Munster Technological University

Computer Science Dept.

COMP6042 Operating Systems in Practice

Spring 2024

Lab 5

Date: Week-starting March 11**,** 2024 – your COMP1-group scheduled Lab-class.

- Attendance at your Lab class is strongly recommended.
- You may be asked show your lecturer your working questions.
- *For answering descriptive questions, we recommend **not to use cut & paste**; use **your own words**.*

- Login to your ***Linux Ubuntu V22.04.x LTS*** virtual machine.
- ***Download this*** pdf-document (in a folder created for this module and Lab class).
- ***Create & Open*** your solutions-file, ***answer*** the questions, ***save*** the file.
- Use the Snipping tool program, to copy extracts from your terminal session into your document, to support your questions' answers.
- This is a practice Lab. No Canvas Submission

Document as much as possible in your answers-document. Take snipping of the terminal showing the sequence of commands you type.

Before you start the questions:

- Create a directory (i.e. folder) in your ***home*** directory called ***Lab_5***.
- Therefore, open a terminal and then type:

```
cd ~
pwd
mkdir Lab_5
ls -l          ← Make sure you can see the directory Lab_5 in the list.
```

- Finally, close the terminal.

Question 1

*Create and run a **simple bash script** program. Describe the lines of the program.*

Do not forget to take snipping… and insert into your answers-document.

1. Open a terminal.
2. Change to your home directory by typing: **cd ~**
3. Change to the Lab_5 folder by typing: **cd Lab_5**
4. Check you are in the correct directory by typing: **pwd**
5. Using **nano**, create a file called ***MyProg1***.
6. Insert the following four lines:

```
cd /etc
cat timezone
echo                ← Display a blank line
tail -8 passwd
```

   [**Hint**: Type nano MyProg1 and then type the 4 lines]
7. Save the file.
8. Display the file by typing: **cat MyProg1**
9. Run the program by typing: **bash MyProg1**
10. For your sample program, above-listed, what is the impact of lines 1, 2 and 4? [~5 lines].
11. Close the terminal.

Question 2

*From the terminal, display the **root directory** (folder). Explore and describe specified sub-directories.*

Do not forget to take snipping… and insert into your answers-document.

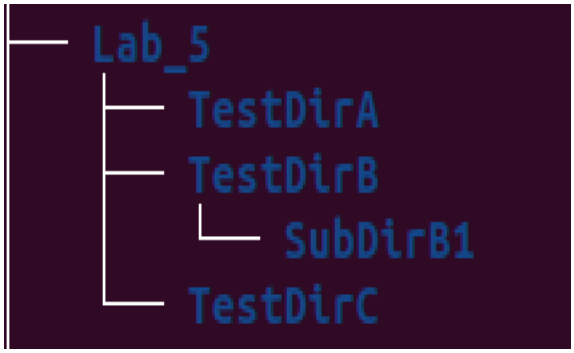
1. Open a terminal.
2. Change to your **root** directory by typing: **cd /**
3. Display the contents of this directory by typing: **ls**
4. Display the contents, of this directory, in more detail by typing: **ls -l**
5. Notice the ***swapfile***. What is the purpose of the swapfile? [Make reference to its size. ~3 lines]
6. Display the **/home** directory. What is the purpose of this directory? [~3 lines]
   [*Hint: Go to the /home directory. Display the contents. Your answer should give an example of a user.*]
7. Display the **/bin** directory. What is the purpose of this directory? [~3 lines]
   [*Hint: Go to the /bin directory. Display the contents. Support your answer with one example.*]
9. Display the **/etc** directory. What is the purpose of this directory? [~4 lines]
   [*Hint: Go to the /bin directory. Display the contents. Support your answer with two examples.*].

10. Close the terminal.

Question 3

*From the terminal **create directories.** Verify the directory tree structure that you created.*

1. Open a terminal.
2. Change to your home directory by typing: **cd ~**
3. Change to the Lab_5 directory: **cd Lab_5**
4. Check that you are in the correct directory by typing: **pwd**
5. Now create the follow set of directories and subdirectories in Lab_5



[Hint: to create the directory TestDirA, you must use the mkdir command by typing **mkdir TestDirA**]

6. Clearly show that you have created the directories properly by typing:

   cd ~

   tree Lab_5

   [Hint: If the ***tree*** command does not work, you will have to download it, via apt, i.e. **sudo apt update** and **sudo apt install tree**]

7. Close the terminal.

Question 4

*From the terminal, examine the **passwd file...** [Use slides of Chapter 03 from Canvas]*

1. Open a terminal.
2. Type the following commands:

   tail -3 /etc/group

   tail -3 /etc/passwd

3. Describe the functionality of the ***tail*** command. [~3 lines]

   [Hint: to see the manual for the tail command, type **man tail**]

4. What is the purpose of the **group** file? [~2 lines]
5. What is the purpose of the **passwd** file? [~2 lines]
6. Explain the ***fields*** of the last line of the **group** file. [~3 lines]
7. Explain the ***fields*** of the last line of the **passwd** file. [~6 lines]
8. Close the terminal.

Question 5

*From the terminal, **environment variables...***

1. Open a terminal.
2. Type: **env** to display a long list of environment variables.
3. Type: **echo "$USER"** to display the current value of the USER environment variable.
4. Type: **echo "$PWD"** to display the current value of the PWD environment variable.

5. Type: **cd ~/Lab_5**
6. Now write a ***bash shell program***, called *MyProg2,* that will display 4 different environment variables.
   [Hint: Create the program with **nano MyProg2** Then type 4 lines, save the file, and run the file using **bash MyProg2**]
7. Describe each of the environment variables displayed by your program.
8. Close the terminal.

Question 6

*Command line **operators***

Do not forget to take snipping… and insert into your answers-document.

1. Identify, and in your own words briefly describe the functionality of, the following Linux operators: **|**, **>** and **>>**

2. Type: **cd ~/Lab_5**
3. Type the command: **tail -12 /etc/group | sort >> Result.txt**
4. Explain, in your own words, what this command, Line 3 above, is doing. Show snippings to help your explanations. [Hint: If you type **ls** you will see a new file created…]
5. Close the terminal.

End Lab 05