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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);
}
```

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

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Output: