CSS-430 : Operating Systems : HW06-Questions

David Liu

**Assignment Text**

Question: In Section 6.4, we mentioned that disabling interrupts frequently can affect the system’s clock. Explain why this can occur and how such effects can be minimized.

The clock can easily lose the correct time if interrupts were disabled since the system clock is updated at every clock interrupt. The scheduler also relies on interrupts to set quantum’s for processes. The effects can be minimized by disabling clock interrupts for short periods of time.

6.2

Question: What is the meaning of the term busy waiting? What other kinds of waiting are there in an operating system? Can busy waiting be avoided altogether? Explain your answer.

Busy waiting is waiting for a process to finish a loop w/o giving away the processor. A process could wait by giving away the processor for a period of time when the process is blocked and later be awakened.

6.3

Question: Explain why spinlocks are not appropriate for single-processor systems yet are often used in multiprocessor systems.

Multiprocessor systems use other processors to modify another programs state to release the process from a spinlock. Single-processor systems do not have that capability.

6.5

Question: Illustrate how a binary semaphore can be used to implement mutual exclusion among n processes.

The semaphore can be initialized to 1 to simulate a mutex.

sem\_t gMutex;

while(true) {

wait(gMutex);

# Critical Section

signal(gMutex);

# The rest

}