

OS LAB MANUAL (CS23431)

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EX.NO:8

PRODUCER CONSUMER USING SEMAPHORES

Aim: To write a C program to do Inter Process Communication (IPC) using shared memory between sender process and receiver process

Program:

```
#include<stdio.h>

#include<stdlib.h>

int mutex = 1, full = 0, empty = 3, x = 0;

int wait(int s) {
    return (--s);
}

int signal(int s) {
    return (++s);
}

void producer() {
    mutex = wait(mutex);

    full = signal(full);

    empty = wait(empty);

    x++;

    printf("\nProducer produces item %d", x);

    mutex = signal(mutex);
}

void consumer() {
    mutex = wait(mutex);

    full = wait(full);

    empty = signal(empty);

    printf("\nConsumer consumes item %d", x);

    x--;
```

```
    mutex = signal(mutex);
}

int main() {
    int n;

    printf("\n1.Producer\n2.Consumer\n3.Exit");
    while(1) {
        printf("\nEnter your choice: ");
        scanf("%d", &n);
        switch(n) {
            case 1:
                if ((mutex == 1) && (empty != 0))
                    producer();
                else
                    printf("Buffer is full!!");
                break;
            case 2:
                if ((mutex == 1) && (full != 0))
                    consumer();
                else
                    printf("Buffer is empty!!");
                break;
            case 3:
                exit(0);
            default:
                printf("Invalid choice!");
        }
    }
    return 0;
}
```

Input:

1. Producer
2. Consumer
3. Exit

Output:

```
Enter your choice: 1

Producer produces item 1
Enter your choice: 2

Consumer consumes item 1
Enter your choice: 2

Buffer is empty!!
Enter your choice: 2

Buffer is empty!!
Enter your choice: 1

Producer produces item 1
Enter your choice: 1

Producer produces item 2
Enter your choice: 2

Consumer consumes item 2
Enter your choice: 2

Consumer consumes item 1
Enter your choice: 2

Buffer is empty!!
```