CS35L – Winter 2019

Slide set:	1.2
Slide topics:	Linux basics
Assignment:	1

Follow up – last lab

Basic commands

Structure

Permissions

Special Permissions

sticky bit (o+t)

- On shared directories, it locks files within the directory from being modified/deleted by users other than the file creator, owner of the directory, or root, even if others have write permissions (Example: /tmp)
- Using +t or 1

setuid, setgid (u+s, g+s)

- "set user ID upon execution"
- Run an executable with the permissions/privileges of the executable's owner or group
- +s or 4,2
- For example, the setuid permission on the passwd command makes it possible for a normal user to change passwords by updating few system files like /etc/passwd and /etc/shadow which can't be updated by non-root accounts.

Process: ps and kill

Process

- An instance of a computer program in execution

ps

- List processes that are currently running

kill

- Terminate a certain process
- Usage
  - kill PID

Daemon

A process that runs in the background

Example: cron

- Enables users to schedule jobs to run periodically at certain times (cron jobs)
- Usage: Full Backup every month

diff

A file comparison utility that outputs the differences between two files.

Shows the changes between one version of a file and a former version of the same file

Usage

- diff *original_file new_file*
- *diff –u original_file new_file*

Diff example

```
$cat a
a
b
c
d
e
f
```

```
$cat b
a
b
d
f
g
h
```

```
$ diff -u a b
--- a 2018-04-04 21:34:55.000000000 -0700
+++ b 2018-04-04 21:35:03.000000000 -0700
@@ -1,6 +1,6 @@
 a
 b
-c
 d
-e
 f
+g
+h
```

wget

A computer program that retrieves content from web servers

Usage

- wget <URL>

Emacs

“The customizable, extensible, self documenting, real-time display editor”

Customizable (no programming)

- Users can customize font, colors, etc. in ~/.emacs

Extensible (programming required)

- Run Lisp scripts to define new commands (dired)

Self-documenting

- C-h r (manual) and C-h t (tutorial)

Real-time

- Edits are displayed onscreen as they occur

Getting Started

Install emacs

- Should be installed already

Emacs has both GUI and CLI

All emacs commands start with “C” or “M”

- “C” = ctrl;   “M” = alt (Windows) / option(Mac)

Starting emacs

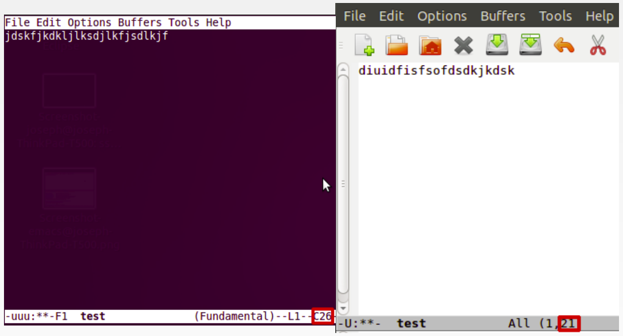
- emacs <filename>

Exiting emacs

- C-x C-c

Saving a file

- C-x C-s


File Edit Options Buffers Tools Help
File Edit Options Buffers Tools Help

```
jdskfjkdkljlksdjlkfjsdlkjf
-uuu:**-F1  test          (Fundamental)--L1--C26
```

```
diuidfisfsofdsdkjkdsk
-U:**-  test          All (1,21
```

Learning to use Emacs - Pointers

Navigating with file

- Move up/down/left/right: C-p, C-n, C-b, C-f (arrow keys also work)
- Move to the beginning/end of a line: C-a, C-e
- Move to the first/last line of the text: M- < M-> (use shift for < and >)
- Move to particular line number: M-g g [number]

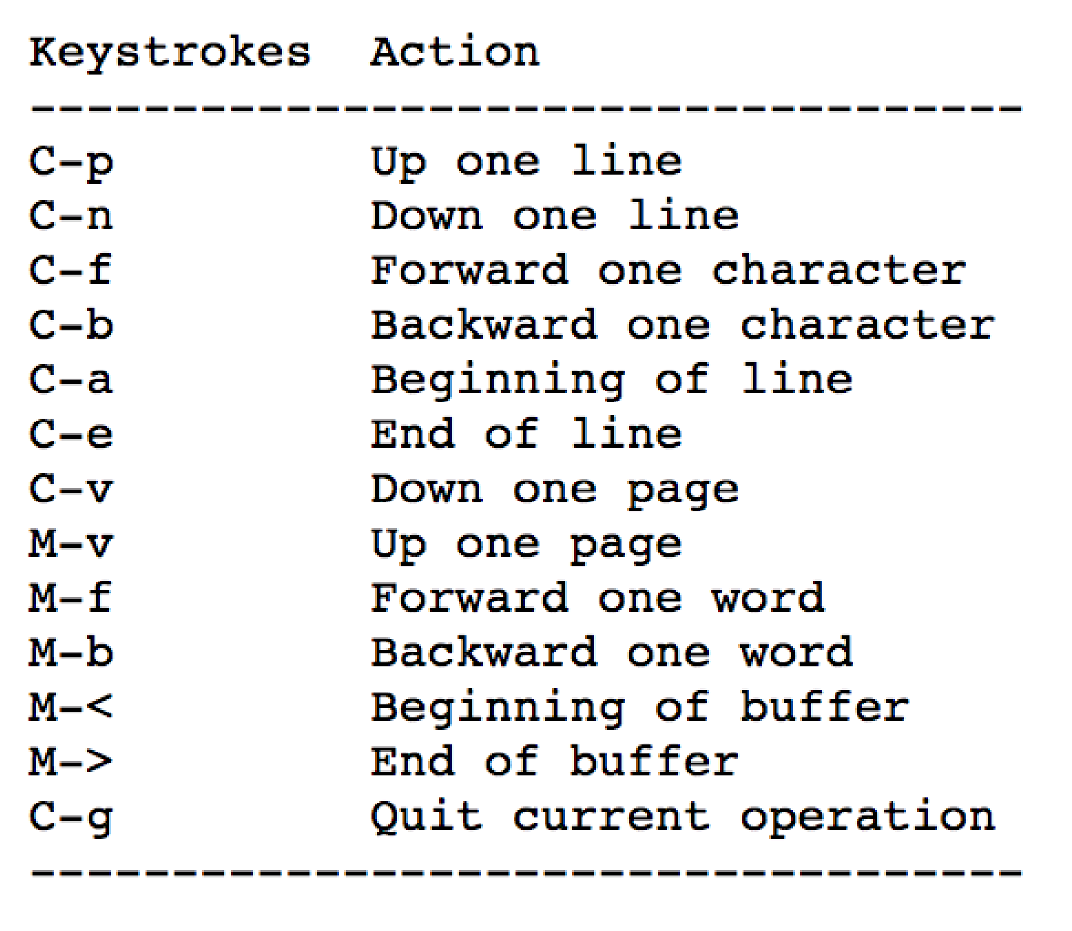
Search and replace file

- C-s: search forward
- C-r: search backward
- M-%: replace (usage: M-% [source] Enter [dest]) (y/n)

Erasing a line

- C-k: erase from current cursor to end of line

Learning to use Emacs - Cheatsheet



```
Keystrokes  Action
-----------------------------------
C-p         Up one line
C-n         Down one line
C-f         Forward one character
C-b         Backward one character
C-a         Beginning of line
C-e         End of line
C-v         Down one page
M-v         Up one page
M-f         Forward one word
M-b         Backward one word
M-<         Beginning of buffer
M->         End of buffer
C-g         Quit current operation
-----------------------------------
```

Learning to use Emacs - contd

Copy and paste in a file

- Begin: C-@ (press Ctrl+Shift+2)
- Use the <up> and <down> buttons to select the contents
- End: C-w (cut), M-w(copy), C-y (paste)
- Undo command: C-x u

Emacs: Cutting is called **killing**, and pasting is called **yanking**

Directory edit (dired) (C-x d)

Creates an Emacs buffer containing list of dir

Allows you to operate on files

- remove, rename, encrypt, decrypt, edit

Allows you to navigate filesystem

- Switch to different directories and list content

Buffers

Visiting Emacs scratch buffer:

- Copy current buffer to file
  C-x C-s
- List all the buffers
  C-x C-b
- Save current buffer with a specified file name
  C-x C-w [filename]
- Add a new file to buffer
  C-x C-f
- Visit *scratch* buffer
  C-x b

Other Emacs Tricks…

Emacs as shell

- M-! <command>, **M-x shell** (interactive shell)

Emacs as IDE

- **M-x compile**, then specify command to compile
- Tip for homework: gcc hello.c –o hello
- Run the executable by running the shell command
  - ./hello

Running Lisp code

- **M-x emacs-lisp-mode**
- C-x C-e : Evaluate expression up to point

Org mode

Org mode is for keeping notes, maintaining TODO lists, planning projects, and authoring documents with a fast and effective plain-text system.

Source: http://pragmaticemacs.com/emacs/org-mode-basics-structuring-your-notes/

Submission details

The files should be ASCII text files with no control characters other than tab and newline (in particular, the files should not contain carriage returns). The shell commands:

```
LC_ALL=C awk '/[^\t\f -~]/' key1.org ans1.org # (if you submit .org files)
```

```
LC_ALL=C awk '/[^\t\f -~]/' key1.txt ans1.txt # (if you submit .txt files)
```

should output nothing.