**OPERATING SYSTEM - CS23431**

**EXP 8**

**PRODUCER CONSUMER PROBLEM USING SEMAPHORES**

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**PROGRAM:**

#include <stdio.h>

#include <stdlib.h>

#include <pthread.h>

#include <semaphore.h>

#include <unistd.h>

#define SIZE 10

int buffer[SIZE],count=0;

sem\_t empty, full, mutex;

void\* producer(void\* arg) {

for (int i = 0; i < 10; i++) {

int val;

sem\_getvalue(&empty, &val);

if (val == 0)

printf("Buffer is full. Producer waiting...\n");

sem\_wait(&empty);

sem\_wait(&mutex);

if(count<SIZE)

{

buffer[count++]=i;

printf("Producer produces item: %d\n", i);

}

sem\_post(&mutex);

sem\_post(&full);

sleep(1);

}

return NULL;

}

void\* consumer(void\* arg) {

for (int i = 0; i < 10; i++) {

int val;

sem\_getvalue(&full, &val);

if (val == 0)

printf("Buffer is empty. Consumer waiting...\n");

sem\_wait(&full);

sem\_wait(&mutex);

if(count>0){

printf("Consumer consumes item: %d\n", buffer[--count]);

}

sem\_post(&mutex);

sem\_post(&empty);

sleep(1);

}

return NULL;

}

int main() {

pthread\_t p, c;

int choice;

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

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

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

while(1)

{

printf("1. Producer\n");

printf("2. Consumer\n");

printf("3. Exit\n");

printf("Enter your choice: ");

scanf("%d", &choice);

switch (choice) {

case 1:

pthread\_create(&p, NULL, producer, NULL);

pthread\_join(p, NULL);

break;

case 2:

pthread\_create(&c, NULL, consumer, NULL);

pthread\_join(c, NULL);

break;

case 3:

printf("Exiting...");

exit(0);

default:

printf("Invalid choice!! Please try again.");

break;

}

}

sem\_destroy(&empty);

sem\_destroy(&full);

sem\_destroy(&mutex);

return 0;

}

**OUTPUT:**

