**LINUX EXERCISE (LAB 04)**

Exercise 1. Basic operations

1. Run the top command while undertake other tasks
2. Run ps command
3. Read the manual of ps to know how to list all running processes. Try it yourself.
4. Run “find /.” What will happen? Stop the command
5. In the graphical mode, run the xclock program as a foreground process. Switch it to a background process. Stop the program by the kill command.
6. Run xcalc as a background process. Which information will appear on your terminal?
7. What does “kill -9 -1” command do?
8. Open two different terminals and use the write command to send a message from a terminal to another one
9. Run the dmesg command. What will appear on your screen? How to view the content of each page?
10. Show the running period (how long) of ls command to show all files of a directory.
11. Based on your processes in /proc (UID), how to find the running processes
12. How long has your OS run? Show it.
13. Which terminal (TTY) is yours?
14. Name two commands use mode SUID. Explain why these commands need this mode
15. Name the most resource-consumed commands in your system (use the most CPU and RAM)

Exercise 2. Advanced operations

1. Save your home directory to a tar file. Compress that file by using gzip command. Un-compress and extract the compressed file using car, tar and gzip (only single command line)
2. Use find to list all directories in your file system, saving them all to a file named directories.txt and errors (if had) to file named errors.txt.
3. Try the command “sleep 5”. What does it do?
4. Run “sleep 15” as a foreground process and stop it by using the Ctrl+Z combination, then resume it as a background process. Type jobs and then ps. Switch the background process to the foreground one.
5. Run “sleep 15” as a background process and then terminate the process by the command “kill”.
6. Run “sleep 15” as a background process and then stop the process by the command “kill”. Use the “bg” command to resume the stopped process
7. Run some background processes by using command “sleep 60”. Terminate all of those processes by a single command (pkill).
8. Use ps, w and top commands to show the running processes
9. Use “ps -aeH” to display the process hierarchy. Look for the init process. See if you can identify important system daemons. Can you also identify your shell and its subprocesses?
10. Combine ps -fae with grep to show all processes that you are executing, with the exception of the ps -fae and grep commands.
11. Start a sleep 300 process running in the background. Log off the server, and log back in again. List all the processes that you are running. What happened to your sleep process? Now repeat, except this time start by running nohup sleep 300.
12. Multiple jobs can be issued from the same command line using the operators ;, && and ||. Try combining the commands cat non-existent and echo hello using each of these operators. Reverse the order of the commands and try again. What are the rules about when the commands will be executed?
13. What does the xargs command do? Can you combine it with find and grep to find yet another way of searching all files in the /home subdirectory tree for the word hello?
14. What does the cut command do? Can you use it together with w to produce a list of login names and CPU times corresponding to each active process? Can you now (all on the same command line) use sort and head or tail to find the user whose process is using the most CPU?