OPERATING SYSTEM - CS23431

EXP 8

PRODUCER CONSUMER PROBLEM USING SEMAPHORES

NAME: ARUL JOTHI P ROLL NO: 230701034

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:

