Write a C program to simulate producer-consumer problem using semaphores

```
#include<stdio.h>
#include<stdlib.h>
int mutex = 1, full = 0, empty = 5, x = 0;

int main()
{
int n;
void producer();
void consumer();
int wait(int);
int signal(int);

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);
            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:

```
1.Producer
2.Consumer
3.Exit
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

Producer produces the item 4
Enter your choice:2

Consumer consumes item 4
Enter your choice:2

Consumer consumes item 3
Enter your choice:2

Consumer consumes item 2
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:3

Process returned 0 (0x0)   execution time : 291.395 s
Press any key to continue.
```