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

1.1.1 Code:

```
#include<stdio.h>
#include<stdlib.h>
int mutex=1,full=0,empty=3,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);
}
```

```
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
```

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 in n;
 world product ();
 good consumer ();
  uit wait (int );
 ent signal (ant);
 prints (" n 1. produce n 2. consumes \ n 3. Frit")
 phile (1)
  hounty [" (n Enler Charce:");
  Sound ("% d", 5, 1);
   Broitch (n)
   2 case 1: 13 (courters = = 1) 88 (empty !=0))
    feoduce (?)
    print ( Butter is full !!");
     break;
  Case 2:
     Ch (Courles, ==1) & & (full! =0))
     donsames ();
      period ("Buffer is emply !1");
```

```
exit Lo);
   mean;
 Releven 0;
 ent wait Cents )
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 ful = Fignal (fall);
emply = would (emply);
 X++;
 Mains (" in Produces Moduces the clem % d", x)
 Mules = segnal (mules);
 3 void Consumer ()
 mules = coast (daules);
fule Front (full );
 copy = Signal (empty)
Arint (" \n bonsumes lons craves clein tod" N)
 x--;
```