Section 11 Lab
LPIC-1, Exam 1 (101-500)
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Recommended Linux Distributions for this exercise:

- CentOS version 7
- Ubuntu Desktop 18.04LTS

Note: For a successful lab session, it is assumed you are using the recommended Linux distribution(s) and the recommended version, and that your Linux systems are booted. In addition, it is assumed that you can log into the system as a standard user as well as either the root account or a user with super user privileges. Also, you should have successfully completed the prior sections' labs and sessions & viewed this section's videos.

Follow these actions to explore concepts and commands covered in this section (but please feel free to explore as much as you want. And don't forget that you can get help on the usage of these commands through the man pages. Type in **man** and follow it with the utility name, then press Enter to view information on the utility):

1. Log into either your Ubuntu or CentOS distro tty2 terminal, using the username and password you created when you installed the system.
2. Take a look at your processes by typing **ps** and pressing Enter.
3. View all the processes on the system using Unix options, by typing **ps -elf** and pressing Enter.
4. View all the processes on the system using BSD options, by typing **ps aux** and pressing Enter.
5. Look at the system's RAM (memory) usage, by typing **free** and pressing Enter.
6. Look how long the system has been up and running by typing **uptime** and pressing Enter. Notice that the processor load averages are also provided by this command.
7. Now, look at the interactive display of the system by typing **top** and pressing Enter. Try to find the RAM (memory) usage, system up time, and processor load averages in the display.
8. When you are done viewing the information displayed by the **top** utility, press the **q** to quit the utility and return to the command line.
9. Start the **sleep** program running, by typing **sleep 9000** and pressing Enter. (You will NOT get a command-line prompt back).
10. Before you get a command-line prompt, stop the **sleep** program by pressing the **Ctrl+Z** (lowercase Z) key combination This will stop the program, and provide a message similar to: [1]+ Stopped sleep 9000 The number in the brackets is the job number.
11. Move the sleep job into the background by typing **bg *job#*** and pressing Enter. (Don't actually type ***job#*** , but instead type in the number in brackets you saw in the previous step.)
12. View the jobs running in the background, by typing **jobs** and pressing Enter.
13. View the jobs running in the background along with their process IDs, by typing **jobs -l** (lowercase L) and pressing Enter.
14. Start a job in the background by typing **sleep 8000&** and pressing Enter.
15. View the jobs running in the background along with their process IDs, by typing **jobs -l** (lowercase L) and pressing Enter.
16. Bring the **sleep 8000** job back into the foreground, by typing **fg *job#*** and pressing Enter. (Don't actually type ***job#*** , but instead type in the number in brackets you saw for this background job in the previous step.)
17. Stop this job and make it unable to be restarted in the background by pressing the **Ctrl+C** (lowercase C) key combination.
18. View the job running in the background along with its process ID, by typing **jobs -l** (lowercase L) and pressing Enter.
19. Stop (kill) the process running in the background by typing **kill *PID#*** and pressing Enter. (Don't actually type ***PID#*** , but instead type in the PID number you saw for this background job in the previous step.)
20. Start another job in background by typing **vi&** and pressing Enter.
21. View the jobs running in the background, by typing **jobs** and pressing Enter.

22. Stop (kill) the process running in the background by typing **kill -9 %*job#*** and pressing Enter. (Don't actually type ***job#***, but instead type in the job number you saw in brackets for this background job in the previous step.) The **-9** sends the highest kill signal to the job.
23. Start a processing running in the background with a lower priority, by typing **nice -n 10 vi&** and pressing Enter. (Remember that a higher nice number means a lower priority.)
24. View your processes and their nice values by typing **ps -l** (lowercase L) and pressing Enter. Notice the nice value for the **vi** job running (actually its stopped) in the background. Record that process' PID.
25. Change the nice value for the **vi** job running in the background, by typing **renice -n 15 *PID#*** and pressing Enter. (Remember you can only lower the priority of a process, if you do not use super user privileges.)
26. View your processes and their nice values by typing **ps -l** (lowercase L) and pressing Enter. Notice the new nice value for the **vi** job running (actually its stopped) in the background.
27. Using the proper command, kill the process running in the background that has the modified nice value (priority). (Hint: Most likely the default kill signal will NOT work.)