Answers for Week 2 Questions

A1: Multiprogramming or time-sharing refers to multiple users sharing access to a computer. In multitasking, we refer to execution of several tasks simultaneously within a computer.

A2: The operating system interacts with the user by using a *user interface*. This user interface can either be command line interface *(shell)* or graphical interface *(GUI)*.

A3: Kernel is the core component of an operating system. It enables multiple applications to share hardware resources by providing access to CPU, memory, disk and networking. Examples: File manager, device drivers, memory manager, dispatcher & scheduler, directory path.

A4: When there is no memory left in the primary memory (RAM), it can sometimes lend some space from the secondary memory. That is called virtual memory.

A5: With the help of a software called *firmware*. An example would be BIOS which is short for *Basic Input Output System*. Firmware provides hardware initialization during the *booting_process*.

A6: Context switch is the process where CPU changes its attention from process to process, which allows multiple processes share a single CPU and provide multitasking.

A7: Concurrency relates to an application which is processing more than one task at a time. It creates the illusion of parallelism, however it is done on a single CPU by context switching. Parallelism relates to an application where tasks are divided into sub-tasks and processed in parallel in different processors.

So in concurrency, different tasks are being processed by a single processor. In parallelism, a task is divided into sub-tasks are processed in parallel in difeferent processors.

A8: When we start the computer, we need a program to call the OS. That is called *boot loader*. Since ROM is a non-volatile storage, boot loader is stored in ROM. The contents of the ROM cannot be modified. *Booting* is the process of running the boot loader and starting the operating system.