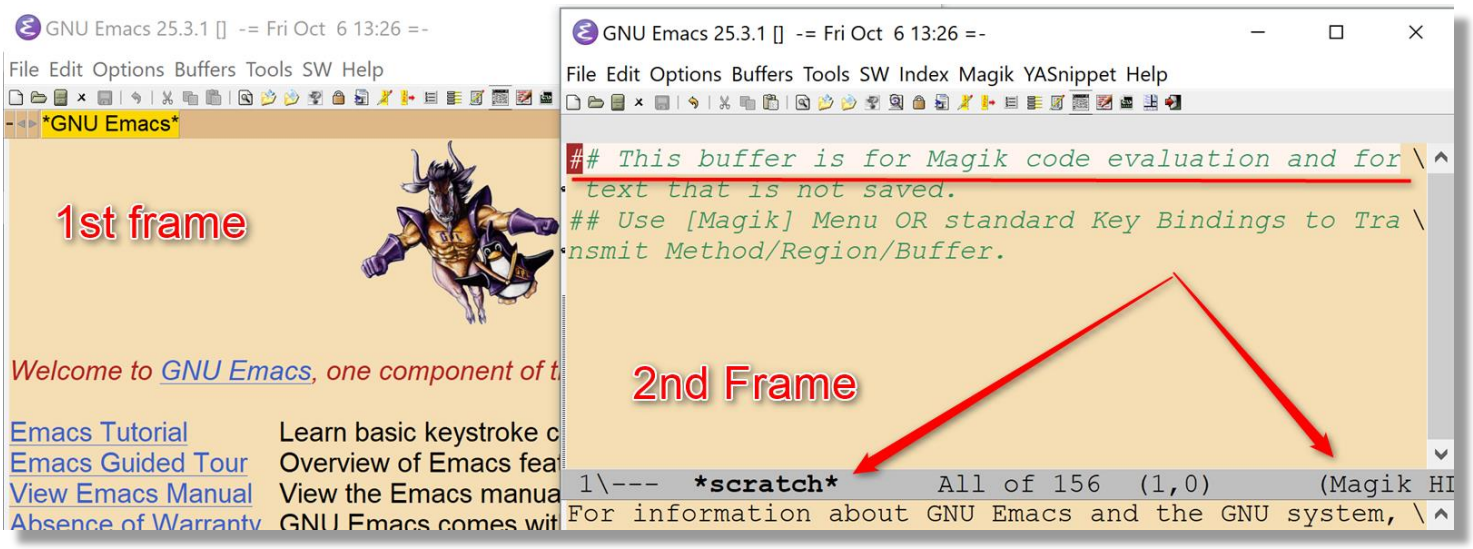
Create & Save Frames Layout

- **Save Frames Layout** – allows to save the current Emacs Frames layout (number of Frames and positions on a screen) and restore saved Frames configuration on Emacs startup.



EXAMPLE: I always use 2(Two) Emacs Frames – 1st Frame split horizontally (Ctrl-x-2) with *gis* buffer (locked/dedicated mode) and Class Browser, 2nd Frame using for coding. So, I use this feature to save the Frames Layout and restore on the startup. **Use <Alt-f> to switch between frames.**

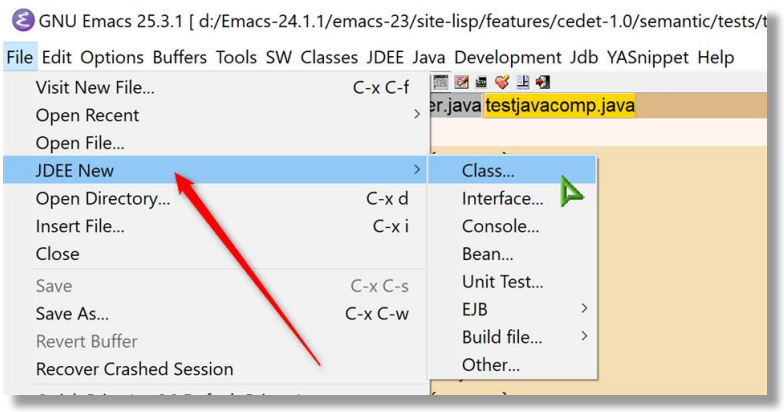
New Use of Scratch Buffer

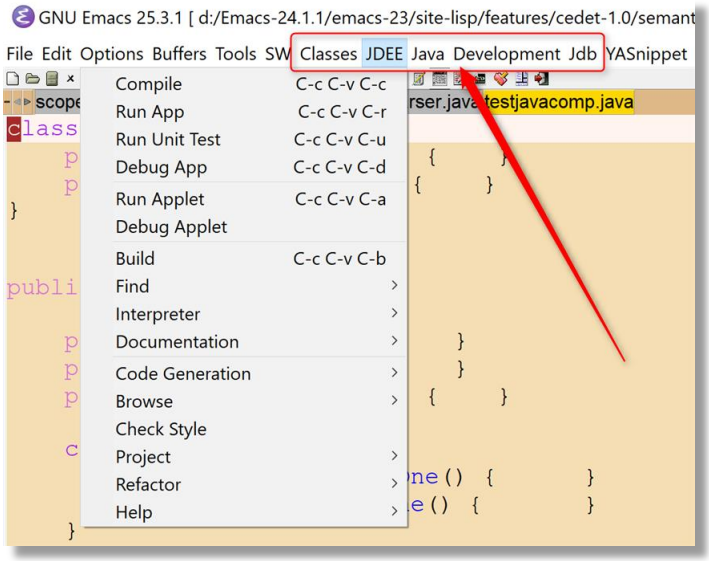


NOTE: another NEW feature - now the ***scratch*** buffer **can be used for Magik** code evaluation (see above)

Java Development Environment for Emacs (JDEE)

- The **Java Development Environment for Emacs (JDEE)** is an add on software package for Emacs that assists in Java programming. JDEE provides ability editing, compiling, running, debugging, and browsing large Java programs.



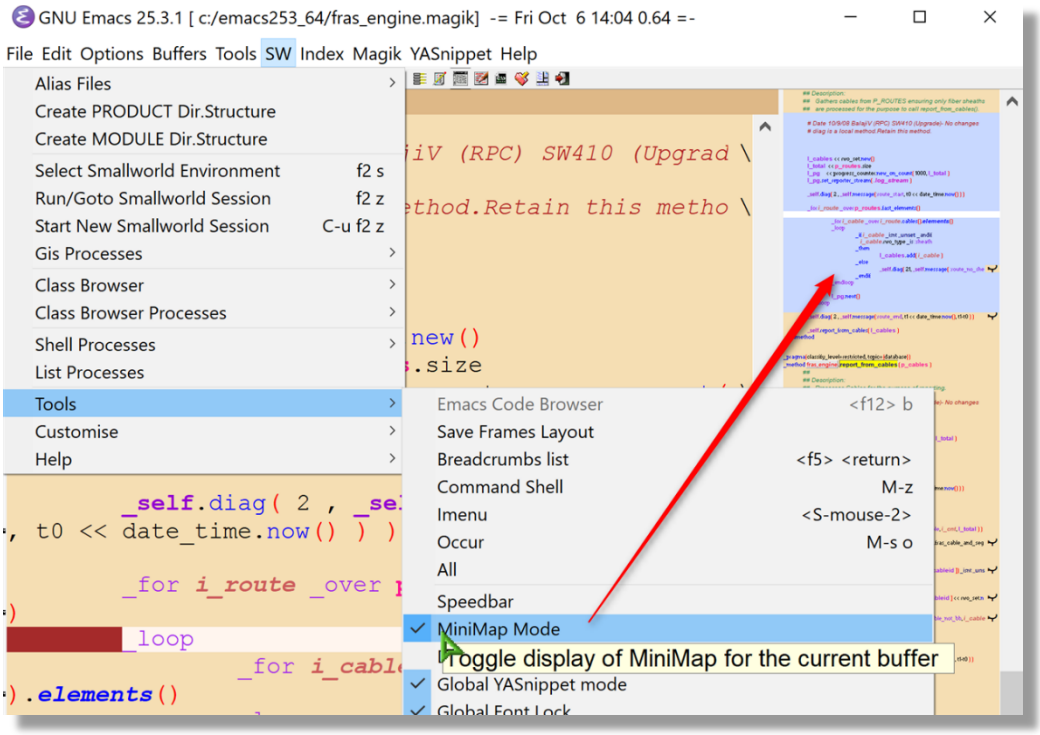


Before you can use the JDEE you must tell it where the Java compiler, debugger, and virtual machine are located on your system. Refer to < "…\emacs293\share\emacs\29.3\site-lisp\features\jdee-2.4.2***Emacs JDE User's Guide.html***"> on how to select and register JDK. Or simply edit these values in the "…***.emacs-custom***":

```
'(jdee-jdk (quote ("11.0")))
'(jdee-jdk-registry (quote (("11.0" . "C:\\Java\\jdk-11"))))
```

MiniMap MOde

- **MINIMAP mode** - smaller display of the current buffer on the left side. It highlights the currently shown region and updates its position automatically. You can navigate in the minibar by dragging the active region with the mouse, which will scroll the corresponding edit buffer.



Two simply useful new features:

- Use **Ctrl-Shft-d** to **duplicate** current line of code
- Use **Ctr-Alt-Up/Down** arrow to **move current line** or selected **block of text** Up and Down

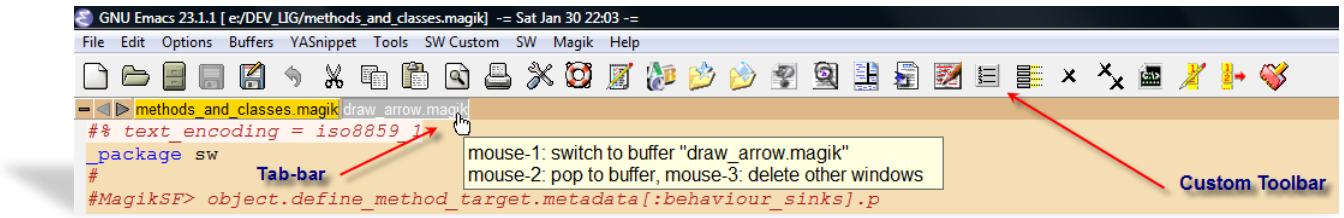
Watch MagikEmacs.com for more explanations on custom features of Emacs IDE for GE Smallworld.

Intelligent AutoComplete (*thank you to Andrew Maguire, GE*), which understands classes, methods(functions) and even <_self> - offering only methods defined on "self" class :

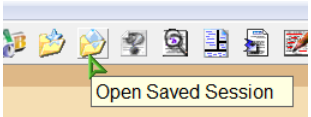
```
_pragma(classify_level=restricted)
_method substation.get_spatial_context_names()
        ##
        ## Returns extra spatial context names to add to the
        ## application defined spatial contexts.
        ##

        >> { :internals }

_endmethod
$
_pragma(classify_level=debug)
_method substation.draw_internals(window, my_geometry, rwo_style, draw_flag?)
        ##
        ## A draw method whch renders the substation's internal world
        ## within the bounds of its geographic location geometry.
        ##

        _dynamic !current_rendering_context!

        _self.get_spatial_context_names()
        geom get_spatial_context
        ace_ get_spatial_context()                    f
        an_s get_spatial_context_names                f
             get_spatial_context_names()              f
        _if  get_spatial_context_element_for_world()  f
             ( gsf << rc.geometry_set_factory ) _isnt _unset
        _then
                display_scale_name << :auto
                an_sts << gsf.get_style_system_for( ace_name, display_scale_name )
        _endif
```

```
get_spatial_context_names()
  RESTRICTED!
 Returns extra spatial context names to add to the
 application defined spatial contexts.
```

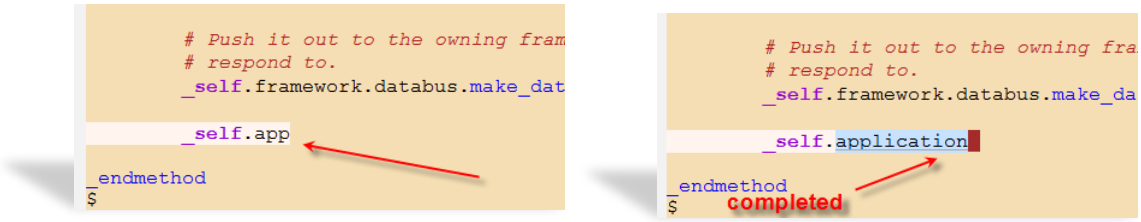
Custom Toolbar and Tab-bar (use <Ctrl-Tab> to navigate between tabs).



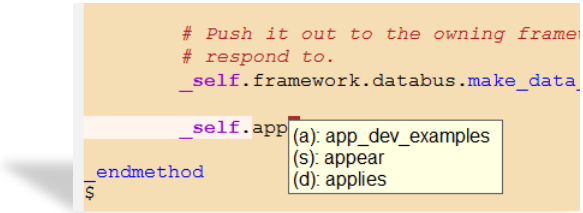
Save/Restore editing Sessions, which allows you with one click of a button to load multiple files from a previous closed editing session. Even a cursor positions in the open files will be preserved from the previous session.



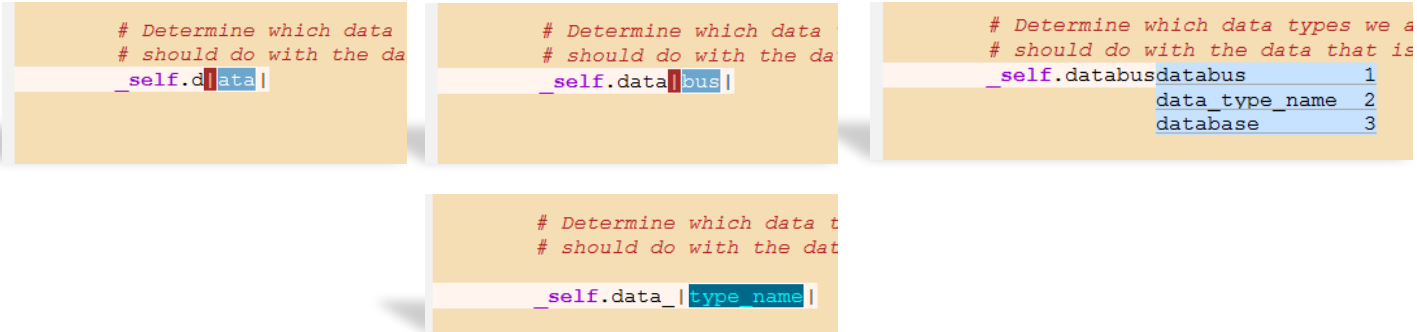
Dynamic Abbreviation - it is a standard function in the Emacs, but, from my experience, not everybody knows about. It is allowing you to write just a few characters of words you've written earlier to be able to expand them. Possible completions searched in the text in the current buffer, and if not found there, in all open buffers. To expand a word, just put the point right after the word and press <Alt-/>. As soon as you start typing – you are able to use this feature. Typing the next letter will automatically narrow your possible completions.



Dynamic Abbreviation with Expansion of Multiple choices – press the same key second time and you will get multi-choice candidates in a tooltip.

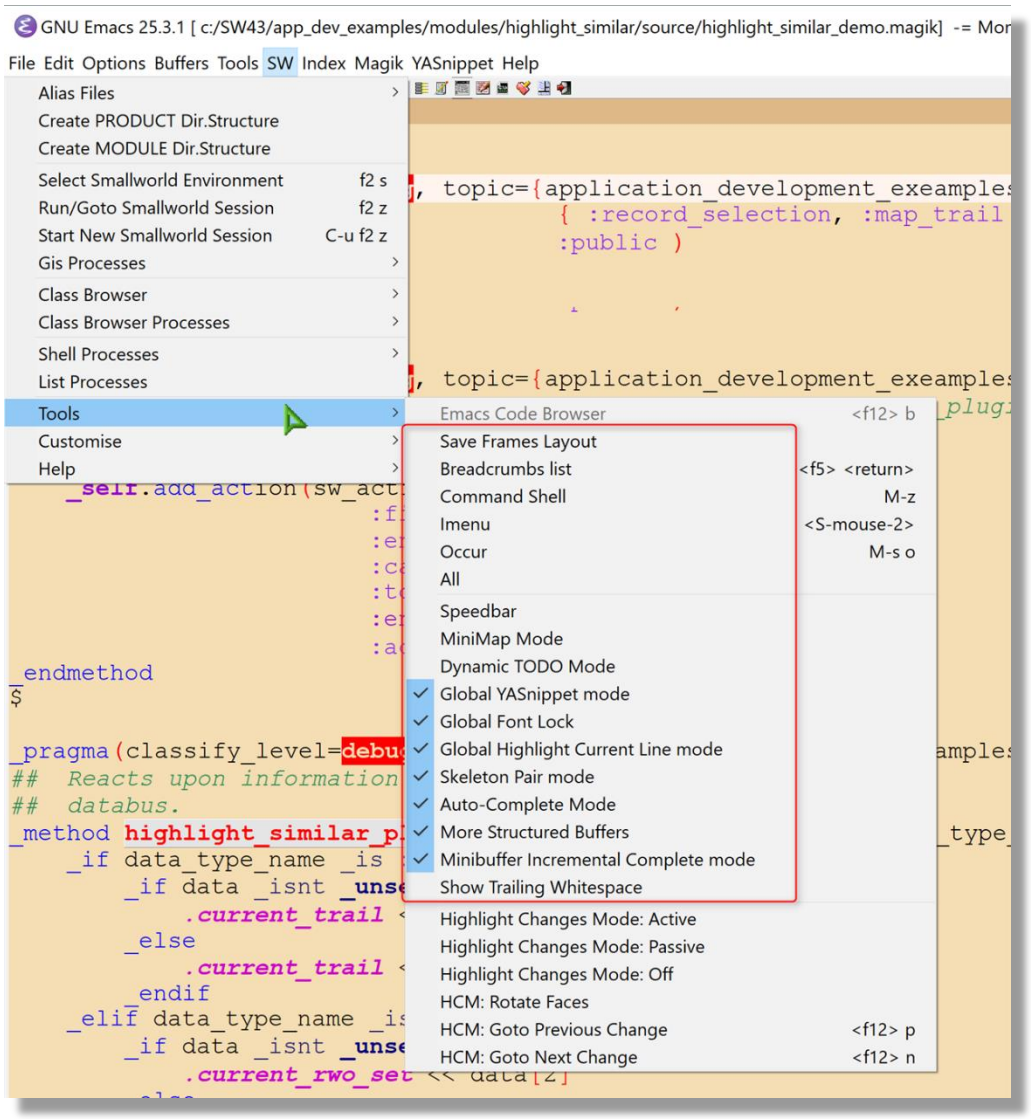


Predictive Abbreviation. It's fairly similar to Dynamic Abbreviation expansion, which works based on the contents of the current buffer (or other buffers). Predictive abbreviation expansion works based on the previously written text. Unlike Dynamic Abbreviation, the text is analysed during idle time, while Emacs is doing nothing else. **As you type you will be offered possible expansion for the word at the left from the cursor position**. Typing new characters will automatically offer different completion. If the correct completion is offered – just press <Tab> to complete the word. Light blue colour indicates that there are possible different candidates for the expansion. To see other candidates – press <Tab> once again and choice of possible completions will be shown. If the completion is shown in the dark blue colour – that's mean this is the only possible candidate.



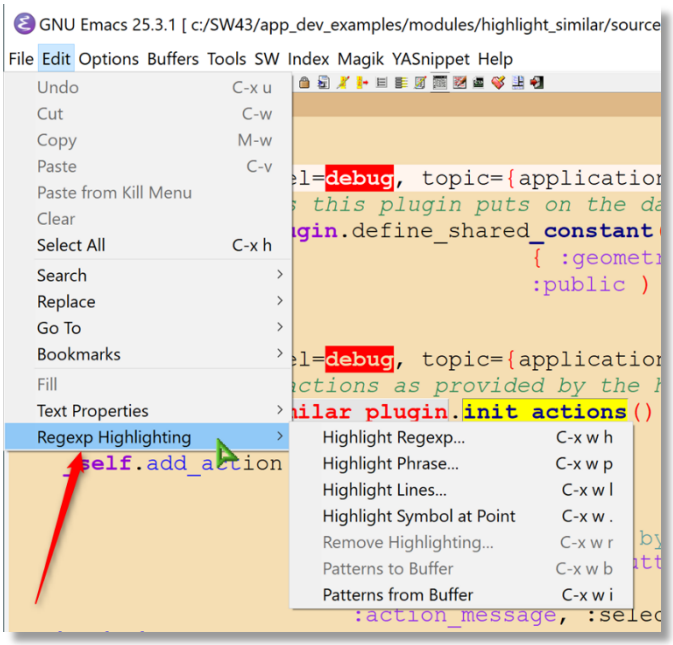
Automatic insertion of the corresponding {{[and “. Thus typing `(' will normally insert `()' and put the cursor between them. Otherwise, when the region is active, it will be wrapped in the parentheses.

Use SW->Tools menu to activate/deactivate many useful options.



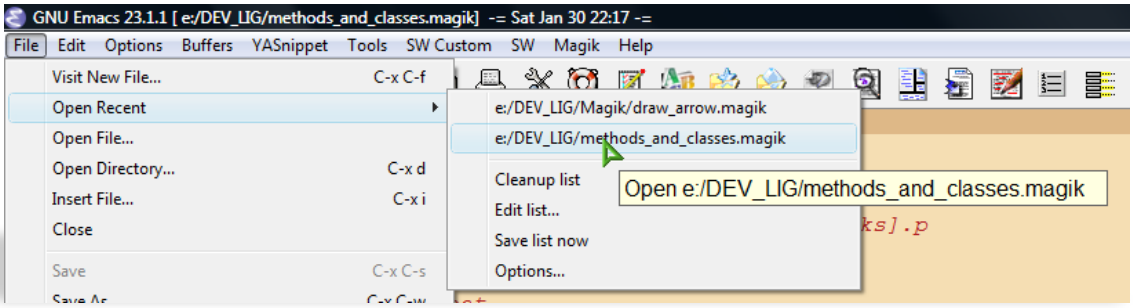
Highlight text matching PATTERN

. Examples: In a source code highlight a variable to quickly see all places it is modified or referenced. New occurrences of that variable will be highlighted as they are typed. In a *gis* or another buffer that is showing lots of output, highlight the parts of the output you're interested in. Those patterns will be highlighted as soon as they appear in the buffer. Useful if you have a lot of output during debugging. This option is located on the Edit menu.

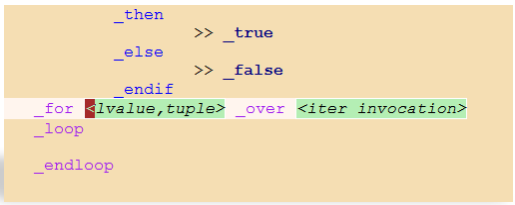


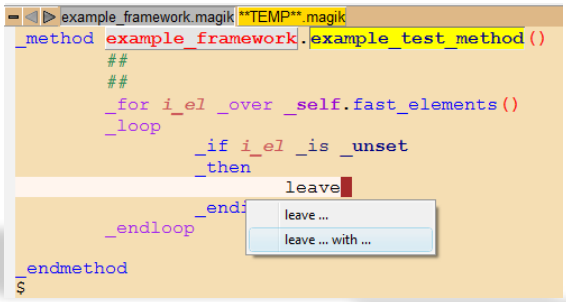
Open Recent Files

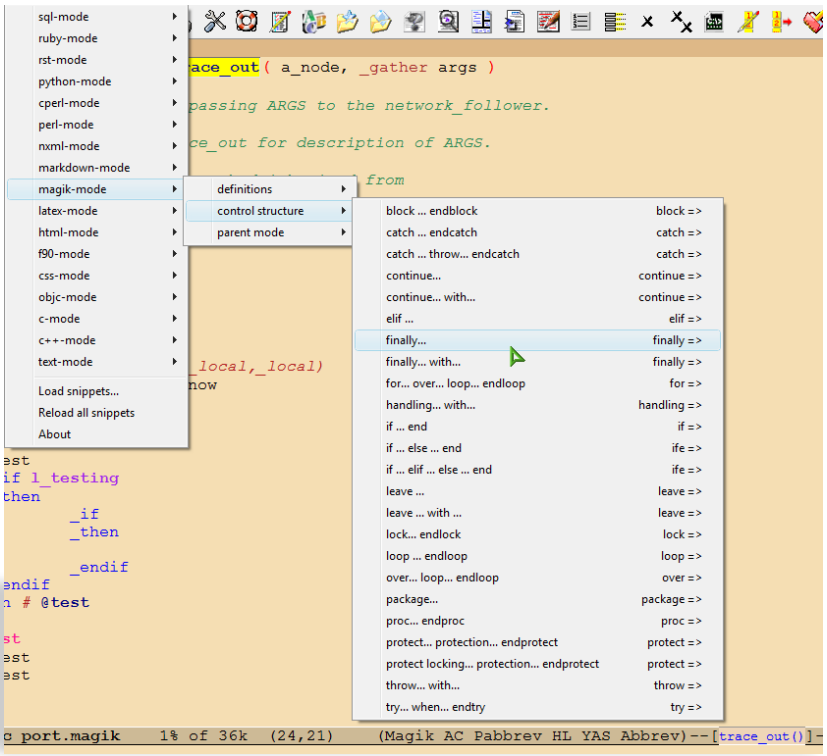
- Additional menu item for visiting files that were operated on recently



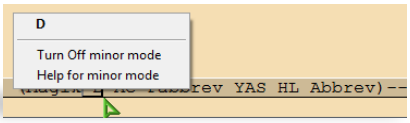
Snippets for Magik Coding. It allows you to type an abbreviation and automatically expand it into function templates (similar to electric-magik). Navigation between snippet fields – using <Tab>. Templates will expand automatically as you type them and they are available via menu too.







Dedicated mode - when a  buffer is "dedicated" or locked, Emacs will not select files into that buffer. Dedicated buffers will have "D" shown in the mode line and marked lock icon. I found it very useful to lock the *gis* buffer. NOTE: All minor modes are shown in the mode line and you can use the mouse to switch it OFF or get Help on the specific mode.

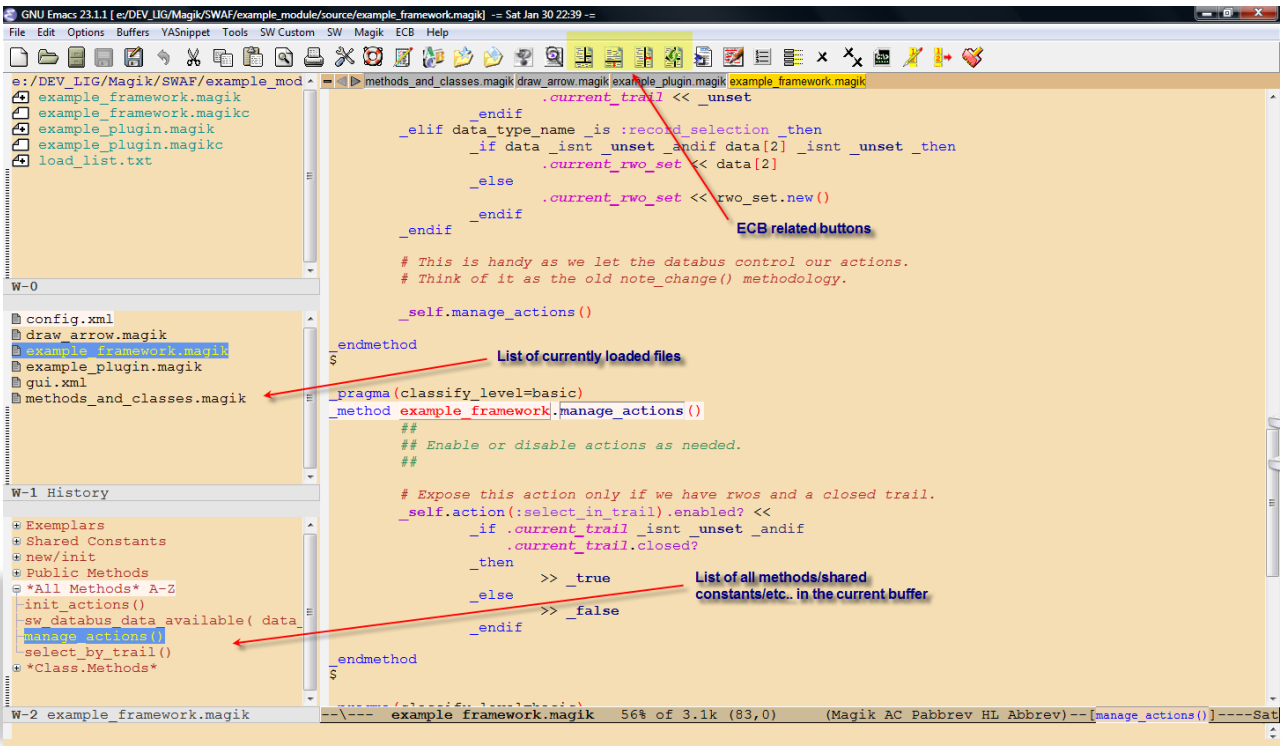


Class Browser F3-j / F3-b – allows you to go back in the File Navigation history, so you are able to return to the point in a code where you came from during your F3-j key journey.

TEMP.magik by F4-m / F12-m – copy current magik method to the Work (**Temp**.magik) buffer. Very helpful while making temporary changes in the code or just testing/debugging.

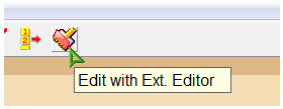
- F2-b – to compile message files <*.msg> directly from Emacs.

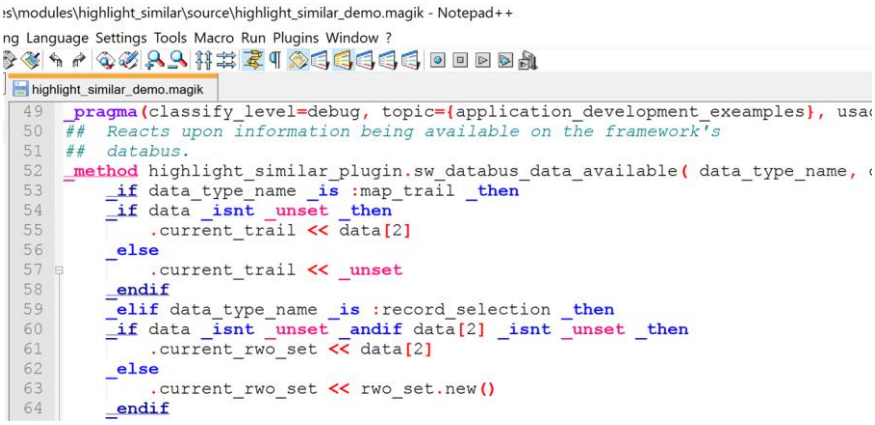
ECB – Emacs Code Browser which displays a number of informational windows that allow for easy source code navigation and overview.



Integration with an External Editor. This will allow you to load the file from the Emacs, if necessary, into an external editor of your choice to do some additional editing/searching or other file manipulations.

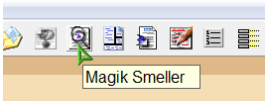
*Use "C:\Emacs293**NP++Magik_Language.XML**" to import Magik highlighting into Notepad++*

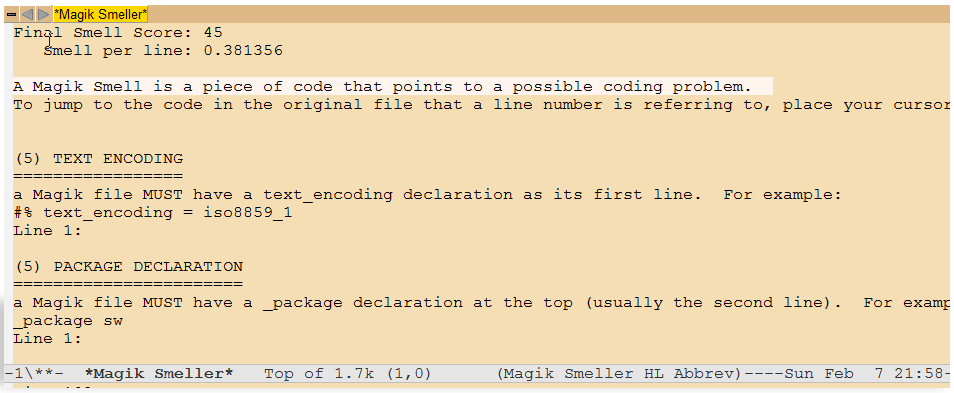




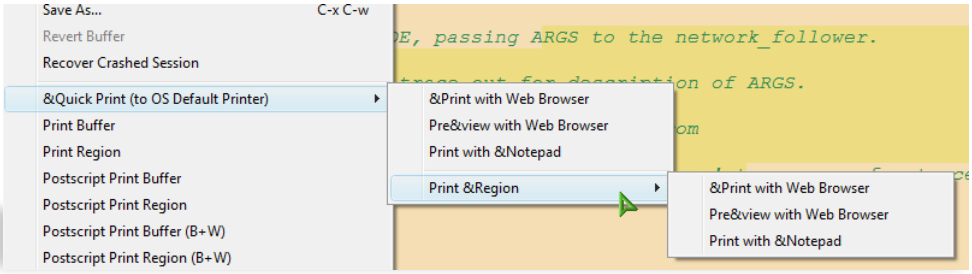
Magik Smeller, which helps you to find possible problems in the code. A tool to interactively report actual or possible code syntax problems that are acceptable to the Magik compiler but do not meet development standards or may be considered inefficient.

A new buffer called ***Magik Smeller*** will appear showing a list of all possible code "smells", their line number in the Magik file and a short description. To jump back to a line of code that has been reported as a smell, place your cursor on that line in the ***Magik Smeller*** and press "**F3-j**".

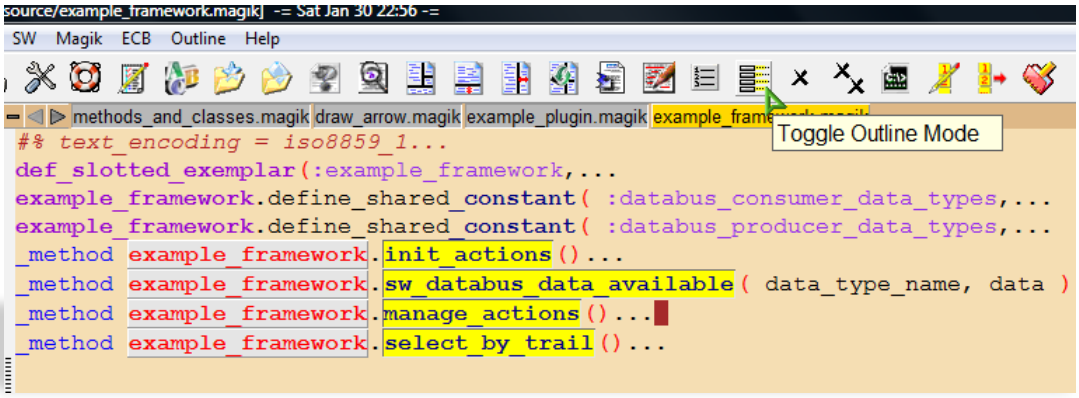




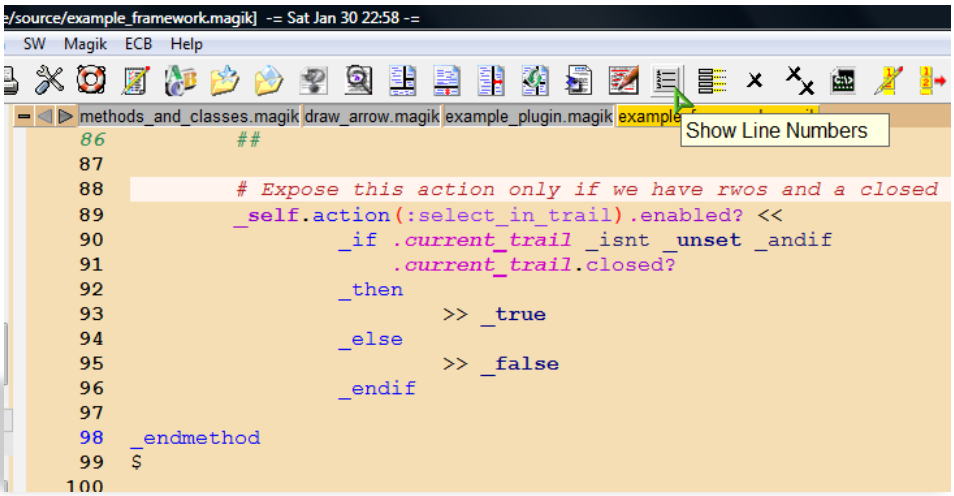
Print in colour or black&white directly from the Emacs. Preview in colour – will create an HTML page with current font locking highlights in the code.



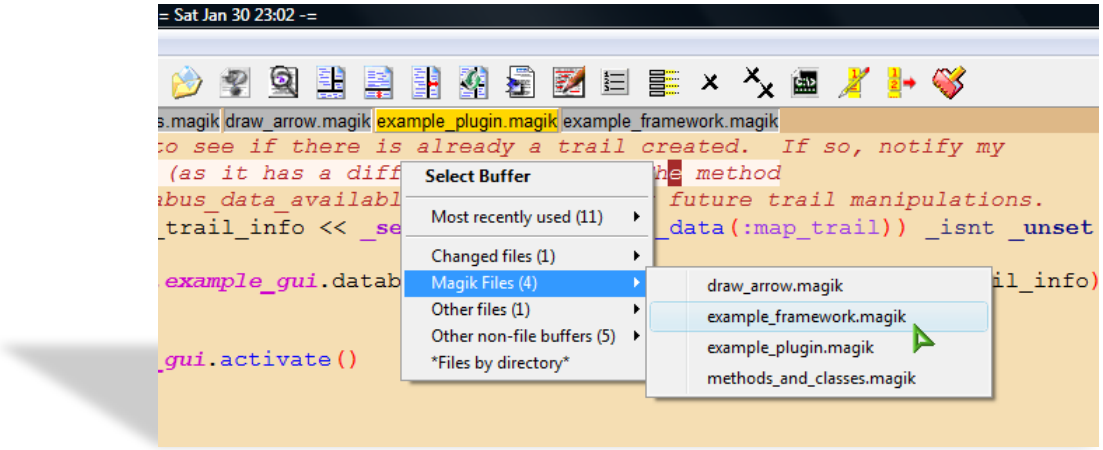
Outline mode for Magik files. Using keys F3+Up/Down in the Outline mode the Magik file can be collapsed to display only the method names and methods can be unfolded one by one for editing.



Show/hide Line numbers in a buffer.



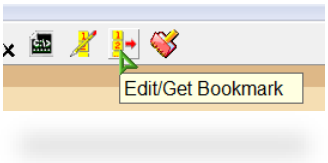
- Buffer selection- <Ctrl>+<left mouse button> will bring up the floating menu at the cursor position OR use <Ctrl>+<Tab> to navigate between tabs in the Tab-bar.



- Save all file backups (*.magik~) in the single configurable directory (system %TEMP% – by default).

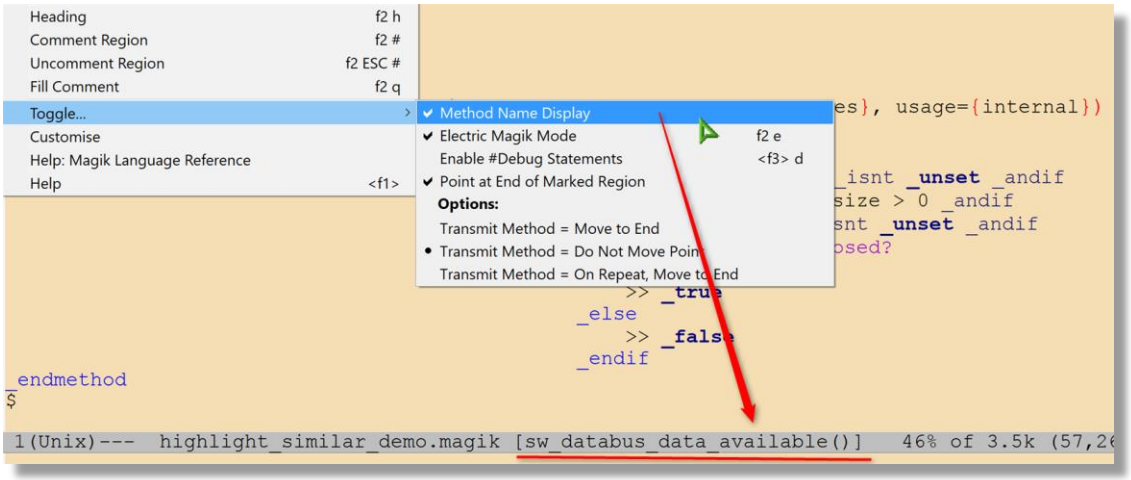
Use 'breadcrumbs' <F5-Spc> - to set series of Breadcrumb Bookmarks with quick cycling through them using <F5-Up/Down/Left/Right>.

Visual Bookmarks – use toolbar buttons to Set and Navigate between bokmarks

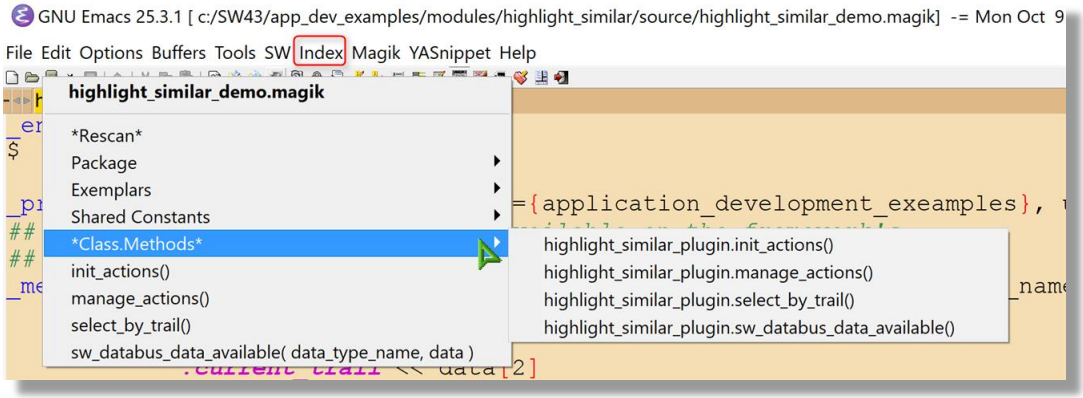


Or simply click on the left fringe to set/remove a bookmark

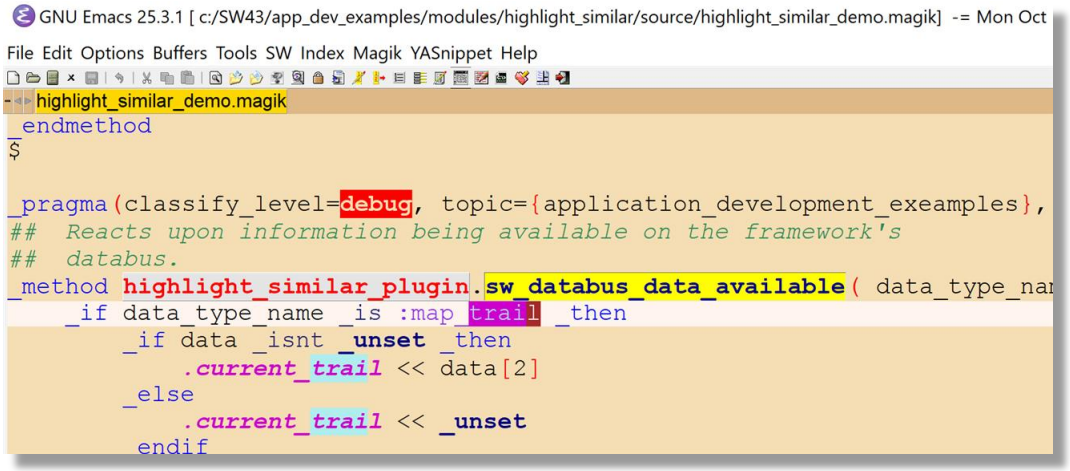
Current Method name in the mode line can be toggled from the [Magik] menu

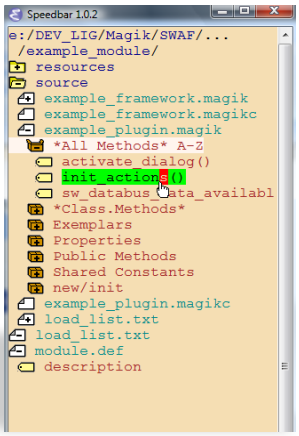


[Index] menu allowing quickly navigate between methods or use <Ctrl+RightClick>



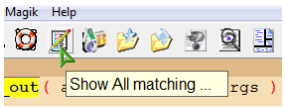
Additional highlighting during the incremental search

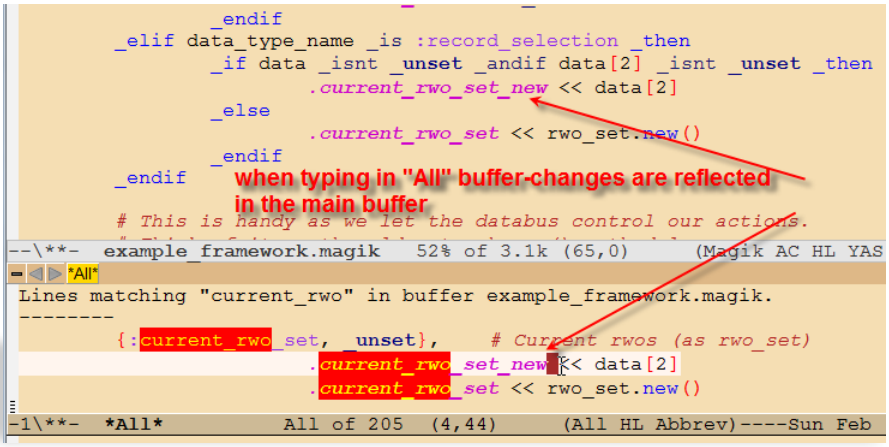




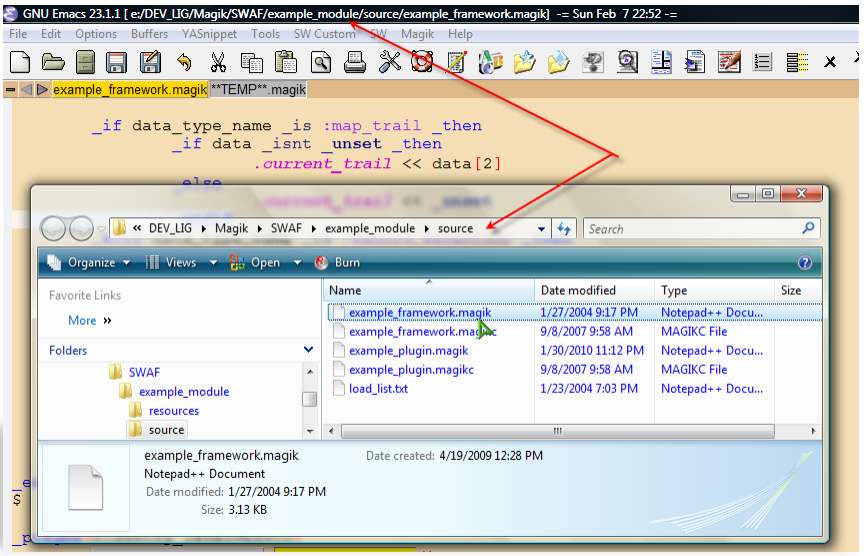
Speedbar (F11) - a special skinny frame with a specialized directory listing in it. This listing will have both directories and filtered files in it. You can then load files into your Emacs buffer, or expand the files to display all the methods/progs/constants/…. in them and jump to those tags. You can also expand multiple directories into your Speedbar frame.

- Use **'Alt-x all <Enter>'** or the icon to list\EDIT all lines matching a given regexp in *All* buffer. ***Changes made in the *All* buffer is propagated to the original buffer.*** Use **'F3-j'** from *All* buffer to go to a match in the original file. **Note that changes to the `*All*' buffer are propagated back to the original buffer.**

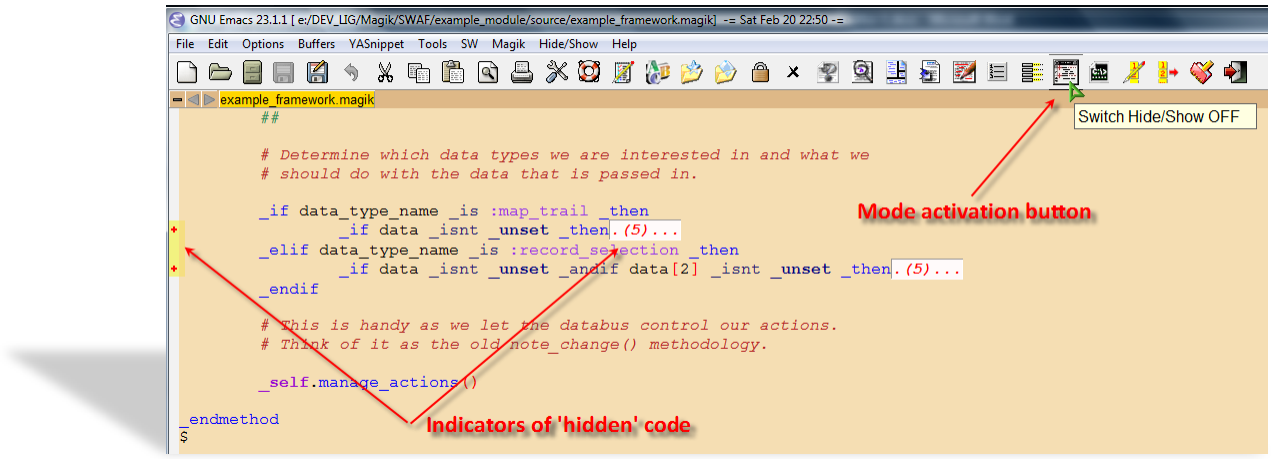




- While you have a file loaded into the Emacs buffer pressing <F12-F12> will open Windows Explorer in the directory of the current file.



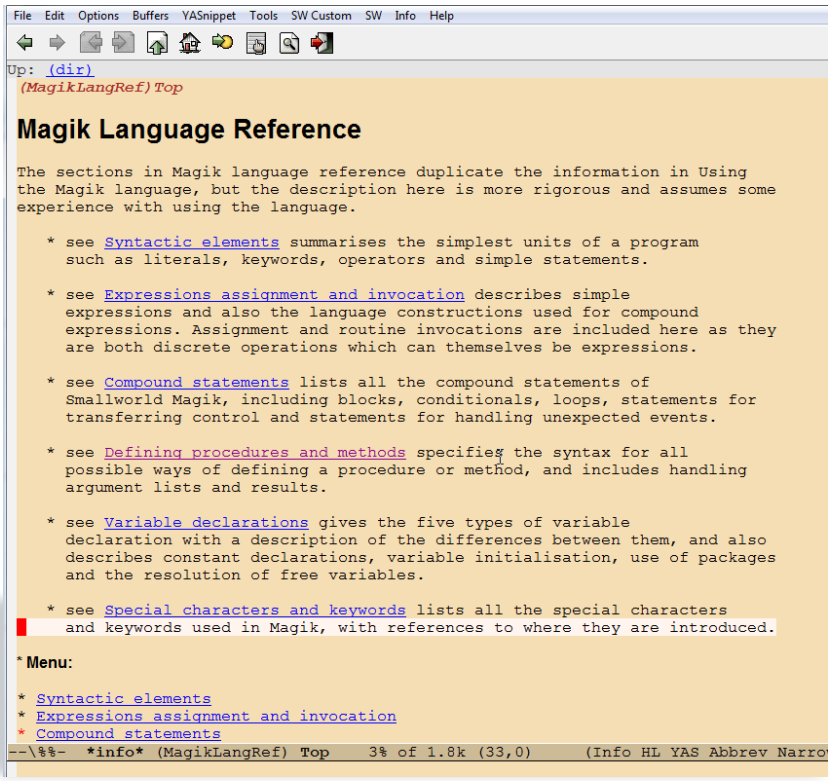
Magik code folding – where large blocks of code can be distracting. With the code folding feature you can hide the code not important to your current work. Code folding cleans your workspace. Use <Ctrl-.> key to hide the block of code while your cursor is inside the desired block.



- Use <Ctrl-,> key to hide/show code on the 'method' level

Magik Language Reference

available within Emacs.



- Use %USER_EMACS% environment variable in gis_aliases to load your local Emacs settings, like

  (setq programmer-tag "User Name, Company Name")

  (setq project-name "Project Name")

  (setq programmer-time-stamp-format "%:y-%02m-%02d"); %02H:%02M:%02S")

- [Alt-n] to insert-programmer-note;

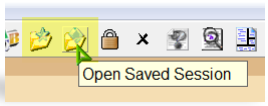
  [Alt-m] to insert-programmer-modified-note;

[Alt-c] to insert-change-note around selected block – just select the block of code and press <Alt-c> and note change comments will be placed around the selected code;
OR just use this to create a note change.

```
# START CHANGE
# (2010-02-20 Igor Lapitski, Hyde Park) :
# Push it out to the owning framework databus so that the Application Framework can
# respond to.
_self.framework.databus.make_data_available(:geometry_to_highlight,
                                            geom_set)
#
# END CHANGE
```

[Alt-h] to insert-method-comment;

Save/Restore Emacs Sessions. That allows you to organize your different projects into "sessions". Each Session has a name (file name). When you 'Save Session', the list of all opened files is saved into the current session and all the files you were editing will be reloaded the next time you 'Restore Session'. This allows you to keep different files open in different Emacs sessions. By using 'Save/Restore Session' you are activating 'Session auto-saving mechanism' - on Emacs exit current Session will be saved automatically.

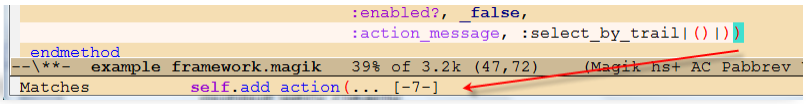


- To make prominent marks in '*gis*' buffer or comments in 'Magik' buffer use '@' at the beginning of the line in '*gis*' buffer and '#@' in 'Magik' buffer. I found this useful when you have a lots of output in the *gis* buffer and you need to see specific line – just use this in your code *write("@Important info: ", a_variable)* and you will be able to see this line in the output very clearly.

```
# Determine which data types we are interested in
# should do with the data that is passed in.

#@ This is the comment that I want to see
#@ Review
_if data_type_name _is :map_trail _then
        _if data _isnt _unset _then
                .current_trail << data[2]
        _else
                .current_trail << _unset
```

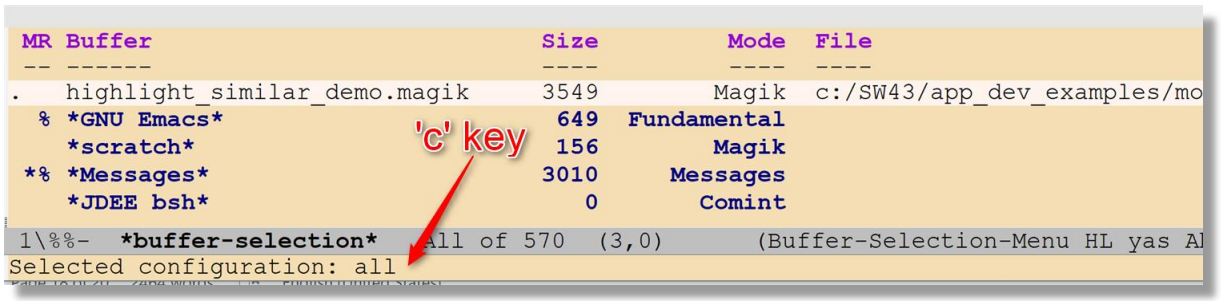
- Use F2-b to send <*.msg> file to running GIS buffer. This will load current *.msg file into an open currently image.

- Emacs will display highlighting on whatever parenthesis matches the one before or after point. See message in Mini-buffer describing the match when the matching parenthesis is off-screen. Message contains the line number.



- Use 'Ctrl-TAB' to switch\cycling between Emacs buffers.

- When using <Ctrl-x/Ctrl-b> to bring up Buffer Selection Menu – use following keys : <c> - to change the configuration; <s> - to save buffers marked with '*' ; <d> - to delete buffer



List of key-bindings which might be useful in everyday Emacs operations with Smallworld environment:

<f2> TAB	hippie-expand
<f2> RET	magik-transmit-thing
<f2> ESC	Prefix Command
<f2> #	magik-comment-region
<f2> X	dev-tools-object-inspector
<f2> [	toggle-debug
<f2> b	magik-transmit-buffer
<f2> e	electric-magik-mode
<f2> g	gis
<f2> k	sw-reload-dotemacs
<f2> m	magik-transmit-method
<f2> q	fill-magik-public-comment
<f2> r	magik-transmit-region
<f2> s	gis-version-selection
<f2> t	add-trace-statement above
<f3> t	addtrace-statement below
<f2> x	deep-print variable
<f2> z	gis
<f2> <f1>	sw-help-keys
<f2> <f7>	magik-transmit-method
<f2> <f8>	magik-transmit-region
<C-S> d	duplicate current line
<C-M> <up/down>	move current line

<f3> /	cb-and-clear
<f3> ?	cb-help
<f3> b	cb-jump-back
<f3> c	cb-paste-class
<f3> d	toggle-transmit-magik-debug
<f3> j	cb-jump-to-source
<f3> m	cb-paste-method
<f3> <f3>	cb
<f4> c	magik-copy-method
<f4> d	dev-tools-debug-method
<f4> e	magik-ediff-methods
<f4> m	magik-copy-method-to-buffer
<f4> n	magik-set-work-buffer-name
<f4> o	dev-tools-object-inspector
<f4> r	magik-copy-region-to-buffer
<f4> s	magik-add-debug-statement
<f4> w	magik-compare-methods
<f4> <f4>	magik-symbol-complete
<f4> b	bury-buffer
<f4> g	goto-line
<f5> g	goto-line
<f6>	magik-copy-method
<f7>	magik-transmit-method
<f8>	magik-transmit-region
<f9>	magik-mark-method

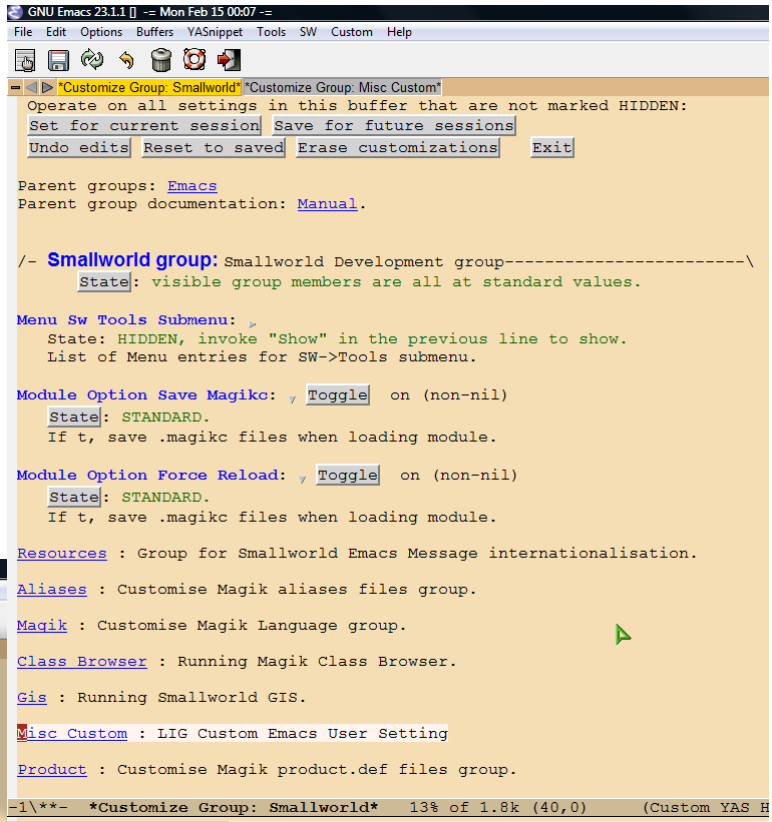
BOOKMARKS / BREADCRUMPS	
<C-f5>	toggle visual boormark
<f5-Spc>	set breadcrumb bookmark
<f5> <delete>	bc-goto-current
<f5> <down>	bc-local-next
<f5> <left>	bc-previous
<f5> <return>	bc-list
<f5> <right>	bc-next
<f5> <up>	bc-local-previous
<f5> a	bm-toggle-cycle-all-buffers
<f5> d	bookmark-delete
<f5> e	edit-bookmarks
<f5> l	bookmark-load
<f5> n	bm-next
<f5> p	bm-previous
<f5> s	bookmark-set
<f5> w	bookmark-write

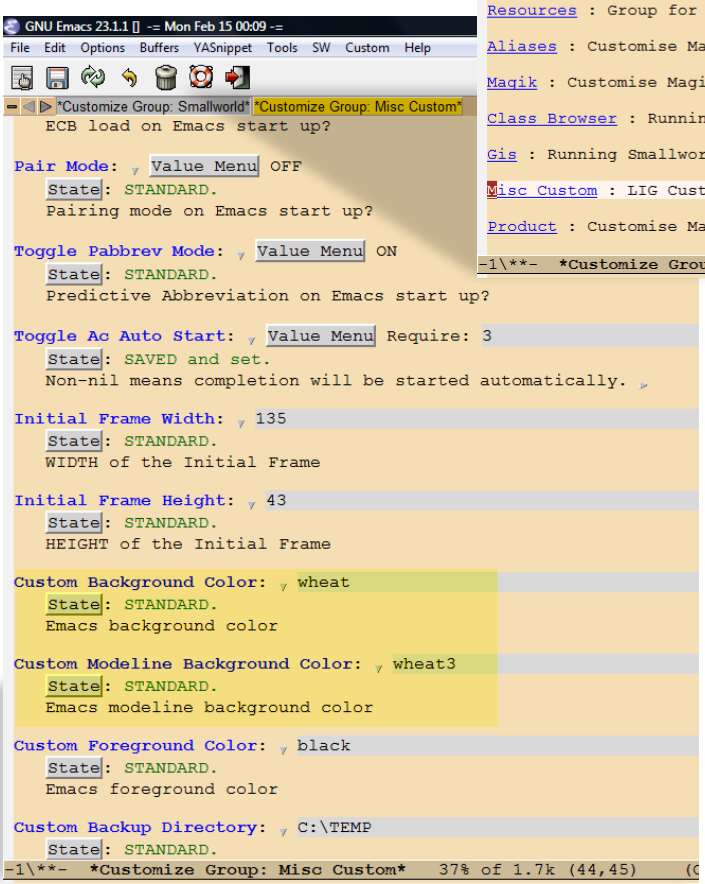
<f11>	speedbar-get-focus
<f12> -	ecb-cycle-ecb-buffers
<f12> =	ecb-maximize-window-methods
<f12> b	ecb-minor-mode
<f12> c	ecb-toggle-compile-window
<f12> e	send-file-to-external-editor
<f12> h	ecb-toggle-compile-window
<f12> q	ecb-redraw-layout
<f12> r	ecb-restore-window-sizes
<f12> t	ecb-toggle-layout
<f12> u	ecb-rebuild-methods-buffer
<f12> w	ecb-toggle-ecb-windows
<M-/>	dabbrev-expand
<M-d>	close window
<M-b>	move cursor to another buffer
<M-f>	move cursor to another frame
<M-m>	insert-modified-note

<f12> <f12>	w32shell-explorer-here	<M-n>	insert-programmer-note
<f12> m	magik-copy-method-to-buffer	<M-c>	insert-change-note
<f12> n	highlight-next-change	<M-h>	insert-method-comment
<f12> p	highlight-previous-change	<C-Tab>	toggle between files
<f12> e	send-file-to-external-editor		

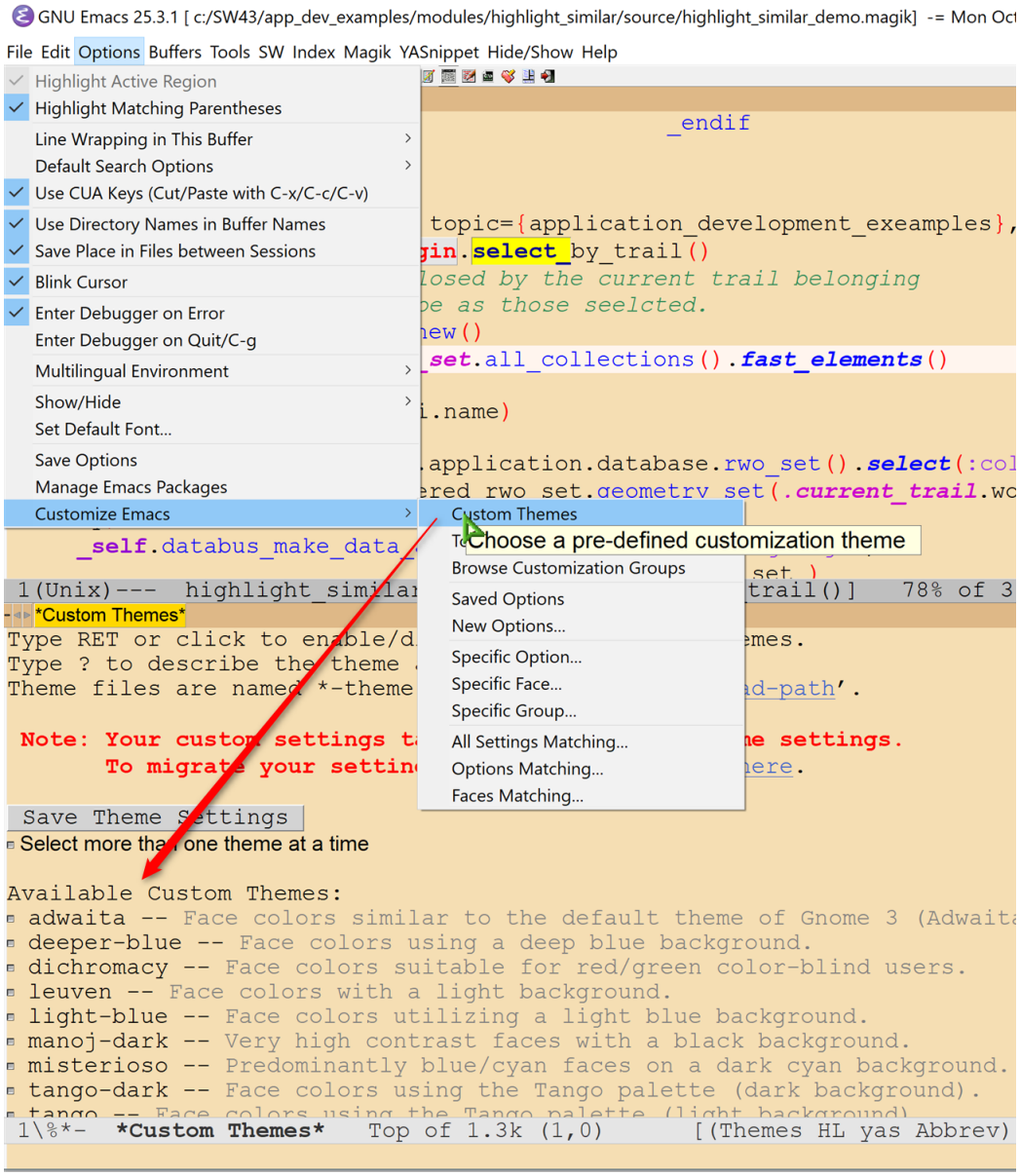
Many of those settings are possible to customise, use the menu SW->Customose->Customise Smallworld Emacs.

The background colour of the custom version of the Emacs (wheat) also possible to change. All custom settings will be saved in the <.emacs-custom> file in your %HOME% directory. See http://www.hydepark-consulting.com/Emacs/ *Emacs_colours.pdf* for all possible colours.

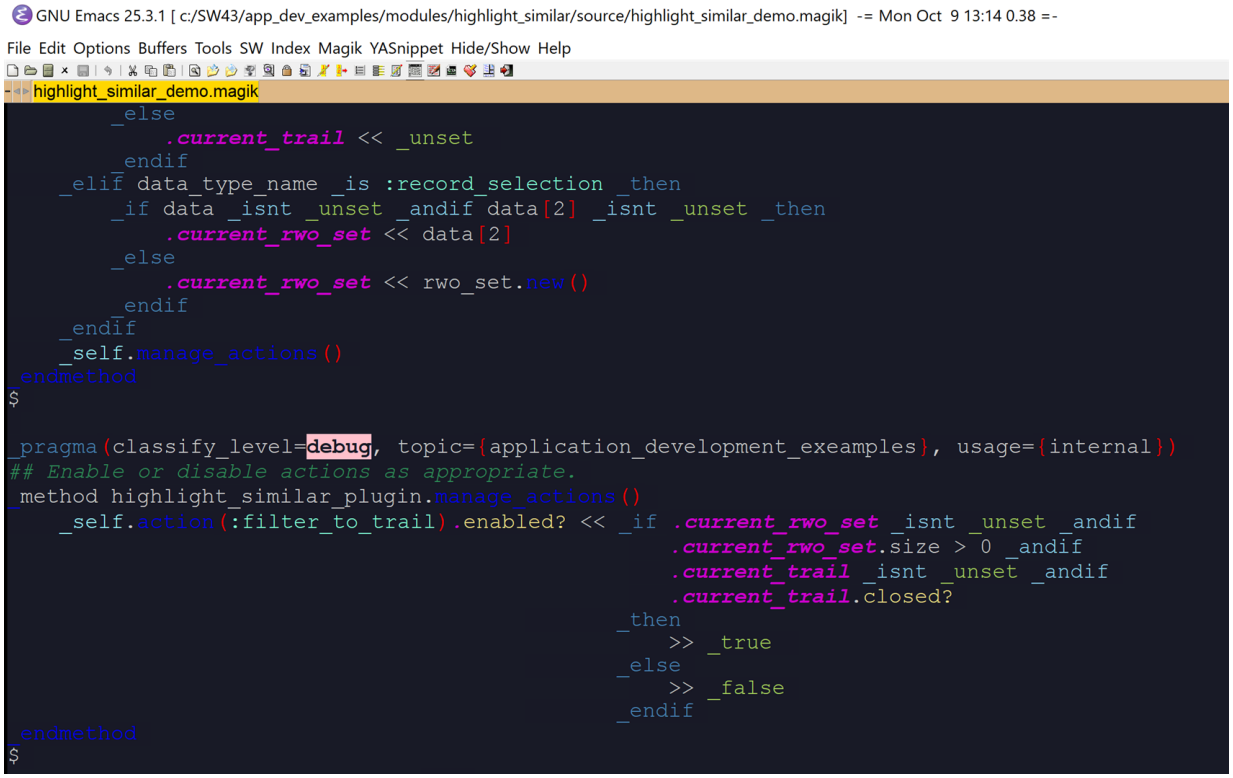




- There are several predefined Custom colour Themes for Emacs



Use them based on your own taste:



Key bindings for Magik mode

Several of these commands interact with a Smallworld session. If there is a current Gis buffer, or only one Gis buffer, then the corresponding Smallworld session is used; otherwise, you are prompted for the required Gis buffer.

Commands which provide an interface to the Development Tools application are only applicable when this application is available in the relevant Smallworld session. The application is loaded and started if necessary; any errors are reported to the relevant Gis buffer.

F2, B	Transmit the buffer to a Smallworld session.
F2, R or	Transmit the current region to a Smallworld session.
F2, F8 or F8	
F2, M or	Transmit the method which contains the cursor position to a
F2, F7 or F7	Smallworld session.
F2, Enter	Transmit the top-level Magik language construction surrounding the point in the current buffer, such as a method or procedure definition, to a Smallworld session.
F2, $	Transmit the chunk of Magik code, delimited by $ lines, and containing the cursor position, to a Smallworld session.
F4, F4	For a running Smallworld session, finds the symbol that starts with the current word, or lists all the available completions.
F4, O or	Inspect a Magik object. Prompts for an expression which is
F2, Shift+X	evaluated within a Smallworld session to return the object to
F2, X	inspect; the word at the cursor position is available as a default.
F4, O and F2, Shift+X	display the object in an Object Inspector from the Development Tools application.
F2, X	displays the object in an Emacs Deep Print buffer.
F4, D	Send a method to a Magik Debugger from the Development Tools application in a Smallworld session.
F2, Spacebar	Insert the Magik template for the preceding text
F2, #	Add a leading # to each line in the region to convert them to comments.
F2, Esc, #	Remove a leading # from each line in the region.
F2, Q	Fill comment line. Formats the current line into separate comment lines, adding leading indentation and # or ## to match the initial line.
F2, H	Format the current line as a comment heading.
F2, T	Add a trace statement above current line. When executed, the text of the current line is output.
F3, T	Add a trace statement below current line. When executed, the text of the current line is output.
F4, S	Add a Debug statement; a toggle is available so that Debug statements can be transmitted as comments or as executable commands.
F4, R	Copy the current region to a work buffer.
F4, M	Copy the current method to a work buffer.
F4, N	Open a work buffer and give it a name.
Ctrl+M+H or F9	Mark the current method.
F4, C or F6	Copy the current method.
F4, W	Compare methods using standard Emacs facilities.
F4, E	interfaces to the Emacs command compare-windows.

Key bindings for other modes

Some key bindings are available for the other Smallworld major modes.

Aliases mode

Ctrl+C	Run command definition. In the Aliases buffer, finds the command definition which contains the cursor position and uses the launcher program to run it; otherwise prompts for the required definition.

Environment mode

A buffer in Environment mode is readonly so alphanumeric keys are used as shortcuts for commands.

Enter	Select the Smallworld Core product indicated by the cursor middle-clickposition; this product installation defines the environment for any new Smallworld sessions.
Spacebar	Move the cursor to the next product installation in the buffer.
R	Run the Gis command in the environment defined by the cursor position. Does not change the environment for any other sessions.
+	Add a new product installation; prompts for the Smallworld Core product location, and a name and version for the installation. Only available if a version file is in use.
Q	Quit; closes the buffer without making any change to the environment.

Loadlist mode

F2, B	Transmit buffer. Uses the load list to load Magik files into a current Smallworld session; prompts for the required Gis process if there is more than one.
F2, C	Toggle to control whether compiled Magikc files are saved.
Ctrl+C, R	Refresh buffer. Uses the current contents of the directory containing the load list file to update the contents of the buffer. You can change the order of entries and save a new load list file if required.

Message mode

F2, B	Transmit buffer. Compiles the buffer contents and loads into a current Smallworld session; prompts for the required Gis process if there is more than one.
F2, C	Compile message file. Compiles the buffer contents ready for loading, but does not load it.
F2, Up Arrow F2, Down Arrow	Move the cursor to the previous or next message.
F2, M	Mark message.

Module mode

F2, B	Transmit buffer. Uses the buffer contents to load all module source files and all compiled message files into a current Smallworld session; prompts for the required Gis process if there is more than one.
F2, D	Reload module definition. Loads the buffer contents into a current Smallworld session; does not load module source files or resources.
F2, C	Compile message files. Compiles all message files for the module ready for loading.
F2, Shift+R	Remove module definition from a current Smallworld session. This is sometimes required to ensure the correct functionality is included in the session.
F2, S	Toggle the option to save compiled Magikc files when loading module source files.
F2, R	Toggle the option to force reloading of a module which is already loaded.

Product mode

F2, B Transmit buffer. Uses the buffer contents to add the product to a current Smallworld session; prompts for the required Gis process if there is more than one.

F2, R Reinitialise product. Uses the buffer contents to redefine the product in a current Smallworld session where the product is already defined.