UEE1302(1066) F12: Introduction to Computers and Programming

Lab 1 : Programming in UNIX/LINUX Systems

What you will learn from Lab 1

In this laboratory, you will learn how to exploit the computer facilities in NCTU to write your program.

TASK 1-0 : DOWNLOAD PIETTY

- ✓ (Ignore this step if your computer has had this freeware on desktop.)
- \checkmark Start I.E. or firefox and download the freeware PieTTY from

```
http://ntu.csie.org/~piaip/pietty/
```

 \checkmark Save it to the desktop of the computer you are using.

TASK 1-1 : WORKING WITH UNIX/LINUX MACHINES

- ✓ Computer & Network Center at NCTU
 - ➢ ccsun15.cc.nctu.edu.tw
- ✓ Click PieTTY to start
 - Specify the machine name/ip as one of the following:
 - ♦ 140.113.170.175
 - Select SSH, not Telnet(BBS)
- \checkmark Authentication
 - Username: Student ID #
 - Password: UEE1302-StudentID#

Example:

login as: 9923501

9923501@140.113.170.175's password: UEE1302-9923501

TASK 1-2 : PROGRAMMING IN LINUX SYSTEM

- \checkmark Editing a program
 - Start the editor software <**vim**> and edit a file
 - \diamond vim_<filename>.cpp
 - ♦ (Example) >vim_hello.cpp ↓

Program example: lab_1-1

```
//File:_lab_1-1.cpp
#include_<iostream>
using_namespace_std;
...
int_main()
{
    _____cout_<<_"Hello,_world!"_<<_endl;
...
return_0;
}</pre>
```

- Introduction to <vim>: 3 modes:
 - 1. Command mode: all keystrokes are interpreted as commands
 - 2. Insert mode: most keystrokes are inserted as text (leaving out those with modifier keys)
 - 3. Visual mode: helps to visually select some text, may be seen as a submode of the command mode.
- > To switch from the insert or visual mode to the command mode, type $\langle Esc \rangle$.
 - \diamond To switch from the command mode to the insert mode type one of
 - **i** switch to insert mode before the current position
 - **a** switch to insert mode after the current position (append)
 - **I** jump to the first non-blank character in the current line and switch to the insert mode
 - **A** jump to the last character of the current line and switch to the insert mode
 - \diamond To switch from the command mode to the visual mode type one of
 - **v** switch to the visual mode (character oriented)
 - **V** switch to the visual mode (line oriented)
 - Ctrl-v switch to the block-visual mode (select rectangles of text)
 - All commands that take a range (for example substitution, delete, copy or indentation) work with the visual mode too.
- Related instruction

i,l,o,O,a,A,r,R	Normal mode to Insert mode	
:,/	Normal mode to Command mode	

h j k l	Move the cursor to the left, down, up, right, respectively.	
	These also take a count: '81' moves the cursor 8 letters to the	
	right.	

w W b B	Move forward ('w' and 'W') or back ('b' and 'B') by a word.	
	'w' and 'b' treat anything non-alphanumeric as a word	
	delimiter; 'W' and 'B' honor only white space.	
} {	Move to end of current or previous paragraph, respectively.	
)(Move to end of current or previous sentence, respectively.	
x X	Delete the current word or the word before the cursor.	
dd	Delete a line.	
u	Previous step	

:w filename	Write (save) the current document. If the optional <i>filename</i>	
	is provided, the text is saved in the specified file.	
:q	Quit the editor.	
:wq or :x	Save and Quit.	
:e filename	Load the specified file into the editor.	
:n	Load the next file into the editor. Useful when vi was	
	invoked from the command line with multiple file names.	
:r filename	Read (insert) the content of the specified file into the	
	current document	

- > For more information, please refer to the following websites:
 - http://linux.vbird.org/linux_basic/0310vi.php
 - http://tips.webdesign10.com/another-vim-tutorial
- ✓ Compile the Program
 - Save the edited program and quit <vim>.
 - > g++_<file_name>.cpp_-o_<program_name>
 - ♦ (Example) >g++_hello.cpp_-o_hello_J
 - Check if any error occurs. If there is an error, the message will be printed out. Try to correct the error according to the system response.

✓ Execute the Program

- > If the compilation succeeds, run the program you specified under the current directory.
- >./<program_name>
 - ♦ (Example) >./hello ↓

TASK 1-3 : EXERCISES

✓ Modify the previous program to show your name, student ID, and a few sentences to introduce yourself.

 \checkmark The required format is shown as follows,

>./exercise_1-1			
I_am_Jeremy Lin.			
My_student_number_is_9923501.			
I_like_C++_programming_very_much.			
>			

Appendix – Directory and file Management instructions in LINUX

Path Management		File Management	
cd	Change directory	ls	Show file name and its
			property
pwd	Print working directory	ср	Сору
mkdir	Make directory	rm	Remove
rmdir	Remove directory	mv	move

- ✓ Instruction Help
 - > man_<required_instruction>
 - > cat_<required_instruction>