Akhinav Dinesh Srivatsa

21BDS0340

Operating systems

Question 1

1. The Bounded Buffer problem

This problem deals with a producer and consumer reading and writing to a limited sized buffer

A producer cannot write data when the buffer is full and a consumer cannot read data when the buffer is empty.

A simple wait() and signal() syntax can solve this with semaphores

2. The printer spooler Problem

This problem deals with a printer printing out files that are queued up.

A printer must decide to print only one file at a time, else documents can write on each other.

A simple wait() and signal() syntax with semaphores can solve this also.

3. The Dining Philosopher problem

This problem discusses a scenario where there is a round table with 5 philosophers and 5 forks in between them. A philosopher can be at 3 states: thinking, hungry and eating.

A philosopher in the thinking state does nothing, hungry: checks if both forks around him are availble to eat with, eating: using the 2 forks.

This resembles processes and requiring shared resources. This cannot be solved with only semaphores, but can be with monitors

4. The Readers writers problem

This problem is about accessing a database. A user can either be a reader or writer. Readers can just look at data and not modify anything. writers can modify the data though.

The solution can be done with semaphores alone by maintaining a lock when data is being modified

Question 2

First fit: The memory uses the first unused space that it can fit in

Best fit: The memory uses a free space with the least amount that can fit it

worst fit: The memory uses a free space with the most space available