Homework 2

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CS 5523

1. The main benefits of using a microkernel design are that it is easier to extend, easier to port to newer architectures, more reliable, and more secure. User programs and system services interact through message parsing. The main disadvantage is the performance overhead of user space to kernel space communication.
2. During a context switch, the OS saves the stack pointer and process control of the current executing process, and transfers control to the clock interrupt handler. Then, the clock interrupt handler saves the remaining registers and machine states in the PCB. After that, it invokes the scheduler to determine which process executes next. Finally, the OS retrieves the next process state from its PCB and restores the registers.
3. In shared memory, memory can be simultaneously accessed by multiple processes. This allows all processes to communicate with each other. Message passing allows processes to communicate without sharing variables, but the communication is slower.