Introduction to EMACS

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Introduction to Emacs

For this class, we will be using **Cygwin**, an emulation of UNIX for Windows.

To get ready for class do the following:

1) Log on using your RCS Userid and password.

2) Bring up a UNIX window by starting cygwin:
   - Start –> All Programs –> Cygwin –> XTerm

   - After a considerable wait the UNIX window (bash) will open. When the bash prompt (**$**) appears get rid of the lines in the window by typing **clear**.

3) Copy two files to use during class:

cp   /afs/rpi.edu/dept/arc/training/emacs/sample.txt   sample.txt

cp   /afs/rpi.edu/dept/arc/training/emacs/sample2.txt   sample2.txt

Before leaving the class, remember to:
   - Enter **logout** in the bash window
   - Log off the computer from the Start menu

Starting Emacs

To create a new file or edit an existing file, you enter a UNIX command of the form: **emacs**   *filename* substituting the name of your file for *filename*. On a UNIX workstation (or on a PC using a UNIX emulator with X Windows), emacs will open its own X window.

Now, edit your your sample file by issuing the command:

     emacs   sample.txt   &

NOTE: If you append the & to your command, you may continue to issue other commands in your UNIX window while Emacs is running.

- Always use the & if you are at a UNIX workstation or otherwise using X Windows.
- *Do not* use the & if you are accessing UNIX remotely, (for example, using SecureCRT* on a PC).

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*If you are using SecureCRT, we recommend connecting to **rcs-sun4** as this host has a reasonably up-to-date version of Emacs.

Note that you will not be using X-windows and therefore cannot use the menus or mouse functions. See p. 16 for tips on customizing Emacs for SecureCRT.

Buffers

In Emacs, you are never editing the actual file;
you are editing a copy, called a buffer. The Emacs window
is your view of a buffer.
When you save, you write the buffer to the file.

Emacs can split the screen into more than one window to
view different buffers at the same time.

The Parts of an Emacs Screen

1. Top (or main buffer): Holds a copy of the file contents.

2. The status line (bottom of screen):

   --(unmodified) **(modified) %%(read-only)
   File name (or buffer name)
   The mode (more on this later)
   The line number your cursor is on
   Where you are in the file (top, bottom, %)

3. The echo line or mini-buffer (under status line). Used
   for issuing commands or displaying messages.

Basic Editing

Entering text

Just start typing. If the line becomes longer than width of the window, Emacs will put a continuation marker in the right-most column and move to the next line.

By default, you are in "insert mode."

Moving around in a file
- Use the arrow keys to move the cursor.
- Use **Page Down** and **Page Up** to move forward and backward by one screen.
- Use **Ctrl-Home** and **Ctrl-End** to move to beginning and end of file.

Deleting text
- **Backspace** key removes character just before cursor.
- **Delete** or **Ctrl-d** deletes character at the cursor.
- **Ctrl-k** deletes from the cursor to the end of the line.

Undoing changes
- To undo last change, press **Ctrl-x u** (or select "undo" from the Edit menu).
- Repeat to undo earlier changes. (unlimited undo)

Aborting a command

Pressing **Ctrl-g** can get you out of trouble.

Emacs and X-Windows

Menus and Cursor Placement

- The menu bar at the top of the window makes it easy to perform common tasks, such as editing, saving, quitting and finding help.
- You can move the cursor location by pointing the mouse and clicking the left mouse button.

Selecting and copying

- Holding down the left mouse button, drag over the region to be selected. The selected region will be highlighted temporarily.
- Or, click the *left* mouse button at start of text you wish to select. Then click the *right* button *after* the last character you wish to copy. The text to be copied is now selected.
- To copy the selected text, position the cursor anywhere inside any X-window on the screen and press the *middle* button if there is one. On these PCs, you can press both buttons together to simulate the middle button, or select "paste" from the Edit menu.

Exiting and Saving a File

To leave Emacs:
Type **C–x C–c**. Emacs will ask:

Save file *filename*? (y or n)

If you respond **y**, your changes will be saved and Emacs will quit. The previous version of your file will be also be saved. The back-up file will have the same name with a tilde (˜) at the end.

If you respond **n**, Emacs will ask:

Modified buffers exist; exit anyway? (yes or no)

Respond **yes** (type the whole word) to exit without saving changes. If Emacs has done an autosave (which it does from time to time) this version of your file will also be saved. The filename will have a # character at each end.

To save without exiting:
Type **C–x C–s**. Emacs will respond:

Wrote *filename*

where *filename* is the absolute path of your file.

Exercise 1

Edit the file `sample.txt`

- What is the line number of the last line of the file? ____
  (Hint: use Page Down or Ctrl-End key and the arrow keys.)

- Return to top of file and change the title from "Rescuing Yourself in Emacs" to "How to Get Out of Trouble".

- Put the title back the way it was (without retyping it).

- When using X-windows, what can you use the middle mouse button for? _____

- Select the text in parentheses at the top of the file and paste it at the end.

- What **Ctrl** sequence can delete an entire line? _____

- Use this sequence twice to delete the first two lines of the file.

- Exit emacs without saving changes.

Keys

Conventions for indicating key sequences

C– The Control key – Hold down.

M– The "Meta" key is different on different systems: the **Alt** key on IBMs and SGIs, the diamond key on Suns. The Escape key (**E**) works on all systems. Press it and release.

Some key concepts

C–*key* or **E** *key* Action performed immediately.
　　Example: **C–d** deletes character at cursor.
　　　　　　E k deletes from cursor to end
　　　　　　of sentence.

C–x ... Execute "two-key" function. Action performed immediately when next character is entered. Example: **C–x u** undoes last change.

E x Cursor to mini-buffer.
　　Enter command and press **Return**. Example:
　　E x auto-fill-mode toggles word wrap on & off.

Using Keys to Move Around

Alternatives to arrow keys

- **C–n** and **C–p**: next and previous line

- **C–f** and **C–b**: forward and back 1 character

- **E f** and **E b**: forward and back 1 word

- **C–a** and **C–e**: beginning and end of line

- **E a** and **E e**: beginning and end of sentence

Alternatives to PgDn, PgUp, Ctrl-Home, Ctrl-End

- **C–v** and **E v**: forward and back 1 screen

- **E $<$ and E $>$**: beginning and end of file

Using line numbers

- **E x goto-line**: go to specific line number
  (type **goto-line**, press **Return**,
  type line number, press **Return**)

  [An easier way is to assign a key sequence to perform
  the goto-line function. See page 16.]

Cut (or Copy) and Paste

Not dependent on X-windows

1. Define a region

A region is the text between the *mark* and the *point*. To define a region, you first set a mark at the beginning and then move your cursor to end. (The point is where your cursor currently is.)

- Move your cursor to the beginning of region.
- **C–Space** (or **C–@**): set a mark.
- Move your cursor (the point) to end of region.
  Do this using the arrow keys or control sequences.

2. Cut or copy the region to buffer

- **C–w**: Cut the region to the cut buffer.

  or
- **E w**: Copy the region to the cut buffer

3. Paste to new location

- Move cursor to where the text is to be inserted.
- **C–y**: "Yank" text from the cut buffer and paste in new location.

Searching

- **C–s**, then type the text. Searches forward.
- **C–r**, then type the text. Searches backward.
- Continue to search for the text further on in the file by re-entering **C–s** or **C–r**.
- Press **Enter** to leave search mode.
- **C–g**: Abort the search.

Some notes:

- The search begins when you type the first character; moves on as you continue typing.
- Searches ignore the case of the text.

You can also search for a sequence of one or more words, regardless of how they are separated (e.g., multiple spaces or linebreaks):

- **C–s** [RET] **C–w** *word word word* [RET]

Note to remote users: Some communications equipment uses **C–s** for communications flow control (Xon/Xoff), which renders **C–s** unusable for searches. Use **C–r** (reverse search) instead. (If you press **C–s** by mistake, press **C–q** to unfreeze your session.)

Replacing Text

Global replacement

To replace all occurrences of a string:

- Move cursor to top of file.
- Type **E x**, **replace-string**. Press **Return**.
- Type the text to be replaced, press **Return**.
- Type the new text, press **Return**.

Query replacement

To be queried at each occurrence of the string:

- Move cursor to top of file.
- Type **E %**
- Type the text to be replaced, press **Return**.
- Type the new text, press **Return**.

At each occurrence, Emacs will ask whether you want to replace the string. Some responses are:

y *change this one*
n *leave this one unchanged*
! *change all the rest without prompting*
q *abort the replace command*

Exercise 2

Edit the file `sample.txt`

- On what line number is the *last* occurence of the word "Emacs"? ____
  (Hint: use the forward search key sequence.)

- Find the phrase, "It is simple". What line number does it end on? ____

- Replace all occurences of "Emacs" with "Gnu Emacs". What happens if you don't return to the beginning of the file before trying to do this?

  _____

- How many sentences in the first paragraph? ____
  (Hint: How many times must you press **Esc e** to reach the end?)

- Pretend you are not using X-windows (i.e., you can't drag the mouse to highlight and you have no middle mouse button), and move (not copy) the text in parentheses at the top of the file to the end of the file.

- Start by pressing **Esc x** and go to the line number you found for the last occurence of "Emacs". (Is "Emacs" still on that line?)

- Exit emacs without saving changes.

Spelling Checking

The "Ispell" spelling checker is built into Emacs. To use it:

● **E x ispell-buffer**

                or

● From the **Tools** menu:

select **Spell checking**, then **Spell-Check buffer**.

You can also choose to check a word or a region.

In addition to its own dictionary, ispell will use your personal dictionary, called by default **.ispell_words**. To use a personal dictionary, create an empty file *in your home directory* called .ispell_words.

Ispell will display a "wrong" word at the top of the screen, along with a numbered list of possible replacements. To replace the word, type the number of the replacement you want. Other responses are:

R   You'll be prompted to replace the word.
Space Accept the word this time only.
A   Accept word for the rest of this ispell session.
I   Accept word and update private dictionary.
Q   Quit Ispell.

To find out more about ispell, see the man page.

Modes

Major modes

Emacs uses *modes* that customize editing for text of a particular sort. The mode often adds additional keys and commands that help with the editing. Some examples:

- fundamental-mode (the default)
- text-mode
- indented-text-mode
- tex-mode
- c-mode
- fortran-mode

Use **E x** *mode-name* **Return** to switch among modes. The name of the mode is displayed at the bottom of the screen following the filename.

Use **C–h m** to display help about current mode.

Minor Modes

Minor modes do not affect the special commands of major modes. Some examples:

- **auto-fill-mode** (for word wrap)
- **overwrite-mode** (instead of insert mode)

Other Useful Commands

Reformatting a paragraph

Use the following anywhere within the paragraph:

- **E q**: reformat
- **C–u E q**: reformat and right justify

Centering

If you are in text-mode, you can center a line:

- **E s**: center current line

Inserting a file
- Place cursor where you want to insert file.
- Press **C–x i**
- Type filename in mini-buffer, press **Return**. Note you can use ˜/ to refer to your home directory.

Word Completion

Emacs will try to complete partially typed file and command names. After typing a few characters of a command or file name, press the Tab key to try completion.

On-line Help

You can access help from the Emacs **Help** menu. Or you can use the following commands:

- **C–h**: Enters help mode.*
- **C–h C–h**: Displays summary of help commands.
- **C–h F**: Displays the Emacs FAQ.
- **C–h t**: Starts the Emacs tutorial.
- **C–h c**: After you type a command (for example **C–s**, Emacs displays a brief description of the command.
- **C–h k**: Similar to **C–h c** (above) but gives a detailed description of the command.

To close the help text window:

  C–x 1 if window is "split screen"
          (be sure cursor is in main window)
  C–x k followed by **Return** to kill full screen help

There is a large (over 600 pages) on-line manual. You can read it within Emacs: **Help** → **Read Emacs manual**. Or you can view a PDF version on the web at:
http://www.rpi.edu/ bortonh/Emacs-class/emacs-v21.pdf

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*Note you may also enter help mode by typing **E x help**, followed by **Return**. This may help for remote use on systems where **C–h** performs the backspace function.

Customizing Emacs

When it starts up, Emacs reads a file called **.emacs** (if there is one) in your home directory. Below are some commands you might want to put in this file. The lines beginning with ;;; are comments.

```
;;; start up using text-mode
(setq default-major-mode 'text-mode)
;;; turn on word wrap when in text mode
(setq text-mode-hook 'turn-on-auto-fill)
;;; set fill column to 75 (default is 70)
(setq default-fill-column 75)
;;; Make Esc g do "goto-line"
(global-set-key "\M-g" 'goto-line)
```

A sample .emacs file that contains these and a few more commands is in the RCS file:

/afs/rpi.edu/home/23/bortonh/public/dotemacs.

For SecureCRT (recommended host: `rcs-sun4.rpi.edu`)
```
;;; Make Home, End, PageUp, PageDown keys work:
(load "securecrt")
```
(on rcs-sun4, this file is in /opt/csw/share/emacs/site-lisp/securecrt.el)

NOTE: Also do the following on the SecureCRT menu:

Options –> Session Options... –> Click on "Emulation"
Then in the box for "Terminal" select VT220

For LaTeX Users
```
;;; Load Auctex:
(require 'tex-site)
;;; List printers for the Print option in Command menu:
(setq TeX-printer-list '(("vclw") ("vcpap3") ("vc200ovr")))
```

Exercise 3

Edit the file `sample2.txt`

- What major mode are you using? _____

- Center the first two lines in the file. Will the method you used work in a file whose name does not end in ".txt"? _____
  Explain: _____

- Find the misspelled word in the file and correct it. What was it? _____

- Place the cursor in each of the following paragraphs and reformat it so the lines are not so uneven.

- Turn on auto-fill-mode (a minor mode). (Try command-name completion by using the Tab key.)

- At the end of the file, type a few new lines to observe word wrap.

- Leave emacs without saving changes.

Summary of Basic Emacs Commands

Starting and Leaving Emacs
emacs *filename* **[&]**   start Emacs
C–x C–c   leave Emacs
C–x C–s   save file without leaving Emacs

Bailing Out
C–x u (or Control␣)   undo last change
C–g   abort a command

Cursor Movement
C–n   next line
C–p   previous line
C–f   forward 1 character
C–b   back 1 character
E f   forward 1 word
E b   back 1 word
C–a   beginning of line
C–e   end of line
E a   beginning of sentence
E e   end of sentence

Moving Around in File
C–v   forward 1 screen
E v   back 1 screen
E <   beginning of file
E >   end of file
E x goto-line   go to specific line number

Deleting Text
Delete (or Backspace)   delete character before cursor
C–d   delete character at the cursor
C–k   delete from the cursor to the end of the line
E k   delete from the cursor to the end of the sentence

Cut, Copy and Paste
C–Space (or C–@)   set a mark
C–w   Cut the region to the cut buffer
E w   Copy the region to the cut buffer
C-y   "Yank" text from the cut buffer and paste in new location

Search and Replace
C–s   initiate forward search
C–r   initiate backward search
C–s, press RET, C–w   initiate search for multiple words
E x replace-string   global replace
E %   query replace

Miscellaneous Commands
E q   reformat paragraph
C–u E q   reformat and right justify paragraph
E x auto-fill-mode   toggle word-wrap on/off
E x text-mode   switch to text mode
E s   center a line (text mode only)
C-u *n*   specify number for next command
C–x i   insert a file
C–h   Enter help mode (E x help Return also works; helpful for remote access)