Lamba Fatima
22K-5195
BSE-4B

Date:

Q Code workout 1

a) Producer = 83

b) Consumed = 83

...

b) The 'full' semaphore ensures that consumer waits when the buffer is empty, while the empty semaphore ensures that the producer waits when the buffer is full.

c) The Sleep() function in the producer & consumer functions simulates processing time, creating a pause between producing/consuming items to mimic real-world delays & make simulation more realistic.

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Code work out 2.

c) Dry Run

Reader Function:

1. Acquire the mutex semaphore
2. Increment the reader count
3. If it's the first reader. Lock the 'rw_mutex' semaphore to block writers
4. Release the mutex semaphore
5. Read from the file line by line & print each line.
6. Acquire the mutex semaphore.
7. Decrement the 'readers_count'
8. If it's the last reader, release the 'rw_mutex' semaphore to allow writers
9. Release the mutex semaphore
10. Sleep for a short duration.

Writer Function:

1. Acquire the 'rw_mutex' semaphore to ensure exclusive access to file
2. Initialize random seed
3. Generate a random string of characters.
4. Write random string to file & print it to console
5. Flush the file buffer to ensure writing is complete
6. Release the 'rw_mutex' semaphore to allow other writers or readers
7. Sleep for short duration

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d) i) This condition is not because readers acquire the mutex semaphore before checking if a writer is currently using shared object. If writer is waiting (rw mutex locked), readers can't increment the 'readers_count'.

ii) This condition is met bc writers acquire the 'rw-mutex' semaphore before writing to file. If writer is waiting to access object, no new readers may start reading because 'rw_mutex' is locked, preventing readers from accessing the file until writer finishes writing.

Teacher's Signature: