

SYSTEM SOFTWARE LAB

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TCR18CS056

S5, CSE

EXPERIMENT 6

PRODUCER-CONSUMER PROBLEM

AIM:

Implement the producer-consumer problem using semaphores.

THEORY:

In computing, the producer–consumer problem (also known as the bounded-buffer problem) is a classic example of a multi-process synchronization problem, proposed by Edsger W. Dijkstra.

The problem describes two processes, the producer and the consumer, who share a common, fixed-size buffer used as a queue.

The producer's job is to generate data, put it into the buffer, and start again.

At the same time, the consumer is consuming the data (i.e., removing it from the buffer), one piece at a time.

The problem is to make sure that the producer won't try to add data into the buffer if it's full and that the consumer won't try to remove data from an empty buffer.

The solution for the producer is to either go to sleep or discard data if the buffer is full.

The next time the consumer removes an item from the buffer, it notifies the producer, who starts to fill the buffer again. In the same way, the consumer can go to sleep if it finds the buffer empty. The next time the producer puts data into the buffer, it wakes up the sleeping consumer.

The solution can be reached by means of inter-process communication, typically using semaphores.

An inadequate solution could result in a deadlock where both processes are waiting to be awakened. The problem can also be generalized to have multiple producers and consumers.

RESULT

Producer-consumer problem was implemented with successful output.

OUTPUT :

Run these commands (Ubuntu):

```
gcc program.c -lpthread -lrt  
./a.out
```

```
shuaib@shuaib-pc:~/Documents/ss/apz/exp6$ gcc program.c -lpthread -lrt  
shuaib@shuaib-pc:~/Documents/ss/apz/exp6$ ./a.out  
Enter the Buffer size: 12  
  
-----Output-----  
  
Buffer space: 0  
Producer produced 3 items  
  
Buffer space: 3  
Producer produced 7 items  
  
Buffer space: 10  
Consumer consumed 4 items  
  
Buffer space: 6  
Consumer consumed 3 items  
  
Buffer space: 12  
shuaib@shuaib-pc:~/Documents/ss/apz/exp6$
```