CS 314 Operating Systems, Spring 2022
Quiz #3 on February 15, 2022

List of the possible questions

#1: What do “sufficient conditions” guarantee?

#2: What do “necessary conditions” guarantee?

#3: If a sufficient condition is not satisfied, what conclusion can we draw?

#4: If a necessary condition is satisfied, what conclusion can we draw?

#5: Describe how “micro-kernel architecture” and “non micro-kernel architecture” are different in how system calls issued by user applications will be executed.

#6: What are the advantages in using “micro-kernel architecture”? What is the primary disadvantage in “micro-kernel architecture”?

#7: How does “FCFS” process scheduling algorithm work?

#8: How does “RR” process scheduling algorithm work?

#9: How does “SJF” process scheduling algorithm work?

#10: How does “SRTF” process scheduling algorithm work?

#11: What is “preemptive process scheduling”?

#12: What is “non-preemptive process scheduling”?

#13: What are the two processor modes operating systems set?

#14: What is “kernel (system) mode” of a processor?

#15: What are “system calls”?

#16: What is “user mode” of a processor?

#17: Why do operating systems have two processor modes (what problems will happen if there is no “user mode” – all programs run in the kernel (system) mode)?

#18: What is “race condition”? 

1
#19: How can “race condition” happen? Show “how” using an example.

#20: What is “critical section”?

#21: What is “mutual exclusion”?

#22: What does “atomic” in “atomic operations” mean?

#23: What is “a binary (or mutex) semaphore”?

#24: What are the two primary system calls for manipulating a semaphore?

#25: Explain how a semaphore can prevent race condition.

#26: What are the two operations of a semaphore (just name them)?

#27: What “wait” system call to a semaphore exactly performs?

#28: What “signal” system call to a semaphore exactly performs?

#29: Why are the two system calls for semaphores (“wait” and “signal”) must be atomic operations (explain the reason)?

#30: What are “counting semaphores” (how are “counting semaphores” different from “binary (mutex) semaphores”)?

#31: Who manages semaphores?

#32: Operating systems use “queue (FIFO data structure)” for managing processes blocked on a semaphore. Why is FIFO-queue used (the best reason for using FIFO structure)?