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

```
#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("\n Enter 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("\n Producer produces the item %d", x);
mutex = signal(mutex);
}
void consumer()
{
mutex = wait(mutex);
full = wait(full);
empty = signal(empty);
Printf("\n consumer consumes item %d", x);
x--;
mutex = signal(mutex);
}
```

Output

1. Producer
2. consumer
3. Exit

Enter your choice : 2
Buffer is empty !!
Enter your choice : 1

Producer produces item 1.
Enter your choice: 1.
Producer produces item 2
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.

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C:\Users\STUDENT Desktop pc.exe

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