

Name: Maimoona Khilji

Program: BS-Data Science

Operating System – Lab 19

Task 1: Solve Producer and Consumer problem using binary semaphores

Code:

```
#include<pthread.h>
#include <iostream>
#include <cstdlib>
#include<semaphore.h>
using namespace std;
int counter=0,next_consumed=0,next_produced=0;
int buffer[1000];
int in=0;
int out=0;
int i=0,j=0;
int BUFFER_SIZE=100;
sem_t S;

void *producer(void *param){
    while (i<=2) {

        sem_wait(&S);
        /* produce an item in next produced */
        while (counter == BUFFER_SIZE)
            ;/* do nothing */
        buffer[in] = next_produced;
        in = (in + 1) % BUFFER_SIZE;
        counter++;
        cout<<counter<<" in producer"<<endl;

        i++;
        sem_post(&S);
    }
    pthread_exit(NULL);
}
```

Name: Maimoona Khilji

Program: BS-Data Science

```
void *consumer(void *param){
    while (j<=2) {
        sem_wait(&S);

        while (counter == 0)
            ; /* do nothing */
        next_consumed = buffer[out];
        out = (out + 1) % BUFFER_SIZE;
        counter--;
        /* consume the item in next consumed */
        cout<<counter<<" in Consumer"<<endl;
        j++;
        sem_post(&S);
    }
    pthread_exit(NULL);
}

int main(){

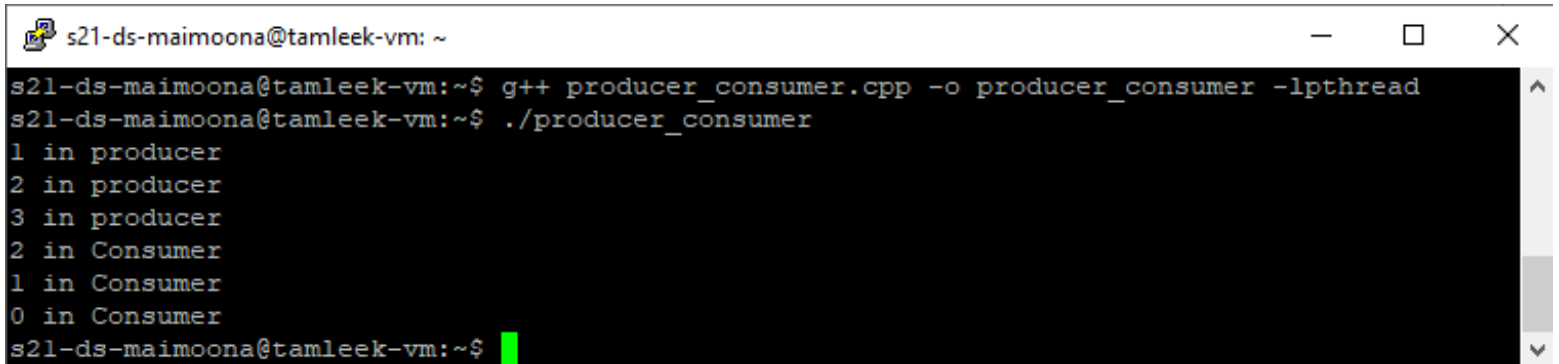
    sem_init(&S,0,1);

    pthread_t tid,tid2;
    pthread_create(&tid,NULL,producer,(void *)NULL);
    pthread_create(&tid2,NULL,consumer,(void *)NULL);
    pthread_join(tid,NULL);
    pthread_exit(NULL);
    return 0;
}
```

Name: Maimoona Khilji

Program: BS-Data Science

Output:



```
s21-ds-maimoona@tamleek-vm: ~  
s21-ds-maimoona@tamleek-vm:~$ g++ producer_consumer.cpp -o producer_consumer -lpthread  
s21-ds-maimoona@tamleek-vm:~$ ./producer_consumer  
1 in producer  
2 in producer  
3 in producer  
2 in Consumer  
1 in Consumer  
0 in Consumer  
s21-ds-maimoona@tamleek-vm:~$
```