CS331

S5 SEMESTER

# System Software Lab

**Github :** [ceccs18c59/cs331: System Software Lab (github.com)]

## Experiment No 7

Write a C program to implement the producer-consumer problem using semaphores.

### Program

```
#include <stdio.h>
#include <stdlib.h>

int mutex = 1, full = 0, empty = 2, x = 0;

int main()
{
    int n;
    void producer();
    void consumer();
    int wait(int);
    int signal(int);
    printf("1.Producer\n2.Consumer\n3.Exit");
    while (1)
    {
        printf("\n\nEnter your choice:");
        scanf("%d", &n);
        switch (n)
        {
        case 1:
            if ((mutex == 1) && (empty != 0))
                producer();
            else
                printf("\nBuffer is full!!");
            break;
        case 2:
            if ((mutex == 1) && (full != 0))
                consumer();
            else
                printf("\nBuffer is empty!!");
            break;
        case 3:
            exit(0);
            break;
        }
    }

    return 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 the 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);
}
```

## Output