**Ex. No.:** 8
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## PRODUCER CONSUMER USING SEMAPHORES

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

**Algorithm:**

1. Initialize semaphore empty, full and mutex.
2. Create two threads- producer thread and consumer thread.
3. Wait for target thread termination.
4. Call sem_wait on empty semaphore followed by mutex semaphore before entry into critical section.
5. Produce/Consume the item in critical section.
6. Call sem_post on mutex semaphore followed by full semaphore
7. before exiting critical section.
8. Allow the other thread to enter its critical section.
9. Terminate after looping ten times in producer and consumer Threads each.

**Program Code:**

```
#include< stdio.h>
#define BUFF 5
int queue [5], n=0;
void produce() {
    if(n==BUFF)
        printf("Buffer is full \n");
    else{
        queue [n]= 1;
        n++;
        printf("Element is added\n");
    }
}
void consume(){
    if(n==0)
    {   printf("Buffer is empty\n");
    }
```

```
        else {
            n--;
            queue[n]=0;
            printf("Element removed \n");

        }
    }
    void view(){
        for(int i=0; i<5; i++)
            printf("%d ", queue[i]);

        printf("\n");

    }
    int main()
    {
        printf("1. Produce\n2. Consume\n 3. View the
            queue\n 4. Exit\n");
        int flag=1, choice;
        while (flag)
        {
            scanf("%d", &choice);
            switch(choice){
                case 1:
                    produce();
                    break;
                case 2:
                    consume();
                    break;
            case 3:
                 view();
                  break;
            case 4:
                 flag=0;
                  break();
        }
    }
    return 0;
}
```

OUTPUT:

```
  1. Produce
  2. Consume
  3. View the queue
  4. Exit
   1
  Element is added
   1
  Element is added
  1
  Element is added
  1
  Element is added
  1
  Element is added
  1
  Buffer is full
  2
  Element is removed
  2
  Element is removed
  3
  1 1 1  0 0
  4
```

**Sample Output:**

```
1. Producer
2.Consumer
3.Exit
Enter your choice:1
Producer produces the item 1
Enter your choice:2
Consumer consumes item
1 Enter your choice:2
Buffer is empty!!
Enter your choice:1
Producer produces the item 1
Enter your choice:1
Producer produces the item 2
Enter your choice:1
Producer produces the item 3
Enter your choice:1
Buffer is full!!
Enter your choice:3
```

**Result:** A C program is implemented for producer-consumer using semaphore.