Assignment 1

COM S 352

Due: January 19, 2018

1.12 In a multiprogramming and time-sharing environment, several users share the system simultaneously. This situation can result in various security problems.

a. What are two such problems?

b. Can we ensure the same degree of security in a time-shared machine as in a dedicated machine? Explain your answer.

1.14 Under what circumstances would a user be better off using a timesharing system than a PC or a single-user workstation?

1.15 Describe the differences between symmetric and asymmetric multiprocessing. What are three advantages and one disadvantage of multiprocessor systems?

1.19 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?

1.20 Direct memory access is used for high-speed I/O devices in order to avoid increasing the CPU's execution load.

a. How does the CPU interface with the device to coordinate the transfer?

b. How does the CPU know when the memory operations are complete?

c. The CPU is allowed to execute other programs while the DMA controller is transferring data. Does this process interfere with the execution of the user programs? If so, describe what forms of interference are caused.

2.13 Describe three general methods for passing parameters to the operating system.

2.15 What are the five major activities of an operating system with regard to file management?

2.16 What are the advantages and disadvantages of using the same systemcall interface for manipulating both files and devices?

2.18 What are the two models of interprocess communication? What are the strengths and weaknesses of the two approaches?