資料結構與程式設計

(Data Structure and Programming)

101 學年上學期複選必修課程 901 31900

Homework #1.1 (Due: 11:00pm, Oct 02, 2012)

Department:_____ Grade:_____

Id:_____ Name:_____

1. Describe your Linux environment. Answer in a file "hw1.1.p1.txt".
   (a) Which Linux machine(s) do you use? Do you install Linux on your own computer, or do you use the Linux workstation(s) in some laboratory, or do you use "virtual machine" such as "vmware/virtual box", or do you use "secure shell" (or telnet) program to remotely login a Linux machine(s)? Or multiple choices of the above? Please describe.
   (b) Pick one of the Linux machines you are using. Is it a laptop, desktop PC, or anything else? Is it a shared computer (i.e. shared by multiple users)? How big is the disk space and memory size? Type "df" command in any directory, and type "du" command in different directories. What do you see? What do they mean?
   (c) Who is the distributor (e.g. Fedora, Ubuntu, etc) of the Linux OS you use? Which version?
   (d) What kind of shell do you use? How do you know it? What is your home directory? What is(are) the group(s) you belong to?
   (e) Can you locate "g++", "make", "gdb", and "ddd"? What are the paths of these programs? If you cannot find some of them, install the programs first, or find a machine that has them. You will need these programs in later homework. What are the versions of these programs?
   (f) Please try to display an X client GUI program such as "ddd" or "xclock" on your machine. If you are using "secure shell" or "telnet" program to remotely login some Linux workstation, you will need to make sure you have the X server and X forwarding properly setup. If you are using virtual machine, please just make sure you can see the display. Please describe how you display the X client program.

2. Linux commands:

   In this problem, you will learn how to use "*man*" or other resource to figure out the usage of the Linux commands. Output pipe '|' or redirection '>' may be needed. Please describe the commands you use and put them in files "hw1.1.p2a.cmd", "hw1.1.p2b.cmd,... etc, respectively, and turn in the resulted log files as specified.

   (a) How many files are there under your home directory? Please include hidden files (i.e. filename with "." in the beginning, for example, ".bashrc") and all files under the subdirectories, recursively. Please describe how to count them.

   (b) Make sure your Linux system is connected to the internet. Use "wget" command to download: http://dl.dropbox.com/u/26155979/hw1.1.p2.log to your homework directory. Then do the following: (1) use "grep" command ONLY to **remove** the lines from the file "hw1.1.p2.log" that contain the "`  Darr (nothing)`" pattern, and then (2) use "grep" command ONLY to extract the lines from (1) with the pattern "Output Transition Time" and use the command "sort" to sort them in the ascending order of the **transition time**. Prefix each line of output with the original line number in "hw1.1.p2.log". Here's part of the answer:

```
10002:   Output Transition Time: -115.761
12767:   Output Transition Time: -115.761
15690:   Output Transition Time: -115.761
.....
9980:   Output Transition Time: 0
9991:   Output Transition Time: 0
10181:   Output Transition Time: 1.1775
12077:   Output Transition Time: 1.1775
.....
9517:   Output Transition Time: 1.98919
9754:   Output Transition Time: 1.98919
10533:   Output Transition Time: 2.57973
12192:   Output Transition Time: 2.57973
.....
34176:   Output Transition Time: 69.1045
24380:   Output Transition Time: 70.7652
25723:   Output Transition Time: 70.7652
36230:   Output Transition Time: 70.7652
```

   There should be totally 3500 lines. Save the file as "hw1.1.p2b.log".

3. Open file "hw1.1.p3.dat", use "vim" editor to modify the file as follows.

   (a) Place your cursor at the first line.

   (b) Record a MACRO command that performs the following actions:

      (i) Search for the "Name" pattern.

(ii) Delete the characters from the current cursor position to the character before "U" in this line. (Hint: d/U)

(iii) Join the next line.

(iv) Delete the characters from the current cursor position to ':' in this line.

(v) Repeat (iii) and (iv).

After perform one MACRO command, you should see the second line as:

```
U14 0 0
```

(c) Repeat the MACRO command as many times as possible (i.e. until the pattern "Name" is not found).

The resulted file should look like:

```
================================================================
U14 0 0
U13 0 0
U12 2.70902 1.88738
U11 18.214 12.7616
U10 0 0
U9 0 0
U8 0 0
================================================================
U14 3.25426 1.67027
U13 0 0
U12 0 0
U11 0 1.67027
U10 0 0
U9 0 0
U8 0 0
.....
```

There should be totally 4000 lines. Describe the commands you use in a file "hw1.1.p3.cmd" and turn in the resulted log file as "hw1.1.p3.log".

Notes: Please pay attention to the homework rules on the website. Failure to abide by the rules may result in deduction in homework points.