COMP 302 System Programming
Lab Assignment 4

Introduction

In this lab you will explore redirection, expansion and permission commands. Submit your solutions to the questions below in a text file. Name your file in name_surname.txt format. Submit your solutions file to Canvas.

1. Implement the following script named `quote_demo`

```
cat > quote_demo
two_liner="This is line 1.
This is line 2."
echo "$two_liner"
echo $two_liner
```

Then press Cntrl-D to exit from `cat`. Make the script readable, writable, and executable by the file owner only using `chmod` command. Include your command to your solution document.

2. Run the script named `quote_demo`, which you implemented in question 1. Explain why you see a different output from the two `echo` commands.

3. You can use the `touch` utility to generate an empty file. Use `touch` to generate a file named `boy`.

4. Use `ls` command to display the permissions of the file you generated in question 3. Who owns the file? To which group does it belong to? Which permissions does the owner of the file have? Which permissions does the group have? Which permissions do the others have?

5. Display the permissions of `/bin/bash`. Who owns the file? To which group does it belong to? Which permissions does the owner of the file have? Which permissions does the group have? Which permissions do the others have?

6. Only the owner of the file can change the permissions of a file. Using numeric arguments to `chmod`, change the permissions of the file you produced in question 3 so that the owner has read and write permissions and the group and others have no permissions. Display the permissions after you made the change.

7. Change the permissions of the file you produced in question 3 so that the owner the group and others have read permissions only. Display the permissions after you made the change.

8. Using the `umask` command change the default permission setting to `–rw-------`. Then produce a new file named `test` and list the permissions of this file. Include the output of your list command into your solution document.

9. Change the setting of `quote_demo` script you implemented in question 1 to `--wx--x--x` using `chmod`. Can you execute this script as the owner after this change? State why. Include the command you used in your solution document.

10. Type `who am i` and write the output you see to your solution document.

11. Generate a directory called `dir1` and set its permissions to `d--x------`. Next run the following command:

```
ls -l dir1
```

Write the output you get to your solution document. Explain the reason why you had that output.

12. Run the following command:

```
ls -ld dir1
```

Write the output you get to your solution document. Explain the reason why you had that output.

13. Change the permission setting of `dir1` to `dr-x------`. Next run the following command:

```
ls -l dir1
```

Write the output you get to your solution document. Explain the reason why you had that output. What is the difference between `ls -l` and `ls -ld` when you use it for a directory?

14. Set the permissions of `dir1` to `d-wx------`. Produce a file named `notes` under `dir1` using the `touch` command. Then `cd` back to the parent directory of `dir1`. Run the following command:

```
ls -l dir1/notes
```

Does it work? Explain the reason.

15. Change the setting of `dir1` to `d--x------`. Run the following commands:

```
echo "1" > dir1/notes
cat dir1/notes
cd dir1
touch notes2
```

Do they work? Explain the reasons why they work or they do not work.

16. Run the following command to find your group name:

```
id -g -n your_username
```

Change the permissions of file `notes` to `d---rwx---`. Now the file belongs to a user (i.e. you) and also belongs to a group that the owner belongs to. Which operations can you perform on this file

as the owner. Can you show the contents of this file using cat? Can you add text to this file? Explain why they work or do not work.

17. Write a single line command that finds the commands including the word `chmod` in your history.

18. Include the output of `!uniq` command. What does it print? Is it different from the output you obtained for question 17?

19. Include the output of `!?uniq` command. What does it print? Is it different from the output you obtained for question 17?

20. Do incremental word search in your history and find the third most recent occurrence of the word `dir1`. Explain how you find the third occurrence. Hint: You can use `Ctrl-r` followed by searching for `dir1` and then keep pressing `Ctrl-r`.