COMP 304 – ASSIGNMENT 1

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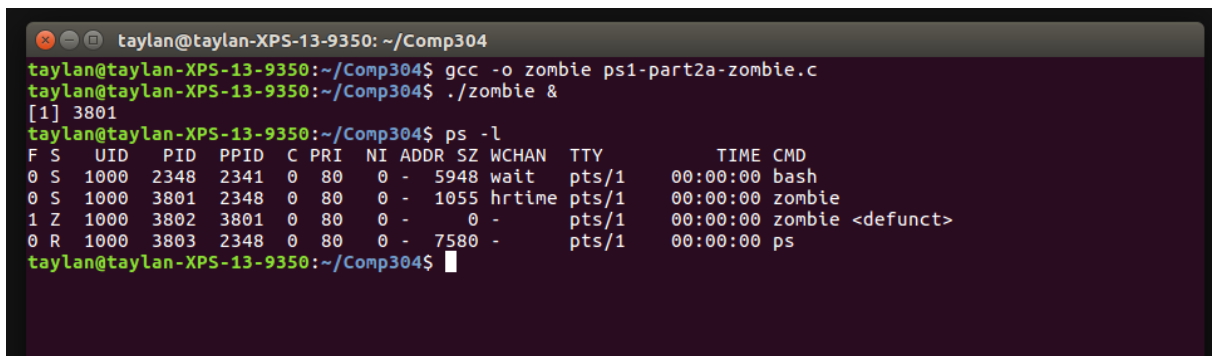
Problem 1

a) System calls provide a way for programs to request services from OS. Kernel-level operations are cricital, so programmers use API instead of directly invoking system calls to avoid corrupting the components of the system.

b) In non-loadable kernel module systems, all functionality have to be loaded into the kernel even if they will not be used. This creates a waste of memory. Loadable kernel modules enable us adding and removing functionalities without needing to rebuild the kernel.

c) - Advantages of a multiprogramming and time-sharing environment:

- Programs run concurrently, even if number of CPU cores is less than the number of running programs.
- CPU utilization is improved, cores are used more efficiently.

- If several users share the system simultaneously, a user may read or corrupt the private data of another user. To avoid this, OS should fairly share the sources of the computer for programs and limit sharing of data between different programs. One-way pipes is an example of more secure communication. The processes must have a common parent process to be able to use pipes.

Snapshots of Sample Runs

Problem 2

a)

b)

Problem 3

Problem 4

a)

b)