Introduction to Cognitive Robotics

Module 8: An Introduction to Functional Programming with Lisp

Lecture 4: Emacs

David Vernon
Carnegie Mellon University Africa

www.vernon.eu

Beginners Guide to Emacs

Based on Jessica Hamrick's Absolute Beginners Guide to Emacs
http://www.jesshamrick.com/2012/09/10/absolute-beginners-guide-to-emacs/

Before we begin ...

Emacs is old-school software, but it is extremely powerful

- Older than the mouse
- Older than current keyboard shortcuts for cut and paste such as ctrl-c and ctrl-v
- Older than you, probably

But watching the speed with which an Emacs master edits text will take your breath away

Before we begin ...

Learning to use Emacs can be bewildering at first, even infuriating, but ...

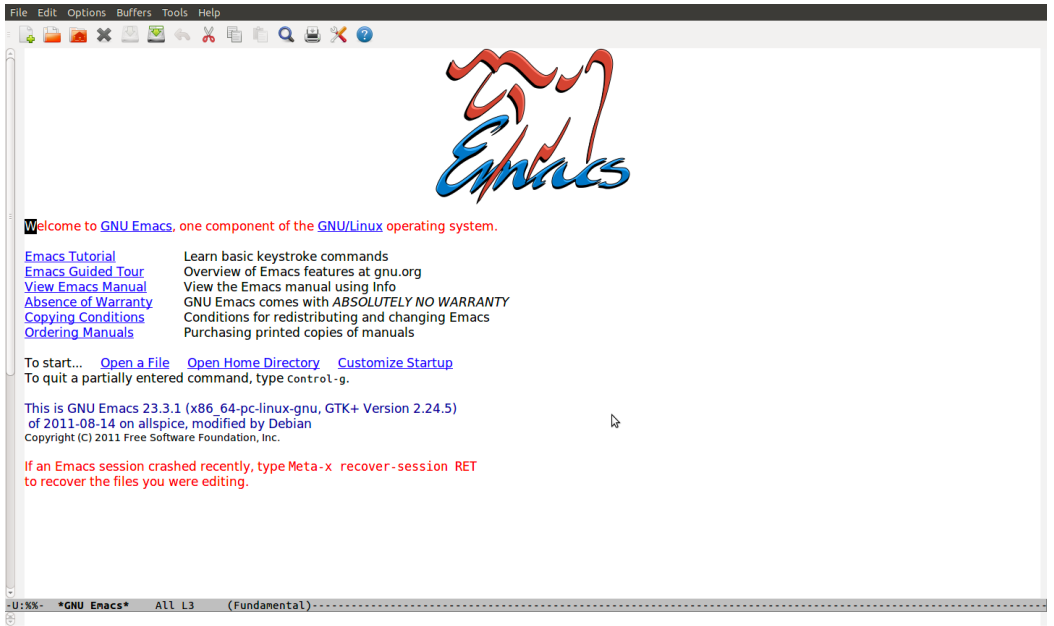
- Practice the key-strokes
- Embed them in muscle memory
- Avoid the mouse

and, eventually, it will become second–nature and your speed at editing will increase dramatically

Opening Emacs

When you first open Emacs, you will see a window like this

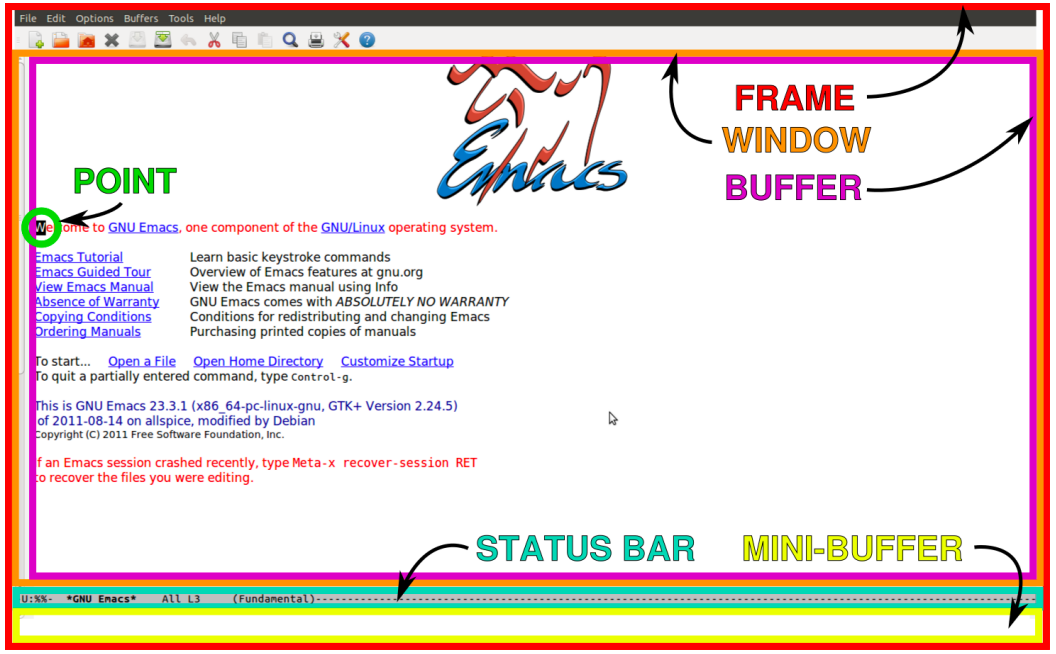
- Try not to rely on the menu bar at the top
- Learn to use the keyboard shortcuts



Credit: Jessica Hamrick http://www.jesshamrick.com/2012/09/10/absolute-beginners-guide-to-emacs/

Opening Emacs

Emacs refers to a frame, window, buffer, point, status bar, and mini-buffer



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Opening Emacs

Frame	this is what you would normally refer to as a window
Window	this is effectively a view; there can be many windows
Buffer	this the text that is being edited; there can be many buffers
Point	this is where the cursor is; it can also refer to a region of text
Status bar	displays information about the point and the active buffer
Mini-buffer	will occasionally display status messages you also enter Emacs commands here

Keyboard Shortcuts

There are two very important keys in Emacs;
both are used in combination with other keys

1. The "Ctrl" key
   - Usually written as just "C"
   - Combinations are written "C-<key>"
   - e.g. C-f means the "ctrl key f key" combination

2. The "Meta" key ("Alt" or possibly the Windows key)
   - Usually written as just "M"
   - Combinations are written "M-<key>"
   - e.g. M-x means the "meta key x key" combination

Keyboard Shortcuts

The four most important keyboard shortcuts to know are

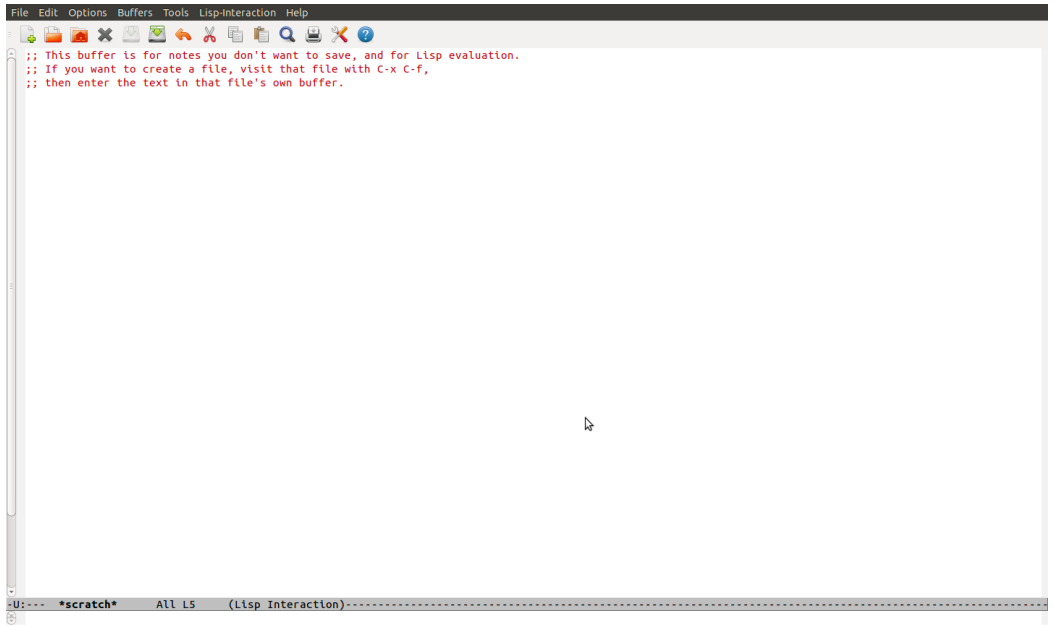
C-h C-h	help
M-x	run command e.g. M-x ielm runs the Emacs equivalent of the Lisp REPL loop
C-g	quit, i.e. cancel an operation e.g. if you have entered a command in the mini-buffer
C-x C-c	exit Emacs

Buffers and Windows

- You can have many buffers open at once
  - Usually they display the contents of a file
  - They can also display output from programs or other information
- By default, Emacs creates a single window and displays the *GNU Emacs* buffer in it
- It also always opens up a *Messages* buffer to display information and error messages about Emacs itself
- There is also always a *scratch* buffer for notes or other text you don't want to save.

Buffers and Windows

There is also always a *scratch* buffer for notes or other text you don't want to save.



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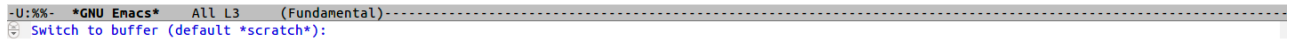
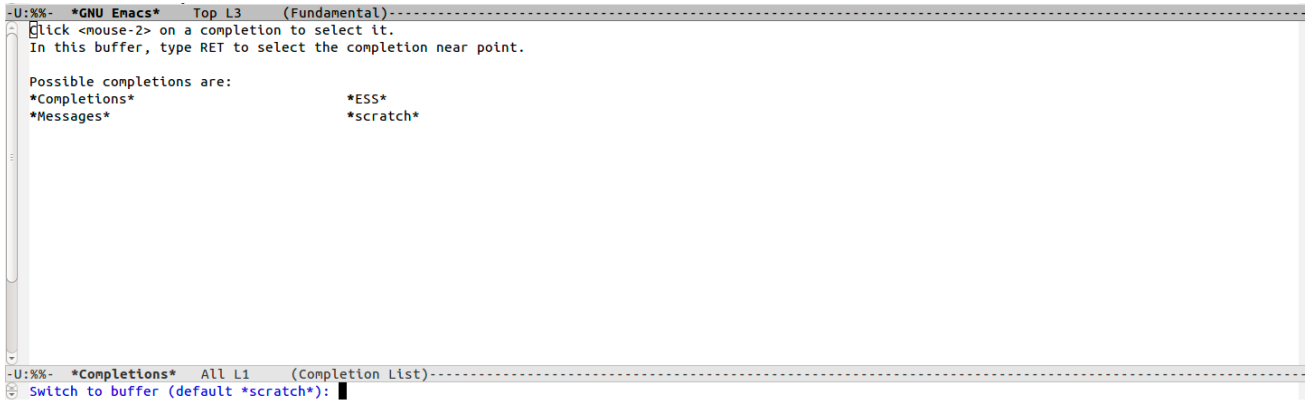
Buffers and Windows

- You can't see the other buffers until you tell Emacs to view them through a window
- To do this, use the C-x b key combination
  - This will move the point to the mini-buffer and display a message that looks like "Switch to buffer (default *scratch*)"



Buffers and Windows

- Press the tab key from the mini-buffer prompt to see which buffers are open



- When typing the name of the buffer, tab will complete it for you

- Use C-g if you want to cancel this command

Buffers and Windows

You can also cycle through buffers sequentially with the key combinations

C-x <left arrow>

C-x <right arrow>

Buffers and Windows

Windows are just views into a buffer

- You can open up multiple windows in the same frame
- You can have multiple windows displaying the same buffer

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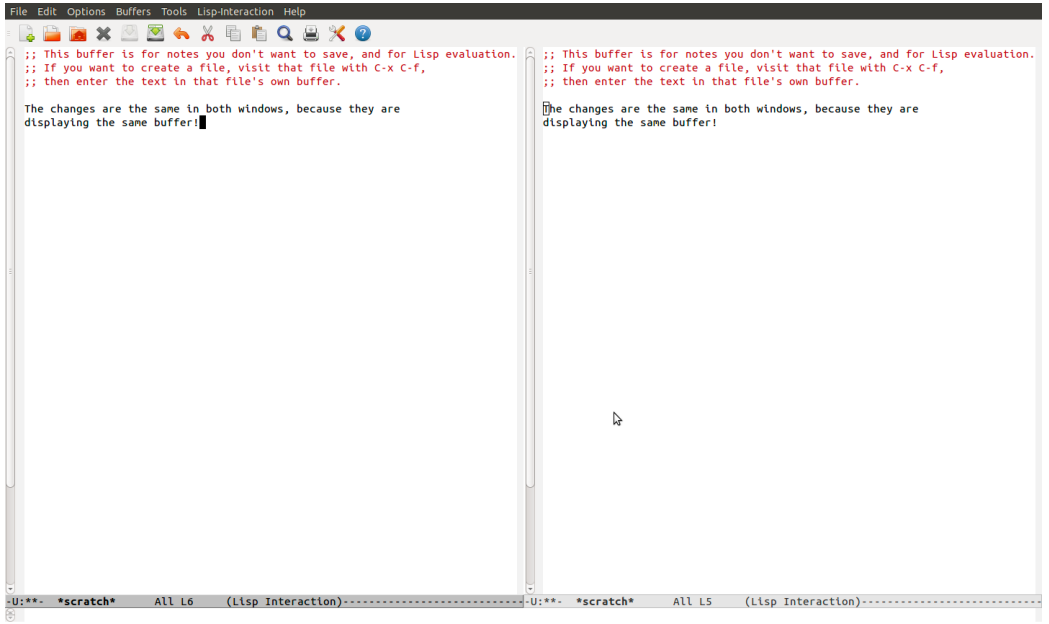
Buffers and Windows

If you edit the buffer in the left window, the changes will be reflected in the right window, because the are both displaying the same buffer



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Buffers and Windows

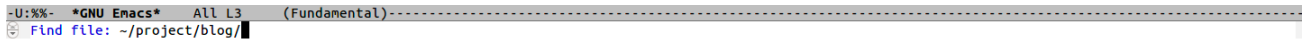
C-x 0	close the active window
C-x 1	close all windows except the active window
C-x 2	split the active window vertically into two horizontal windows
C-x 3	split the active window horizontally into two vertical windows
C-x o	change active window to next window

Closing a window does not mean that the buffer it is displaying is closed

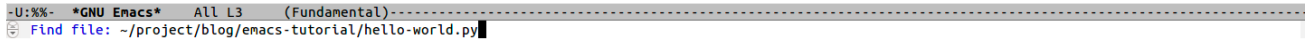
Opening, saving, and closing buffers

To open a file and load it into a buffer, use C-x C-f

- This will open a prompt in the mini-buffer that says "Find file: ~/path/to/current/directory".



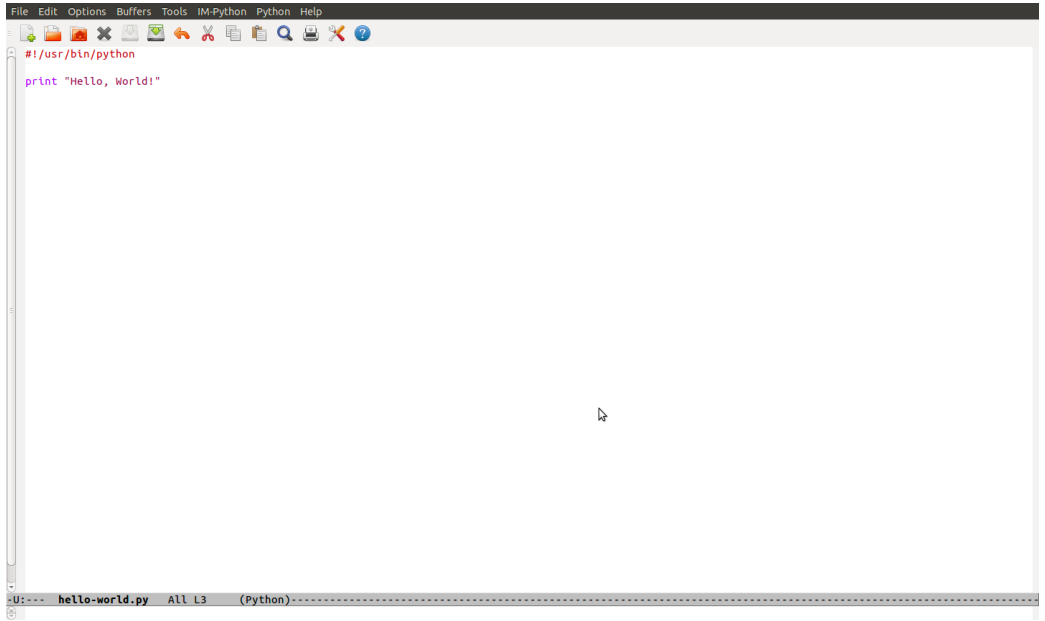
- You can then type in the name (and/or change the path) of the file you want:



Opening, saving, and closing buffers

To open a file and load it into a buffer, use C-x C-f

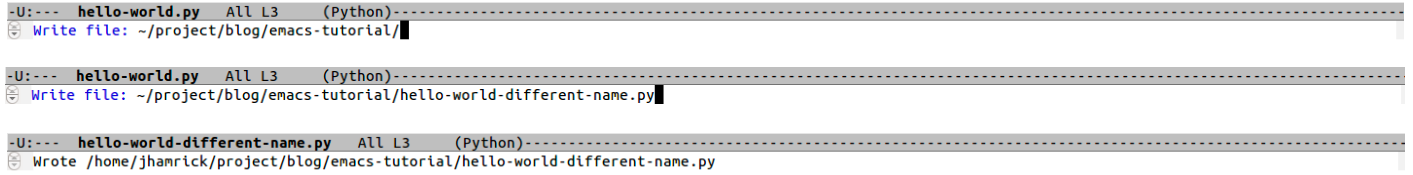
Press enter, and a new buffer will be created with the file you specified



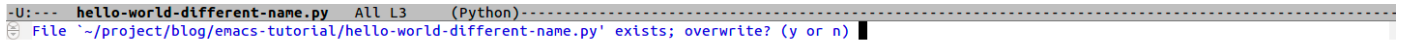
Opening, saving, and closing buffers

- If you make changes to the buffer and you want to save it back to the file on disk, use C-x C-s

- If you want to save the buffer under a new file name ("Save As"), use C-x C-w, which will prompt you to specify the file name:



- If the file already exists, it will double check to see whether you are actually intending to overwrite the existing file:



Opening, saving, and closing buffers

Once you are done with the buffer and want to actually close/kill it, use C-x k

- which will prompt you in the mini-buffer for the name of the buffer to kill (similar to the prompt given when switching buffers)

- If you don't specify a buffer, it will kill the active buffer by default.

Manipulating text

- Emacs has functions similar to the “cut”, “copy”, and “paste”
- However, Emacs uses different names:

  kill operation is analogous to “cut”

  yank is analogous to “paste”

- They are more sophisticated than cut and paste in that they manipulate multiple generations of cut and paste text

Manipulating text

- To select the region, move the point to one end and hit C-space
- You will see a message in the mini-buffer: "Mark set"
- Now move the point to the other end of the region;
  this highlights the region

C-w	kills the region
C-y	yanks the region
M-w	kills the region without deleting it
C-_	is how to undo the operation

Manipulating text

- Emacs has what is known as a kill ring

- This is a structure that keeps multiple instances (generations) of text that has been killed

  C-y yanks the more recently killed region

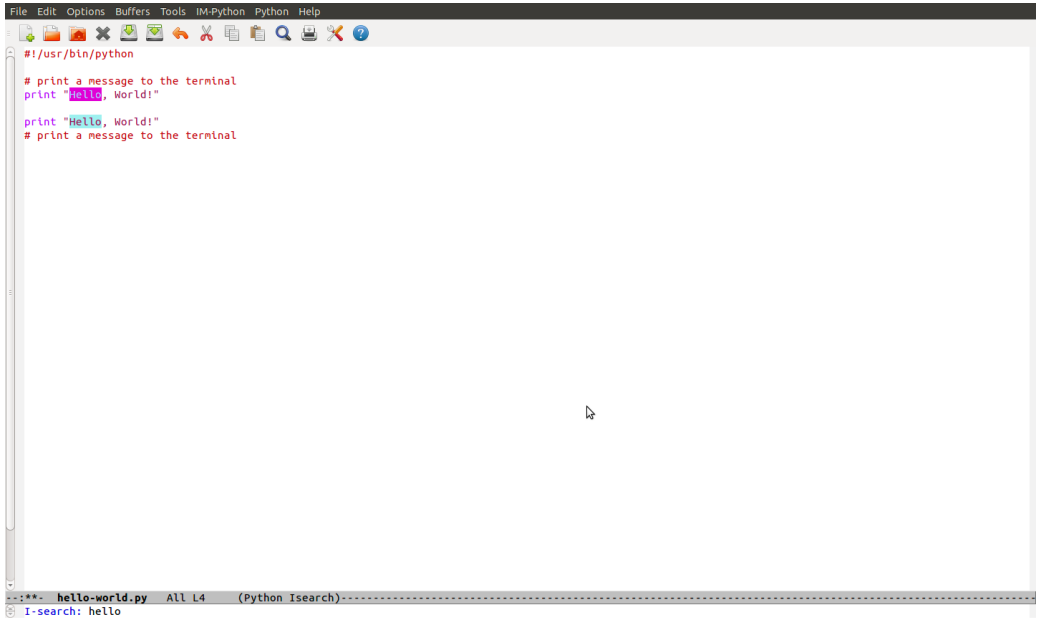
  If, without moving the point, you then do M-y, the region killed before that is yanked, replacing the region just yanked

  Repeating M-y yanks successively older generations of killed regions

Manipulating text

Search

When you reach the end of the search results, Emacs will display a “Failing I-search” message the mini-buffer



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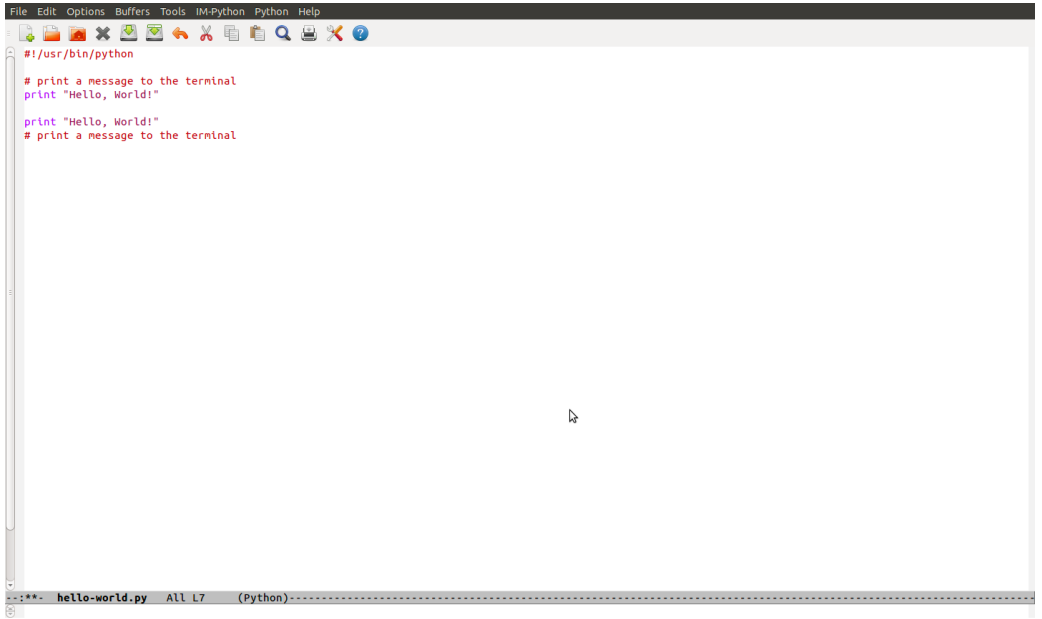
Manipulating text

Find and replace

Let's replace Hello with Goodbye



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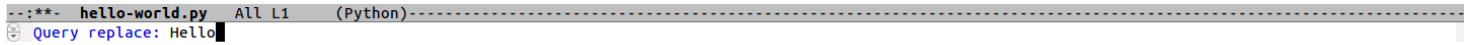
Manipulating text

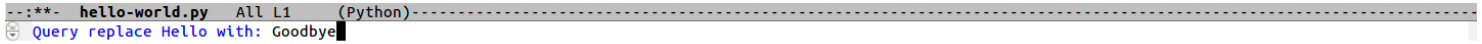
Find and replace

M-% and then enter the text you want to find



Then press enter

and enter the text you want to replace it with



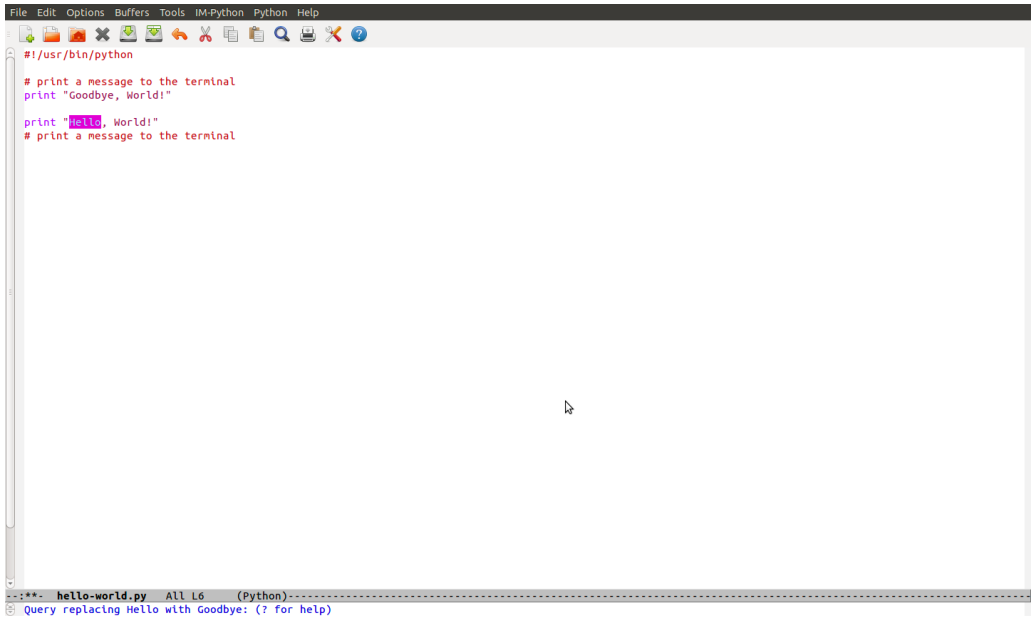
Emacs will highlight the text to be replaced

Manipulating text

Find and replace

Press ‘space’ to replace it or ‘n’ to skip it and go to the next one.

Press ‘!’ to replace all queries.



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Exercise

Go through the built-in Emac tutorial.

Here are three ways to start the tutorial:

1. Click the words Emacs Tutorial on the default screen that comes up when you start Emacs

2. Use the menu to select Help → Emacs Tutorial

3. Type C-h t
   (type ctrl-h, then release ctrl-h and type the character t)

The tutorial takes most people about an 60-90 minutes to complete

It may be boring, but it is worth it, so persevere

Recommended Reading

Jessica Hamrick's *The Absolute Beginners Guide to Emacs*

http://www.jesshamrick.com/2012/09/10/absolute-beginners-guide-to-emacs/

A Guided Tour of Emacs

https://www.gnu.org/software/emacs/tour/index.html

GNU Emacs Reference Card

https://www.gnu.org/software/emacs/refcards/pdf/refcard.pdf

GNU Emacs Survival Card:

https://www.gnu.org/software/emacs/refcards/pdf/survival.pdf