

**Dalhousie University**  
**CSCI 2132 — Software Development**  
**Winter 2017**  
**Assignment 1**

*Distributed Wednesday, January 18 2017.*

*Due 3:00PM, Wednesday, January 25 2017.*

**Instructions:**

1. The difficulty rating of this assignment is *bronze*. Please read the course web page for more information about assignment difficulty rating, late policy (no late assignments are accepted) and grace periods before you start.
2. Each question in this assignment requires you to create one or more regular files on bluenose. Use the exact names (case-sensitive) as specified by each question.
3. Create a directory named **a1** that contains the following files (these are the files that assignment questions ask you to create): **a1q1.txt**, **a1q2.txt**, **a1q3\_a.txt**, **a1q3\_b.txt**, **a1q3\_c.txt** and **a1q3\_d.txt**. Submit this directory electronically using the command **submit**. The instructions of using **submit** can be found at:  
  
<http://web.cs.dal.ca/~mhe/csci2132/assignments.htm>
4. Do NOT submit hard copies of your work.

**Questions:**

1. [10 marks] Give concise answers to the two questions below. Use either **emacs** or **vi** to type your answers in one single plain ASCII file, with **a1q1.txt** as its name. Each line of this file should have at most 80 characters.
  - (i) [7 marks] We learned that a complete UNIX operating system includes a kernel and a shell. The following are some functions of UNIX. Write down which functions are provided by the kernel and which are the functions of the shell.
    - Handling file storage
    - Providing a text-based interface
    - Allocating CPU time to programs
    - Interpreting user commands
    - Allocating memory to programs
    - Arranging for the execution of users commands

– Handling communications in response to system calls

- (ii) [3 marks] What does the `..` entry in a directory point to? What does this entry point to in the root (`/`) directory?

2. [10 marks] Read the instructions of using `script` available at:

<http://web.cs.dal.ca/~mhe/csci2132/assignments.htm>

Before starting to work on this question, make sure that your current working directory is a directory that you created yourself (do NOT use `script` to record how you achieve this).

Write UNIX commands to perform the following tasks one by one, and use the `script` command to record their executions in a single file named `a1q2.txt`:

- (a) Use the UNIX command `cat` to create a file named `id` that has exactly four lines. These four lines, from line 1 to line 4, are your full name, your CSID (i.e. your user name on bluenose), your banner id (i.e., your student id that starts with B00), and your Net ID;
  - (b) Use `cat` to show the content of the file created;
  - (c) Enter a UNIX command to verify that this file has exactly four lines. Your command should print a single integer (to the monitor) that is the number of lines in this file followed by a space character and then the file name;
  - (d) Enter a UNIX command to print the number of characters in this file. Your command should print a single integer (to the monitor) that is the number of characters in this file followed by a space character and then the file name;
  - (e) Enter a UNIX command to check the permissions of the file `id`;
  - (f) Remove group and others read permissions from this file without changing any other permission settings;
  - (g) Enter a UNIX command to show the permissions of the file `id` again to verify that this task has been performed successfully;
  - (h) Enter a UNIX command to print only the last line of this file to the monitor;
  - (i) Run the above command again, but this time redirect the output and save it in a file named `netid`;
  - (j) Use `cat` to verify that file `netid` indeed has your Net ID only.
3. [10 marks] This question asks you to use wildcards. Use `ls` command to perform the tasks below, and use `script` to record your most successful execution. For each subquestion, you are required to use only one UNIX command.

Your command lines must work no matter what the current working directory is. Even though you are asked to list files in the directory `/usr/bin`, your command line should work when you use it for another directory.

The names of the files to be generated by `script`, for the four questions below, are `a1q3_a.txt`, `a1q3_b.txt`, `a1q3_c.txt` and `a1q3_d.txt`.

- (a) Print a list of files in directory `/usr/bin` whose names start with the word “python”. The file named `python` in this directory is considered one of these files.
- (b) Print a list of files in directory `/usr/bin` whose names are five characters long and start with one of these four characters: `u`, `n`, `i` and `x`. For example, `xmlwf` is such a file, but `nano` and `zgrep` are not.
- (c) Print a list of files in directory `/usr/bin` whose names start with `a`, `b`, `c` or `d` and end with a digit. For example, `c99` is such a file, but `cal` and `linux64` are not.
- (d) Print a list of files in directory `/usr/bin` whose names are at least three characters long and that the second and third characters in their names are not lowercase English letters. For example, `411toppm` and `g++` are such files, but `h2pas` is not.