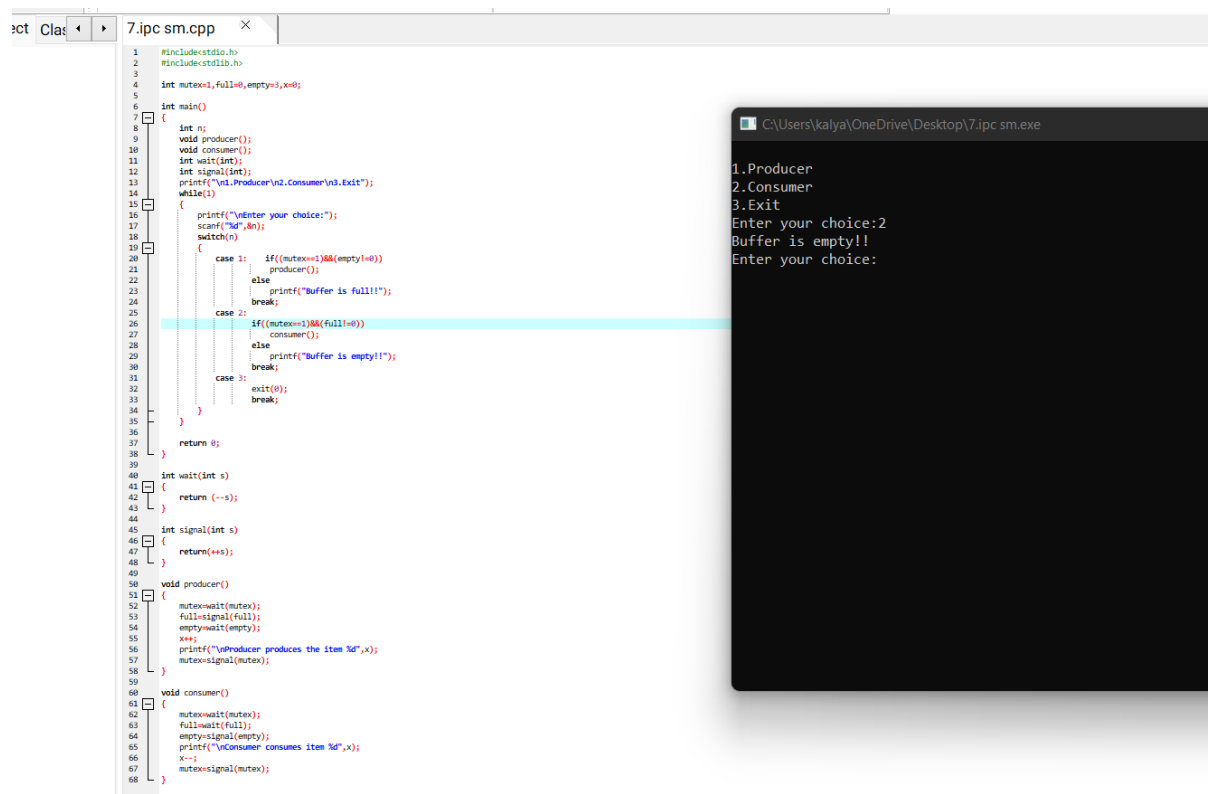


15 Construct a C program to simulate producer-consumer problem using semaphores.



The image shows a C program for the producer-consumer problem using semaphores. The code is written in a text editor and is being executed in a terminal window.

Source Code (7.ipc sm.cpp):

```
1 #include<stdio.h>
2 #include<stdlib.h>
3
4 int mutex=1,full=0,empty=3,x=0;
5
6 int main()
7 {
8     int n;
9     void producer();
10    void consumer();
11    int wait(int);
12    int signal(int);
13    printf("\n1.Producer\n2.Consumer\n3.Exit");
14    while(1)
15    {
16        printf("\nEnter your choice:");
17        scanf("%d",&n);
18        switch(n)
19        {
20            case 1: if((mutex==1)&&(empty!=0))
21                    producer();
22                    else
23                        printf("\nBuffer is full!!");
24                    break;
25            case 2: if((mutex==1)&&(full!=0))
26                    consumer();
27                    else
28                        printf("\nBuffer is empty!!");
29                    break;
30            case 3: exit(0);
31                    break;
32        }
33    }
34    return 0;
35 }
36
37 int wait(int s)
38 {
39     return (--s);
40 }
41
42 int signal(int s)
43 {
44     return(++s);
45 }
46
47 void producer()
48 {
49     mutex=wait(mutex);
50     full=signal(full);
51     empty=wait(empty);
52     x++;
53     printf("\nProducer produces the item %d",x);
54     mutex=signal(mutex);
55 }
56
57 void consumer()
58 {
59     mutex=wait(mutex);
60     full=wait(full);
61     empty=signal(empty);
62     printf("\nConsumer consumes item %d",x);
63     x--;
64     mutex=signal(mutex);
65 }
```

Terminal Output (C:\Users\kalya\OneDrive\Desktop\7.ipc sm.exe):

```
1.Producer
2.Consumer
3.Exit
Enter your choice:2
Buffer is empty!!
Enter your choice:
```