

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

Producer Consumer

```
?  
#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 i);  
    int signal (int);  
    printf ("\\n 1. Producer \\n 2. Consumer \\n 3. Exit")  
    while (1)  
    {  
        printf ("\\n Enter 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(Cont)
{
    return (--s);
}

int Signal(wrs)
{
    return(++s);
}

void produces()
{
    mutex = wait(mutex);
    full = signal(full);
    empty = wait(empty);
    x++;
    printf("\n Producer produces the elem %d", x);
    mutex = signal(mutex);
}

void consumes()
{
    mutex = wait(mutex);
    full = wait(full);
    empty = signal(empty);
    printf("\n consumer consumes elem %d", x);
    x--;
}

```

