

Ex. No. 8	PRODUCER CONSUMER USING SEMAPHORES
Date: 27.03.2025	

Aim:

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

Program:

```
#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>
#include <semaphore.h>
#define SIZE 3
int buffer[SIZE], in=0, out=0, count=0, item=0; sem_t
empty, full, mutex;

void *producer(){
    if(count==SIZE){
        printf("Buffer is full!!\n");
        return NULL;
    }
    sem_wait(&empty);
    sem_wait(&mutex);
    item++;
    buffer[in]=item;
    in=(in+1)%SIZE;
    count++;
    printf("Producer produces the item %d\n", item);
    sem_post(&mutex);  sem_post(&full);  return
    NULL;
}
```

```

void *consumer(){
    if(count==0){
        printf("Buffer is empty!!\n");
        return NULL;
    }
    sem_wait(&full);
    sem_wait(&mutex);    int
    data=buffer[out];
    out=(out+1)%SIZE;
    count--;
    printf("Consumer consumes item %d\n", data);
    sem_post(&mutex);    sem_post(&empty);
    return NULL;
}

int main(){
    sem_init(&empty,0,SIZE);
    sem_init(&full,0,0);
    sem_init(&mutex,0,1);    int
    choice;    while(1){
        printf("1.Producer\n2.Consumer\n3.Exit\nEnter your choice:");
        scanf("%d",&choice);    pthread_t t;
        if(choice==1) pthread_create(&t,NULL,producer,NULL);
        else if(choice==2) pthread_create(&t,NULL,consumer,NULL);
        else exit(0);    pthread_join(t,NULL);
    }
    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!!
Enter your choice:1
Producer produces the item 2
Enter your choice:1
Producer produces the item 3
Enter your choice:1
Producer produces the item 4
Enter your choice:1
Buffer is full!!
Enter your choice:3
```

Result:

The program to solve the producer-consumer problem using semaphores was executed successfully.