

Ex. No.: 8

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PRODUCER CONSUMER USING SEMAPHORES

Aim:

To write a program to implement solution to producer consumer problem using semaphores.

Algorithm:

1. Initialize semaphore empty, full and mutex.
2. Create two threads- producer thread and consumer thread.
3. Wait for target thread termination.
4. Call sem_wait on empty semaphore followed by mutex semaphore before entry into critical section.
5. Produce/Consumer the item in critical section.
6. Call sem_post on mutex semaphore followed by full semaphore before exiting critical section.
7. Allow the other thread to enter its critical section.
8. Terminate after looping ten times in producer and consumer threads each.

Program Code:

```
#include < stdio.h >
#include < stdlib.h >
int mutex = 1, full = 0, empty = 3, x = 0;
int main()
{
    int n;
    void producer();
    void consumer();
    int wait(int);
    int signal(int);
    printf("1. Producer\n2. Consumer\n3. Exit");
}
```

```

while(1)
{
    printf("Enter your choice:");
    scanf("%d", &n);
    switch(n)
    {
        case 1: if((mutex==1) && (empty!=0))
                    producer();
                else
                    printf("Buffer is full !!");
                    break;
        case 2: if((mutex==1) && (full!=0))
                    consumer();
                else
                    printf("Buffer is empty");
                    break;
        case 3: exit(0);
        break;
    }
    return 0;
}

```

Output:

1. Producer
2. Consumer
3. Exit

Enter your choice : 1

Producer produces the item 1

Enter your choice : 2

Consumer consumes item 1

Enter your choice : 2

Buffer is empty !!

Result: The above commands are executed successfully

TRY.

5%