**PRODUCER CONSUMER PROBLEM USING SEMAPHORE**

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CSE C

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#include<stdio.h>

#include<semaphore.h>

#include<pthread.h>

#include<unistd.h>

sem\_t mutex, empty,full;

int buffer[5],get=0,item=0,gitem,put=0,pro[20],con[20];

void \*producer(void \*arg)

{

do

{

sem\_wait(&empty);

sem\_wait(&mutex);

buffer[put%5]=item;

item++;

printf("\nproducer %d produces %d item buffered[%d] : %d", (\*(int\*)arg), buffer[put%5],put%5,item);

put++;

sem\_post(&mutex);

sem\_post(&full);

sleep(3);

}while(put<5);

}

void \*consumer(void \*arg)

{

do

{

sem\_wait(&full);

sem\_wait(&mutex);

gitem=buffer[get%5];

printf("\nconsumer %d consumes %d item buffered[%d] : %d",(\*(int \*)arg),gitem,get%5,gitem); get++;

sem\_post(&mutex);

sem\_post(&empty);

sleep(2);

}while(get<5);

}

void main()

{

int p,c,j,k;

pthread\_t a[10],b[10];

sem\_init(&mutex,0,1);

sem\_init(&full,0,0);

sem\_init(&empty,0,5);

printf("Enter number of producers : ");

scanf("%d",&p);

printf("Enter number of consumers : ");

scanf("%d",&c);

for(j=0; j<p; j++)

{

pro[j]=j;

pthread\_create(&a[j],NULL,producer,&pro[j]);

}

for(k=0; k<c; k++)

{

con[k]=k;

pthread\_create(&b[k],NULL,consumer,&con[k]);

}

for(j=0; j<p; j++)

{

pthread\_join(a[j],NULL);

}

for(k=0; k<c; k++)

{

pthread\_join(b[k],NULL);

}

}

**SAMPLE OUTPUT**

Enter number of Producers : 4

Enter number of Consumers:4

producer 3 produces 0 item buffered[0] : 1

consumer 0 consumes 0 item buffered[0] : 0

producer 1 produces 1 item buffered[1] : 2

producer 2 produces 2 item buffered[2] : 3

producer 0 produces 3 item buffered[3] : 4

consumer 1 consumes 1 item buffered[1] : 1

consumer 2 consumes 2 item buffered[2] : 2

consumer 3 consumes 3 item buffered[3] : 3

consumer 0 consumes 0 item buffered[4] : 0

consumer 1 consumes 0 item buffered[0] : 0

consumer 2 consumes 1 item buffered[1] : 1

consumer 3 consumes 2 item buffered[2] : 2