

COMP30640 Operating Systems: Quiz 7

Exercise 1

Describe the dining-philosophers problem and how it relates to operating systems.

Sample Solution 1

The scenario involves five philosophers sitting at a round table with a bowl of food and five chopsticks. Each chopstick sits between two adjacent philosophers. The philosophers are allowed to think and eat. Since two chopsticks are required for each philosopher to eat, and only five chopsticks exist at the table, no two adjacent philosophers may be eating at the same time. A scheduling problem arises as to who gets to eat at what time. This problem is similar to the problem of scheduling processes that require a limited number of resources.

Exercise 3

Do resource cycles always lead to deadlock? Explain.

Sample Solution 2

No. If there are multiple equivalent resources, then a cycle could exist that wasn't a deadlock: The reason is that some thread/process that wasn't a part of the cycle could release a resource needed by a thread in the cycle, thereby breaking the cycle.