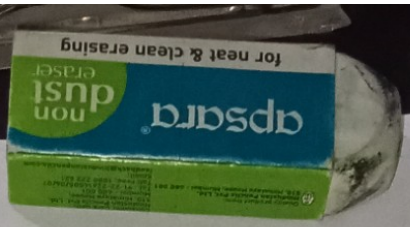

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★ Aim : Write a C program to stimulate the concept of Producer - Consumer Problem.

★ Learning objective :

To learn and understand the concept of objective producer, consumer problem using semaphores.

★ Theory :

The Producer - consumer problem is a classic problem this is used for multi - process synchronization i.e. synchronization between more than one processes.

In the producer - consumer problem, there is one producer that is producing something and there is one consumer that is consuming the products produced by the producer. The producers and consumers share the same memory buffer that is of fixed - size.

The job of the producer is to generate the data, put it into the buffer, and again start generating data. While the job of the consumer is to consume ~~the~~ the data from the buffer.

• Semaphore :

Semaphore is simply a variable that is non - negative and shared between threads. A semaphore is a signaling mechanism, and a thread ~~betwee~~ that is waiting on a semaphore can be signaled by another thread. It uses two atomic operations, 1) wait and 2) signal for the process synchronization.

A semaphore either allows or disallows access to the resource, which depends on how it is set up.

- Types of Semaphores:

The two common kinds of semaphores are: (a) Counting semaphores
(b) Binary semaphores.

(a) Counting Semaphores:

This type of semaphore uses a count that helps task to be acquired or released numerous times. If the initial count = 0, the counting semaphore should be created in the unavailable state. However, if the count is > 0, the semaphore is created in the available state, and the number of tokens it has equals to its count.

(b) Binary Semaphores:

The binary semaphores are quite similar to counting semaphores, but their value is restricted to 0 and 1. In this type of semaphore, the wait operation works only if semaphore = 1, and the signal operation succeeds when semaphore = 0. It is easy to implement than counting semaphores.

★ Conclusion:

We successfully learned and understood the concept of objective producer, consumer problem using semaphores.

Signal for the process synchronization.