

Operating System

Problems on Introduction to Operating Systems

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Problem set #1 (Note: Try to complete as many as you can do, but at least 70% of these be completed and submitted in class in hand-written form.)

1.
 - 1.1 What are the three main functions of an operating system?
 - 1.2 List two advantages of batch processing operating systems.
 - 1.3 List two advantages of multi-programming operating systems.
 - 1.4 List advantages of time-sharing operating system.
 - 1.5 What are the main challenges of for the programmer to write an operating system for a real-time environment?
2. Which of the following instructions should be privileged Instructions?
 - 2.1 Set the value of Timer.
 - 2.2 Read the value from memory.
 - 2.3 Clear memory.
 - 2.4 Issue a trap instruction.
 - 2.5 Turn off interrupts.
 - 2.6 Modify entries in device-status table.
 - 2.7 Switch from user to kernel mode.
 - 2.8 Access an I/O device.

Problem set #2

1. Some early computers protected the operating system by placing it in a memory partition that could **not** be modified by either the user job or the operating system itself. Describe two difficulties that you think could arise with such a scheme.
2. In a *multiprogramming* and *time-sharing* environment, several users share the system simultaneously. This situation can result in various *security problems*.
 - 2.1 What are the two such problems?
 - 2.2 Can we ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain.
3. Under what situations would a user be better off using a time-sharing system than a PC or a single-user workstation?
4. Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other user or other programs.
5. Describe some of the challenges of designing operating systems for mobile devices compared with designing operating systems for traditional PCs.