CMP 426/697 Homework 1 Fall 2019

Due date: September 19, 2019 by 11:59 pm on Blackboard.

Late homework submission will not be allowed.

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

2. 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.

3. Describe a mechanism for enforcing memory protection in order to prevent a program from modifying the memory associated with other programs.

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

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

6. What is the main advantage of the microkernel approach to system design? How do user programs and system services interact in a microkernel architecture? What are the disadvantages of using the microkernel approach?