OS1 Lab 5.2 - Linux Review Exercises

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The purpose of this lab activity is to give you an opportunity to review and practice much of the lab material you have learned over the last four weeks. This lab sheet contains more exercises than usual in order to give you a comprehensive understanding of the various linux commands and concepts. Please complete all the exercises below using the Google Cloud Shell Linux Terminal. Several of the exercises will require you to use command switches that you do not know - you are expected to look up the manual pages of any command you are unfamilar with to find out the purpose of the command and to determine the switch(es) you need to perform the exercise. Many hints are provided along the way to assist you.

## File Permission Exercises

In this section, you will complete exercises to create a file and modify the file’s permissions.

1. Create a new file called **text.txt** using the touch command .
2. What are the permissions of the file **text.txt**?

* answer:

Please complete the following exercises to change the permissions of the file **text.txt** using the command sequence chmod mode filename where mode is created by concatenating characters from *who*, *opcode* and *permission*. Please write the commands you used as your answer:

1. Allow the owner read access to the file and deny everyone else access to the file.

* answer:

1. Allows the owner and world to read the file but deny all access to the group.

* answer:

1. Deny access to the file for the owner, group and world.

* answer:

1. Grant the owner read and write access and grant the group and world read only access.

* answer:

Please complete the following exercises to change the permissions of the file **text.txt** using the command sequence chmod octal-mode filename where *octal-mode* is created by concatenating three digits from 0 to 7 inclusive. Please write the commands you used as your answer:

1. Allow the owner read access to the file and deny everyone else access to the file.

* answer:

1. Allows the owner and world to read the file but deny all access to the group.

* answer:

1. Deny access to the file for the owner, group and world.

* answer:

1. Grant the owner read and write access and grant the group and world read only access.

* answer:

## File and Text Exercises

Create a file called **capital.txt** with the following five lines:

Dublin is the capital city of Ireland.  
Ireland is viewed as the best country in the world by many people.  
Dublin has a population greater than 1 million people.  
There are many places to see and visit in Dublin.  
The largest university in Ireland is TU Dublin.

Create a second file called **cities.txt** with the following contents:

Dublin  
Cork  
Belfast  
Galway  
Waterford  
Kilkenny

Please complete the following exercises and write the commands you used as your answer:

1. Display the cities in the **cites.txt** file in reverse sorted order.

* answer:

1. Create a new file called **sortedcites.txt** that contains the cities in **cites.txt** in sorted order. Hint: *Use the sort command and redirection*.

* answer:

1. Display just the last two lines in the file **capital.txt**. Hint: *Use the tail command*.

* answer:

1. Display just the first three lines in the file **capital.txt**. Hint: *Use the head command*.

* answer:

1. Display just the lines in the file **capital.txt** that contain the word Dublin. Hint: *Use the grep command*.

* answer:

1. Display just the lines in the file **capital.txt** that contain the word dublin case-insensitive.

* answer:

1. Display just the lines in the file **capital.txt** that **do not** contain the word dublin case-insensitive.

* answer:

1. Display just the count of the lines in the file **capital.txt** that **do not** contain the word dublin case-insensitive.

* answer:

1. Display just the line number(s) in the file **cities.txt** that contains the word cork case-insensitive.

* answer:

1. Display just the first character of each line in the file **cities.txt**. Hint: *Use the cat and cut commands with piping*.

* answer:

1. Display just the second last line of the file **capital.txt**. Hint: *Use the cat, tail and head commands with piping*.

* answer:

1. Display a listing in long format of all files in the current working folder whose filenames begin with the letter k and end with the extension .txt

* answer:

1. Write the command that would run the program myprogramme, discarding all output generated to the null device.

* answer:

1. Display the output of the command ps -aux *both* to the screen *and* redirect the stdout to the file **processes.txt**

* answer:

1. Append the string “test” to the file **/etc/passwd** redirecting all error messages to the file **error.txt** in the current folder. Hint: *Use the echo command with redirection*.

* answer:

1. Delete the file **/etc/passwd** (without prompting the user for confirmation) redirecting all error messages generated by appending them to the file **error.txt** in the current folder.

* answer:

1. The command seq generates a sequence of numbers. For example, the command seq 5 generates a sequence of numbers from 1 to 5. Try it out for yourself.
   1. Create a new file called **numbers.txt** with the sequence of numbers from 1 to 4 each on a separate line. Hint: *Use the seq command with redirection*.
   * answer:
   1. Now, using one command, appended the sequence numbers from 1 to 6 to the end of the file **numbers.txt**., each number on a separate line.
   * answer:
   1. Display the contents of the file **numbers.txt** sorted in ascending order.
   * answer:
   1. Display the contents of the file **numbers.txt** sorted in ascending order, with duplicates removed. Hint: *Use the cat, sort and uniq commands with piping*.
   * answer:
   1. Display how many times each line is duplicated in the file **numbers.txt**.
   * answer:
   1. Display only the unique (non-duplicate lines) in the file. **numbers.txt**.
   * answer:

## Exercises on Processes

1. Start five processes in the background as indicated below:

* $ sleep 1000 & P1  
  $ sleep 2000 & P2  
  $ sleep 3000 & P3  
  $ sleep 4000 & P4  
  $ sleep 5000 & P5
* Please complete the following exercises, and write the commands and/or keystrokes you used as your answer.

1. Terminate process P1 without using the kill command.

* answer:

1. Identify the process identifier (PID) of process P2.

* answer:

1. Terminate process P2 using the kill command.

* answer:

1. Suspend process P3.

* answer:

1. Bring process P4 to the foreground and then terminate it.

* answer:

1. Terminate process P5 by force using the kill command.

* answer:

1. Terminate process P3 without using the kill command.

* answer: