CIT 250 Homework 1 - Overview **SOLUTIONS**

1. (2pts) What is an operating system?

   The book provides both "A program that acts as an intermediary between a user of a computer and the computer hardware" and "Everything a vendor ships when you order an operating system". I also used "Running software which serves an an intermediary between user software and a computers hardware, along with support software" in class. Anything that seems to reasonably include any OS you can think of, but nothing that isn't an OS, is fine.

2. (2pts) What is the difference between user mode and kernel (or system) mode?

   Kernel (or system) mode provides unrestricted access to the hardware and all of memory. Processes in user mode are more constrained, and can only access some functionality by making a call to kernel-mode software.

3. (2pts) What is the purpose of a hardware interrupt?

   A hardware interrupt is used to signal that a piece of hardware needs attention from the CPU / operating system.

4. (2pts) What is the purpose of a system call?

   System calls allow (user mode) software to request functionality from the operating system.

5. (6pts) Name, and briefly describe, three activities that might require system calls.

   Here are some examples. Others are fine.

   Create process - Request that the OS create a new process, possibly a duplicate of the current one.

   Wait for time - Request that current process be put to sleep until some time in the future

   Open file - Attempt to open a file, and set up necessary support information

   Set time - Update the current system time

6. (2pts) What is the purpose of system programs?

   System programs provide a more convenient way of interacting with system functionality, often by providing an interface to system calls.