**ASHNA.V**

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**Ex.No.8:Producer Consumer using Semaphores**

**Aim:**

To write a program to implement solution to producer consumer problem using semaphores.

Code:

#include <stdio.h>

#include <pthread.h>

#include <semaphore.h>

#include <unistd.h>

#define SIZE 5

int buffer[SIZE];

int count = 0;

sem\_t empty, full, mutex;

void\* producer(void\* arg) {

for (int i = 1; i <= 10; i++) {

sem\_wait(&empty);

sem\_wait(&mutex);

buffer[count] = i;

printf("Produced: %d\n", i);

count++;

sem\_post(&mutex);

sem\_post(&full);

sleep(1); // small delay

}

return NULL;

}

void\* consumer(void\* arg) {

for (int i = 1; i <= 10; i++) {

sem\_wait(&full);

sem\_wait(&mutex);

int item = buffer[count - 1];

printf("Consumed: %d\n", item);

count--;

sem\_post(&mutex);

sem\_post(&empty);

sleep(1); // small delay

}

return NULL;

}

int main() {

pthread\_t p, c;

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

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

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

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

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

pthread\_join(p, NULL);

pthread\_join(c, NULL);

sem\_destroy(&empty);

sem\_destroy(&full);

sem\_destroy(&mutex);

return 0;

}

Output:

Produced: 1

Consumed: 1

Produced: 2

Consumed: 2

Produced: 3

Consumed: 3

Produced: 4

Consumed: 4

Produced: 5

Consumed: 5

Produced: 6

Consumed: 6

Produced: 7

Consumed: 7

Produced: 8

Consumed: 8

Produced: 9

Consumed: 9

Produced: 10

Consumed: 10