COSC2306 – UNIX

Assignment 1

Due Friday, September, 12th at 4:00 p.m.

Instructions: All answers are to be submitted on this paper. Late assignments will be penalized 20% per day to a maximum of one day. No assignments will be accepted after 4:00 p.m. on Saturday September 13th.

Hints and Tips: Be brief and concise. The marking scheme should give you an indication of how many specific points are required. **All answers should be in your own words or properly cited where necessary.**

All of your submissions will be located under your home directory in a subdirectory `cosc2306/a1`. All files will be collected at the due date/time; any files not present will not be collected and will not be considered for marking.

Section 1: Instructions

The following 4 questions all make use of the **`script`** command. Therefore before continuing you should learn how the **`script`** command functions. In particular learn how to start the **`script`** command, how to direct the output of **`script`** to a specific filename instead of the default filename "typescript" and how to exit **`script`**.

In some cases there are different ways you can complete required tasks. You are free to be creative provided they are all done on the **`command line`** and not in the GUI.

If I cannot find the proper `script` command output file or if the output file is called "`typescript`" there is a chance that you will receive only part marks or no marks at all so it is important to be clear on how the `script` command works. Also, when the question is complete you can verify the contents of the output file in a number of ways.

Practice these commands BEFORE you run the `script` command to reduce the chance of making errors.

When you run the `script` command, if you make ***some*** errors do not worry. As long as you complete the tasks and your output file is readable you will earn the marks. However if you make many errors you might consider deleting the script file, undoing the tasks and starting over to make your output file more readable. Overly messy output files (ie. full of errors) may receive some deduction if they are too difficult to interpret.

Section 1 (15 marks):

1. (6 marks) Log into shell.cs.laurentian.ca or use the command prompt on a lab machine (terminal session or ctrl-alt-F1). Start the **`script`** command *but* have the output go to a file name **`question1`** instead of `typescript` (the default for the script command). Complete the following tasks.
    a. In your home directory create a new directory called **`cosc2306`**.
    b. In your `cosc2306` directory create a new directory called **`a1`**.
    c. In your `a1` directory create a new file called **`firstfile`** that contains the text "Hello World!".
    d. Make a copy of `firstfile` called **`secondfile`**.
    e. Output a list of all users currently logged into the system and save this output to a file called **`UseRs`**.
    f. Output the contents of the file **`UseRs`**.
    g. Exit the `script` command.
    h. Move file **`question1`** to `cosc2301/a1` for marking.

2. (5 marks) At a command prompt (shell.cs.laurentian.ca or on a lab machine) start the **`script`** command (with output going to a file called **`question2`**). Change directories to `cosc2306/a1` and complete the following tasks:
    a. Using only **one** command create 4 directories at once called `sub1` which is in directory `a1`, `sub2` which is located in `sub1`, `sub3` which is in `sub2` and `sub4` which is in `sub3`. (If you are unable to do this in one command then you can complete it in multiple commands with a 1.0 mark deduction).
    b. Do not change directories (ie. stay in `cosc2306/a1`) and delete directory `sub4`.
    c. Again, do not change directories and **`touch`** an empty file called **`testfile`** in `sub3`.
    d. Do not change directories and delete `sub3` using only one command (Hint: you may need to delete the directory `sub3` and it's contents simultaneously).
    e. Do not change directories and delete directory `sub1`.
    f. Exit the `script` command.
    g. Move file **`question2`** to `cosc2301/a1` for marking.

3. (2 marks) Suppose that you have a directory called **`myfiles`**. Come up with 2 **distinct** ways to create an ******exact**** duplicate of **`myfiles`** called **`myfilesbackup`** and remove the original. Change directories to `cosc2306/a1` and start the **`script`** command (with output going to a file called **`question3`**). Show the exact commands needed for both methods. **Hint**: With **`script`** still running you can remove the **`myfilesbackup`** directory between your two attempts.

4. (2 marks) At a command prompt (shell.cs.laurentian.ca or on a lab machine) change directories to `cosc2306/a1` and start the **`script`** command (with output going to a file called **`question4`**). Run the following command:

```
echo "INVINCIBLE" > -x
```

This uses standard output (>) to create a file with name `-x`.

With the script command still running provide **two** ways (the exact commands) of deleting the file `-x` **without** deleting the entire directory that contains it and without deleting any other files contained in the same directory? **Hint1**: Create a subdirectory somewhere else to practice this. You ~could~ end up deleting all of the files in your home directory or in your `a1` directory if you are not careful. **Hint2:** You will need to rerun the command given above to recreate the **`–x`** file between attempt 1 and 2.

Section 2 (15 marks):

For this section you may use one of the Linux GUI text utilities (OpenOffice, GEdit, JEdit to name a few). Place all of your answers in a single file called **`Section2`** in `cosc2306/a1`. Since all of these questions will be in the same file make sure you clearly number your answers.

Place your name and student number at the top of your file.

1. (2 marks) What is the difference between a *process* and a *program*?
2. (2 marks) What is the UNIX/Linux Philosophy?
3. (2 marks) In terms of security, what is the purpose of groups?

4. Consider the following piped command: ls –l | wc –l

   a. (1 mark) What do you suppose the ***intended*** output is?
   b. (1 marks) Is the output completely accurate? If not, how much is it off by and why?
   c. (1 mark) Can you suggest a more accurate command or set of piped commands?

5. (2 marks) On shell.cs.laurentian.ca you won't find the `cd` command on the file system either in `/bin` or `/usr/bin` yet you are still able to execute it as a command. Where does it come from then? Is this behavior good or bad? Justify your answer.

6. (2 marks) Briefly state the difference between **absolute** vs. **relative** path names and give meaningful examples of each (multiple examples if necessary) to support your answer.

7. (1 mark) At the end of your file, state which GUI program you used to write your answers.

Section 3 (15 marks):

During the first lecture we only briefly touched on some of the reasons why it is important to learn UNIX/Linux. There are many more reasons beyond what we discussed and here is your opportunity to investigate one/some a bit further. Consider the following question:

`Why is it important to learn UNIX/Linux?`

Since this is a computer **science** course this is also an opportunity to do some scientific-style writing. By this I mean to say that your opinion is important but finding references that support it makes it even more valuable.

You will be marked based on 1) the appropriateness and quality of the references (minimum of 3) you find that support your statements 2) the impression that you actually read and understood the references and 3) the strength of your argument. You may also choose to answer "Why is it NOT important to learn UNIX/Linux" but I warn you, it will be much harder to convince me.

Instructions:
-Maximum one typed page single-spaced.
-Make sure that you include your references (websites, journal articles, books, etc.) at the end of your page. If I am unable to find or access your references there will be a deduction.
-At the top of your answer be sure to include your name and student number.
-At the end of your answer tell me what program your composed your answer in (ie. "I wrote this answer in OpenOfficeWriter.")
-name your file **`Section3`** and save it in your `cosc2306/a1` directory.

15 Marks: appropriate references /5, reference comprehension /5, convincing argument /5