

Please complete the following questions. If you need help, feel free to ask questions both from other students and from me. If you cannot finish during the class time then you should finish this lab at home. After you finish, feel free to clean up (*i.e.*, remove) any files or directories that were created, you won't need them in the future. But be careful not to remove any other important files you may have in your home directory.

In these exercises, you should use the keyboard only and not the mouse.

1. Preliminary.

- (a) Change your location to the 'cse399' directory you created in previous homeworks or labs (create it again if you deleted it). Copy the directory /home1/m/mcorliss/teaching/cse399/lab4 and all its subcontents to your current location. Change your location to this new directory (lab4).

2. File operations in *emacs*.

- (a) Open emacs in the shell window.

Answer:

```
bash$ emacs -nw
```

- (b) Open the file 'index.html'

Answer:

```
C-x C-f <return> index.html
```

- (c) Type the space bar. Then hit backspace to remove the space. Now save the file.

Answer:

```
C-x C-s
```

- (d) Save the file as 'index-2.html'.

Answer:

```
C-x C-w <return> index-2.html
```

- (e) Close emacs.

Answer:

```
C-x C-c
```

- (f) Open the file index.html in emacs, putting the process in the background.

Answer:

```
bash$ emacs index.html &
```

3. Moving around in *emacs*.

- (a) Go to the end of the document of 'index.html'. Then go back to the beginning of the document.

Answer:

End: M->, beginning: M-<

- (b) Scroll down a page at a time. Repeat this a few times, then scroll back up a page a time.

Answer:

Down: C-v, up: M-v

- (c) Go to the end of the line using one command, then go back to the beginning of the line using one command.

Answer:

End: C-e, beginning: C-a

- (d) Go forward, backward, up, and down a character at a time, but without using the arrow keys.

Answer:

Forward: C-f, backward: C-b, up: C-p, down: C-n

- (e) Go forward or backward one word at a time.

Answer:

Forward: M-f, backward: M-b

4. Buffer operations in *emacs*.

- (a) List all buffers.

Answer:

C-x C-b

- (b) Switch the current buffer to the scratch buffer.

Answer:

C-x b <return> *scratch*

- (c) Kill the scratch buffer

Answer:

C-x k

5. Window operations in *emacs*.

- (a) Make the current window the only displayed window (enter the command even if it currently is the only displayed window).

Answer:

C-x 1

- (b) Split into two windows with one window on the left and one on the right.

Answer:

C-x 3

(c) Move the cursor back and forth between the two windows.

Answer:
C-x o

(d) Split the right window into two smaller windows with one on top and one on bottom.

Answer:
C-x 2

(e) Remove the larger window on the left.

Answer:
C-x o (until the cursor is on the left window), C-x 0

6. Searching in *emacs*.

(a) If 'index.html' is not being displayed then open it in a window. Close all other windows. Search forward for the text 'cse399'. Repeat this search a few times. Then, search backward a few times using the same text.

Answer:
Forward: C-s cse399, C-s (a few times), backward: C-r (a few times)

(b) Replace all instances of the text 'cse399' with the text 'cse398'.

Answer:
M-<, M-x replace-string cse399 cse398

(c) Search forward using regular expressions to match on any non-empty sequence of digits. Repeat this search a few times. Then, search backwards a few times using the same expression.

Answer:
C-M-s [0-9][0-9]*, C-M-r [0-9][0-9]*

(d) Insert 'foo' in front of all non-empty sequence of digits, using regular expression replacement.

Answer:
M-<, M-x replace-regexp <return> \([0-9][0-9]*\) <return> foo\1

7. Cutting, pasting, *etc.*, *emacs*.

(a) Cut the current line of text.

Answer:
C-k

(b) Paste the current line back.

Answer:
C-y

(c) Now cut current line as well as the two lines below it.

Answer:
C-k, C-k, C-k

(d) Paste the three lines back.

Answer:
C-y

(e) Undo the previous paste.

Answer:
C-x u

(f) Type M-x and begin typing some arbitrary text in the minibuffer. Before hitting enter, abort the command.

Answer:
C-g

(g) Paste the first cut made in 7(a).

Answer:
C-y, M-y

(h) Use the repeat command to go forward 10 characters.

Answer:
C-u 10 C-f

(i) Use the command to copy arbitrary text, to copy from the middle of line 5 to the beginning of line 7. Paste this text at the end of the document.

Answer:
(go to the middle of line 5), C-<space>, (go to the beginning of line 7), M-w

8. Modes in *emacs*.

(a) Open a shell in the current buffer. Type a few commands.

Answer:
M-x shell

(b) Open the file 'test.c'. Notice that nothing is tabbed. Hit the <tab> key on each line.

(c) Open two windows. The one on the top should contain 'test.c'. In the other, open the C debugger. When emacs prompts you to enter a file, enter 'test' (an executable compiled from 'test.c'). We're not actually going to look any closer at debugging in emacs in this course, but it is a very useful thing. For a brief introduction, on debugging in emacs see the site: <http://tedlab.mit.edu/~dr/gdbintro.html>.

Answer:
M-x gdb <return> test

9. Customizing *emacs*.

- (a) Run the command, 'M-x load-file', then type 'emacs.el'. This command will load my .emacs file, which contains my customizations. Open the file 'emacs.el' in the current window.
- (b) Emacs is written in lisp, so the code that you see here is also in Lisp. Comment lines are started using ';;'. Anything you can do in the customization file, you can also do directly in emacs. So, for instance, notice the comments are colored using orange. Search for "Set comment color". This command sets the colors of all comments (in any programming language that emacs understands). To change the color directly in emacs, type 'M-x set-face-foreground <return> font-lock-comment-face <return> white'. This changes the comment color to white. Equivalently, you could change the "orange" text in 'emacs.el' to "white" and reload the file. When you have some free time, play around with this file, until emacs is customized the way you want it to be.
- (c) To load these customizations automatically, you need to move them to your ~/.emacs file. If one exists, then open it and copy the contents of 'emacs.el' to your '.emacs' file. You can also simply replace your '.emacs' file with 'emacs.el' if there is nothing you care about saving. To learn more about customizing emacs, I would suggest using google. Try googling "emacs customizing .emacs".