


A+ will be down for a version upgrade on Tuesday 03.01.2023 at 9-12.

This course has already ended.

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/ 7.1 Synchronization

Synchronization

Exercise 1

 The deadline for the assignment has passed (Sunday, 27 November 2022, 23:59).

Synchronization

1. Review questions. Please consult Chapters 5 & 6 from "Operating Systems - Internals and Design Principles" by William Stallings

Question 1 2 / 2

Which of the following design issues is the concept of concurrency relevant to?

- ☒ communication among processes
- ☒ sharing of and competing for resources
- ☒ synchronization of the activities of multiple processes
- ☒ allocation of processor time to processes

✓ Correct!

Question 2 2 / 2

Which of the statements are true about competing processes and cooperating processes?

- ☐ cooperating processes need access to the same resource at the same time, such as a disk, file, or printer.
- ☒ competing processes need access to the same resource at the same time, such as a disk, file, or printer.

- ☒ **cooperating processes either share access to a common object, such as a memory buffer or are able to communicate with each other**
 - ☐ competing processes either share access to a common object, such as a memory buffer, or are able to communicate with each other
- ✓ Correct!

Question 3 2 / 2

Which are the control problems associated with competing processes?

- ☐ resource preemption
- ☒ **deadlock**
- ☒ **starvation**
- ☐ hold-and-wait

✓ Correct!

Question 4 2 / 2

What is true about binary and general semaphores?

- ☐ a general semaphore can have any float values
- ☒ **a general semaphore can have any integer values**
- ☐ a binary semaphore may only take on the values true and false
- ☒ **a binary semaphore may only take on the values 0 and 1**

✓ Correct!

Question 5 2 / 2

What is true about a mutex and a binary semaphore?

- ☒ **the process that locks a mutex must be the one to unlock it**
- ☒ **for a semaphore, if the operation wait(s) is executed by one process, the operation signal(s) can be executed by any process**
- ☒ **multiple number of threads can acquire a binary semaphore at the same time concurrently**

✓ Correct!

Question 6 2 / 2

Which characteristics of monitors mark them as high-level synchronization tools?

- ☐ threads
- ☒ **condition variables**
- ☒ **locks**

✓ Correct!

Question 7 2 / 2

What is true about direct and indirect addressing with respect to message passing?

- ☐ with indirect addressing, the send primitive includes a specific identifier of the destination process
- ☐ with direct addressing, messages are sent to a shared data structure consisting of queues that can temporarily hold messages
- ☒ **in direct addressing, the process must know ahead of time from which process a message is expected**

✓ Correct!

Question 8 2 / 2

What conditions are generally associated with the readers/writers problem?

- ☒ **any number of readers may simultaneously read the file**
- ☐ any number of writers may simultaneously write to the file
- ☐ while a writer is writing to the file, a reader may read it
- ☐ while a reader is reading the file, only one writer may write to it

✓ Correct!

Submit

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