

```

#include <stdio.h>
#include <stdlib.h>
int mutex = 1;
int full = 0;
int empty = 3;
int x = 0;
void wait() {
    --mutex;
}
void signal() {
    ++mutex;
}
void producer() {
    wait();
    ++full;
    --empty;
    x++;
    printf("Producer has produced: Item %d\n", x);
    signal();
}
void consumer() {
    wait();
    --full;
    ++empty;
    printf("Consumer has consumed: Item %d\n", x);
    x--;
    signal();
}
int main() {
    int choice;
    while (1) {
        printf("\n1.Producer 2.Consumer 3.Exit\n");
        printf("Enter your choice: ");
        scanf("%d", &choice);
        switch (choice) {
            case 1:
                if ((mutex == 1) && (empty != 0)) {
                    producer();
                } else {
                    printf("Buffer is full!\n");
                }
                break;
            case 2:
                if ((mutex == 1) && (full != 0)) {
                    consumer();
                } else {
                    printf("Buffer is empty!\n");
                }
                break;
            case 3:
                exit(0);
            default:
                printf("Invalid choice!\n");
        }
    }

    return 0;
}

```

```
PS C:\Users\STUDENT\Desktop\Archita OS lab> cd "c:\Users\STUDENT\Desktop\Archita OS lab\" ; if ($?) { gcc sema.c -o sema } ; if ($?) { .\sema }
```

```
1.Producer 2.Consumer 3.Exit  
Enter your choice: 1  
Producer has produced: Item 1
```

```
1.Producer 2.Consumer 3.Exit  
Enter your choice: 1  
Producer has produced: Item 2
```

```
1.Producer 2.Consumer 3.Exit  
Enter your choice: 2  
Consumer has consumed: Item 2
```

```
1.Producer 2.Consumer 3.Exit  
Enter your choice: 2  
Consumer has consumed: Item 1
```

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

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

```
1.Producer 2.Consumer 3.Exit  
Enter your choice: 3
```

```
PS C:\Users\STUDENT\Desktop\Archita OS lab> cd "c:\Users\STUDENT\Desktop\Archita OS lab\" ; if ($?) { gcc multi1.c -o multi1 } ; if ($?) { .\multi1 }
```