Operating systems reading assignment number 1

1) What are two main main functions of an operating system

   The two main functions of an operating system are providing abstractions to user programs and managing the computer resources.
2) Difference between time sharing and multiprogramming?

   - In time sharing there is a list of threads at different priorities and when the cpu is ready to take on a new thread it picks the thread with the highest priority.
   - Multiprogramming is different here several threads are run in parallel, meaning at the same time.

3) The family of computers idea was introduced in the 1960s with the IBM system/360 mainframes. Is the idea now dead as a doornail or does it live on?

   This idea still lives on today, as mentioned in the book the descendants of these machines are still being used today in computer centers.

4) What is the difference between kernel and user mode? Explain why having the two distinct mode help in creating operating systems

   Kernel mode has the least restrictions the cpu has full access to memory and io, the user mode on the other hand is more restricted has access to a much more restricted set of instruction and memory

5) It makes multiprogramming less effective at what it does best, because the cpu cant work on other processes when input output is being executed.
6) In fairness each process should have a fair amount of resources at its disposal, in real time resources are allocated depending on when the process must be completed

7) Delete all interrupts and change the memory map are done in kernel mode.
8) Consider a system that has two CPUs, each CPU having two threads (hyperthreading). Suppose three programs, P0, P1, and P2, are started with run times of 5, 10 and 20 msec, respectively. How long will it take to complete the execution of these programs? Assume that all three programs are 100% CPU bound, do not block during execution, and do not change CPUs once assigned.

   It will take 30 msec to complete

9) What is a trap instruction? Explain its use in operating systems.

   It's a procedure call that synchronously transfer controls

   It's used to send system calls, by trapping the kernel

10) Modern operating systems decouple a process address space from the machine’s physical memory. List two advantages of this design.

It helps run large size programmes so even if the programme is larger than the machine memory size, it can be ran.

The programme is loaded in different parts of the machine’s memory