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Com S 352 – Operating Systems
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Assignment 3

Question 1:
Why are two modes (user and kernel) needed? What is the difference between an interrupt and a trap?

Answer:

Two modes are needed because the user shouldn't be able to run privileged instructions that the kernel mode can. Users running a program could potentially access and/or delete data that is critical for the OS to function properly.

An interrupt is generated by hardware and are random. A trap is an exception that occurs from a users program.

Question 2:

Answer:

1. READY to RUN – The is done when a process is in main memory and the CPU is made ready to run it by the dispatcher.
2. RUN to READY – This is done when a process's time splice is ended and it is moved back to main memory to wait until it's turn arrives.
3. RUN to BLOCKED – this is done when an I/O request is made.
4. BLOCKED to READY – This is done when the requested I/O is completed.
5. READY to NONRESIDENT – This is done when memory is overloaded.
6. BLOCKED to NONRESIDENT – this is done when memory is loaded back onto the disk.

Question 3:
Explain what the following options will do when used with ps:

- **ps -e**
- **ps -l**

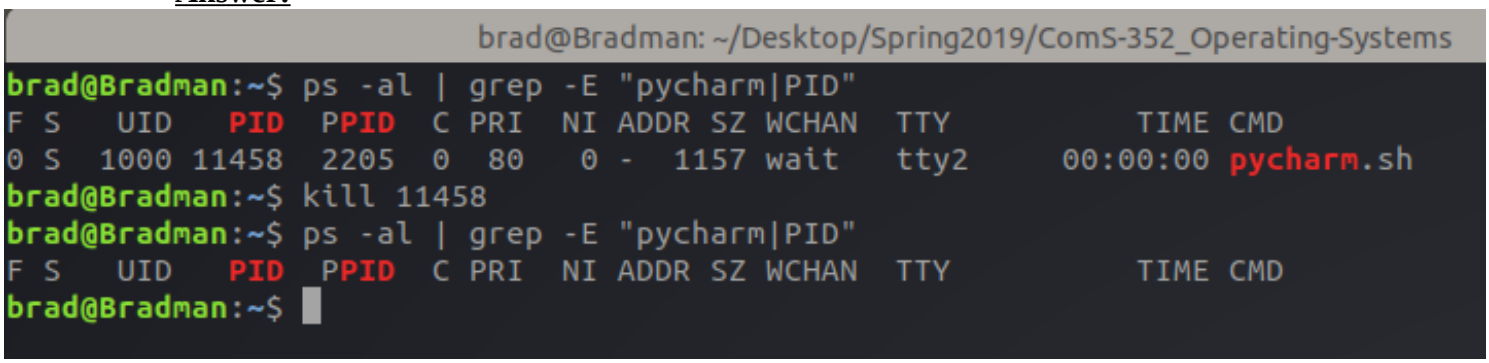
Answer:

ps -e is used to see every process running on the system
ps -l is used for "Long Format" which shows more information about the process.

Question 4:

Combine ps with grep to get the PID of a process (e.g. FireFox). Then, use the kill command to send a SIGTERM signal to that process.

Answer:



Question 5:

How many times message "Both parent and child reach here" will be printed?

Answer:

"Both parent and child reach here" is printed a total of 2 times, once for the child process and once for the parent.

Question 6:

Explain what the command pstree does.

Answer:

pstree displays a tree of the running processes on the system. This is useful in showing what processes are parents and children.