

PROGRAM NUMBER :7

***AIM:***

Implement the producer-consumer problem using semaphores.

## PROGRAM

```
ng@ng-TravelMate-5742:~/system$ cat producer-consumer.c
#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("\nEnter 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;
}
```

```

int wait(int s)
{
    return (--s);
}

int signal(int s)
{
    return(++s);
}

void producer()
{
    mutex=wait(mutex);
    full=signal(full);
    empty=wait(empty);
    x++;
    printf("\nProducer produces the item %d",x);
    mutex=signal(mutex);
}

void consumer()
{
    mutex=wait(mutex);
    full=wait(full);
    empty=signal(empty);
    printf("\nConsumer consumes item %d",x);
    x--;
    mutex=signal(mutex);
}

```

## OUTPUT

```

ng@ng-TravelMate-5742:~/system$ gcc producer-consumer.c
ng@ng-TravelMate-5742:~/system$ ./a.out
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:1

Producer produces the item 1
Enter your choice:1

Producer produces the item 2
Enter your choice:1

Producer produces the item 3
Enter your choice:1
Buffer is full!!
Enter your choice:2

```

```
Enter your choice:2
Consumer consumes item 3
Enter your choice:2
Consumer consumes item 2
Enter your choice:2
Consumer consumes item 1
Enter your choice:2
Buffer is empty!!
Enter your choice:1
Producer produces the item 1
Enter your choice:3
cc@cs:~/java1/Notes/5349:~$
```

## RESULT

Program is executed successfully and output is obtained.

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