**Week1 Questions**

1. What are the three main purposes of an operating system?
2. What is the main difficulty that a programmer must overcome in writing an operating system for a real-time environment?
3. In a multiprogramming and time-sharing environment, several users share the system simultaneously. This situation can result in various security problems.
   1. What are two such problems?
   2. Can we ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain your answer.
4. What is the purpose of interrupts? How does an interrupt differ from a trap? Can traps be generated intentionally by a user program? If so, for what purpose?
5. Define the following: multiprogramming, multitasking, and multiprocessing
6. Distinguish the terms: interrupt, trap (system call), and mode bit.
7. Give two reasons why caches are useful. What problems do they solve? What problems do they cause? If a cache can be made as large as the device for which it is caching (for instance, a cache as large as a disk), why not make it that large and eliminate the device?
8. Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems?
9. Many SMP systems have different levels of caches; one level is local to each processing core, and another level is shared among all processing cores. Why are caching systems designed this way?