2170 Unix and vi commands

1. **Frequently used Unix commands :**

   First, start a "terminal" by selecting it from the applications drop down menu

   ls list the files and directories in your current directory
   cd change directory -- to move around in your *file system*
   pwd print working directory -- "where am I in my file system?"
   mkdir create directory – to organize your relevant files into groups
   cp copy files
   mv change file (or directory) name
   rm delete a file
   rmdir remove directory
   more peruse the content of a file
   less
   cat
   man show manual pages
   ! + one character repeat the previous Unix command that starts with that character
   up and down arrow brings up the previously entered commands

- **Compiler : a software that translates a program written in high level language into machine language**
  The C++ compiler we use is called **c++**.
  It consists of the following programs:
  (a) the preprocessor : prepare the code for translation by substituting into the source code special code libraries → translation unit
  (b) the translator : actually translates the code into machine language → object module
  (c) the linker : assembles object modules and necessary system defined functions to form the executable program

- Compile, execute, scripting, and printing C++ program
  - To compile a C++ program:
    ranger% c++ prog1.cpp → this generates executable file *a.out*
    or
    ranger % c++ prog1.cpp -o run1 → this generates executable file *run1*

  - To execute the program:
    ranger % *a.out*
    or
    ranger % *run1*

  - To create a script of the file that contains the source code of the program, and compilation information, and the execution of the program:
    ranger % script log
    ranger % pr –n -t -e4 prog1.cpp
    ranger % c++ prog1.cpp –o run1
    ranger % run1
    ranger % exit

2. **Vi (visual editor) :** editor to create/edit C++ files

- There are three modes in vi : command mode, insertion mode and last line mode
- When a file is first created, it is in the command mode
- To change from command mode to insertion mode, type any of the following

i	insert at the cursor
a	append to the right of cursor
A	move the cursor to the end of the current line and put you into insert mode
o	open a new line below the cursor and insert
O	open a new line above the cursor and insert

Once in insertion mode, type the content of the file, ENTER to change line. Use left, right, up, and down arrow keys to move the cursor to desired place in the file and edit. BACKSPACE key deletes the previous character typed in.

- To change from insertion mode to command mode, type the ESC key
- Frequently used vi commands are:

cursor movement:

0	Move cursor to the beginning of the line
$	move cursor to the end of the line
w	move to the beginning of the next word
: + number	move cursor to a particular line, e.g., :20 moves cursor to line 20
CTRL+g	display the current line number
CTRL+f	forward one screen
CTRL+b	backward one screen
CTRL+d	forward half screen
CTRL+u	backward half screen

deletion:

x	deletes the character at cursor
X	deletes the character to the left of cursor
dw	deletes the word to the right of cursor
dd	deletes the current line

cut and paste:

4dd	cut the 4 lines starting at cursor
4yy	copy (yank) 4 lines starting at cursor
p	paste the (cut/yanked)content below cursor
P	paste the (cut/yanked)content above cursor

pattern search:

/+a character string search for the string in the file

n	move the cursor to the next appearance of the string in the file

save file / quit editor:

:wq	save the file and exit vi editor
:w	save the file without exit the editor
:w filename	save the file to a different file name
:q!	quit the editor without save the file

3. **Something you will use in many open and closed labs:**

- To copy a data file into a project directory
    - Starting from your top directory navigate to the project directory:
        - Use the **cd** command. You can use cd command repeatedly as you navigate down the file system, starting from the home directory. You can also specify the whole path to go straight from the home directory to the specific project directory
    - Once in the project directory, copy the data file from Dr. Li's data directory:
        - Use the cp command.
        - **cp ~cen/data/example.dat .** ← noticing the trailing period, this copies the data file into the project directory keeping the same file name
    - You can use the **ls** command to check and verify if the data is actually in the project directory now
    - You can peruse the data file using the **more** command
        - This is important because you need to know the exact format of the data file to be able to write the program that reads the correct information from it