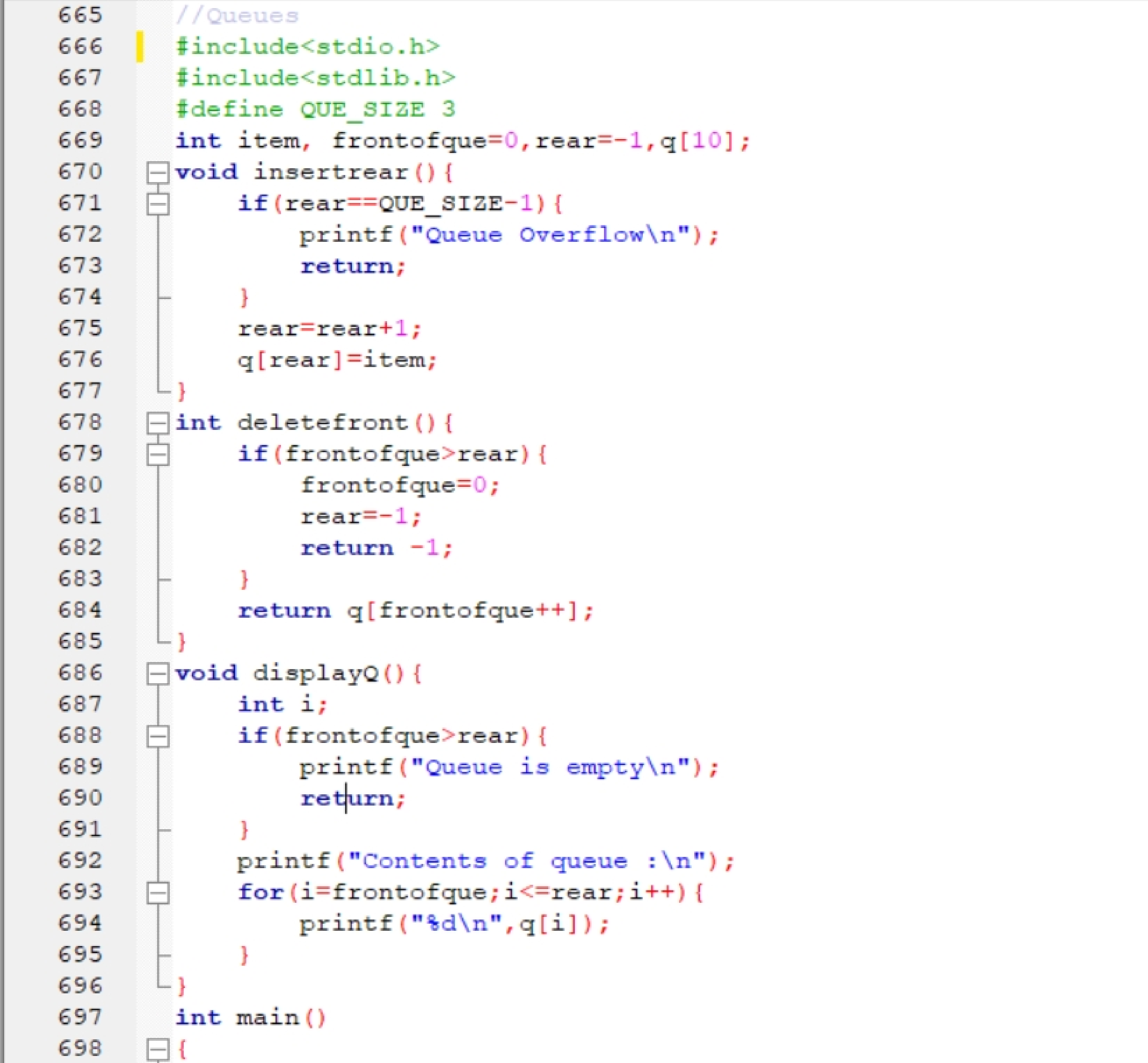
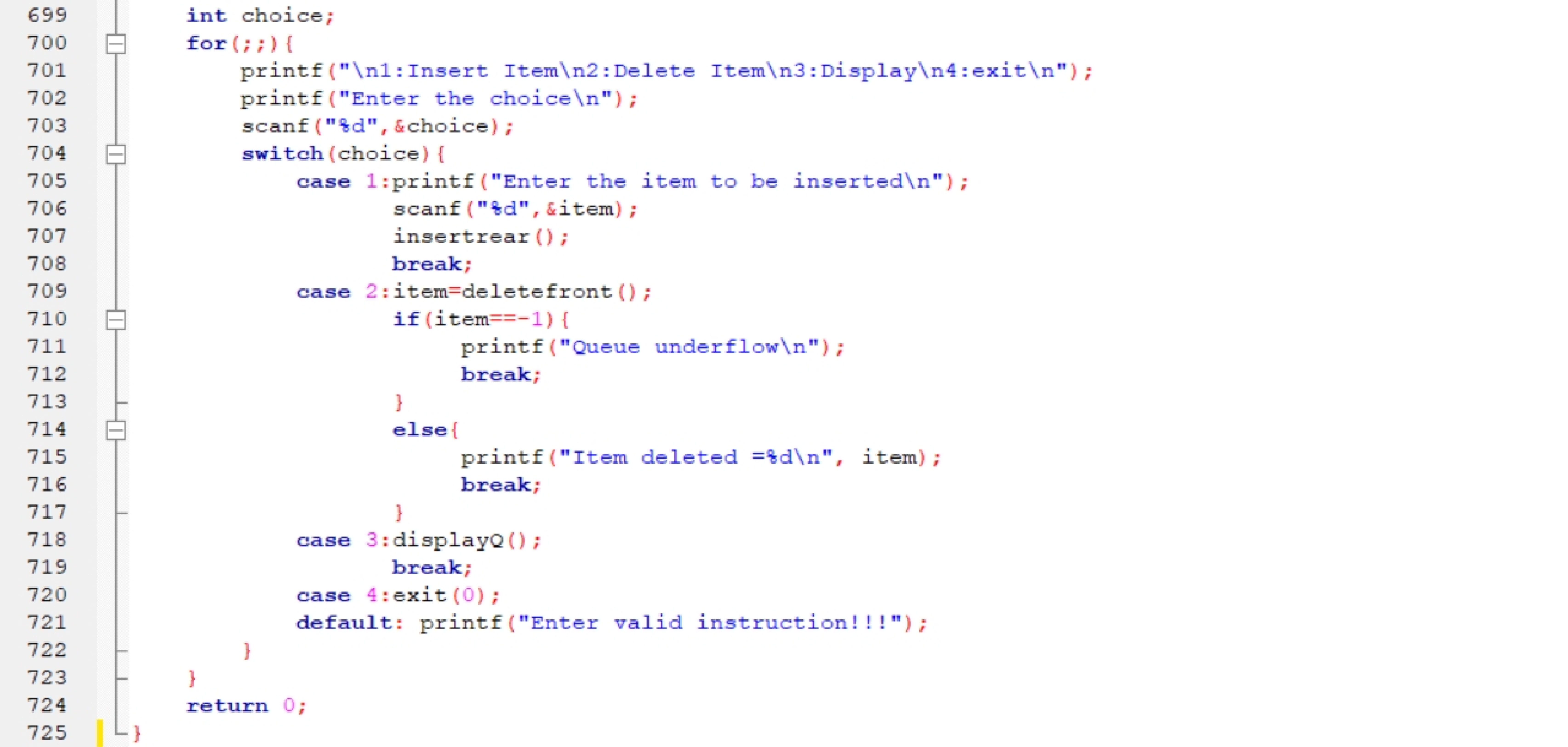
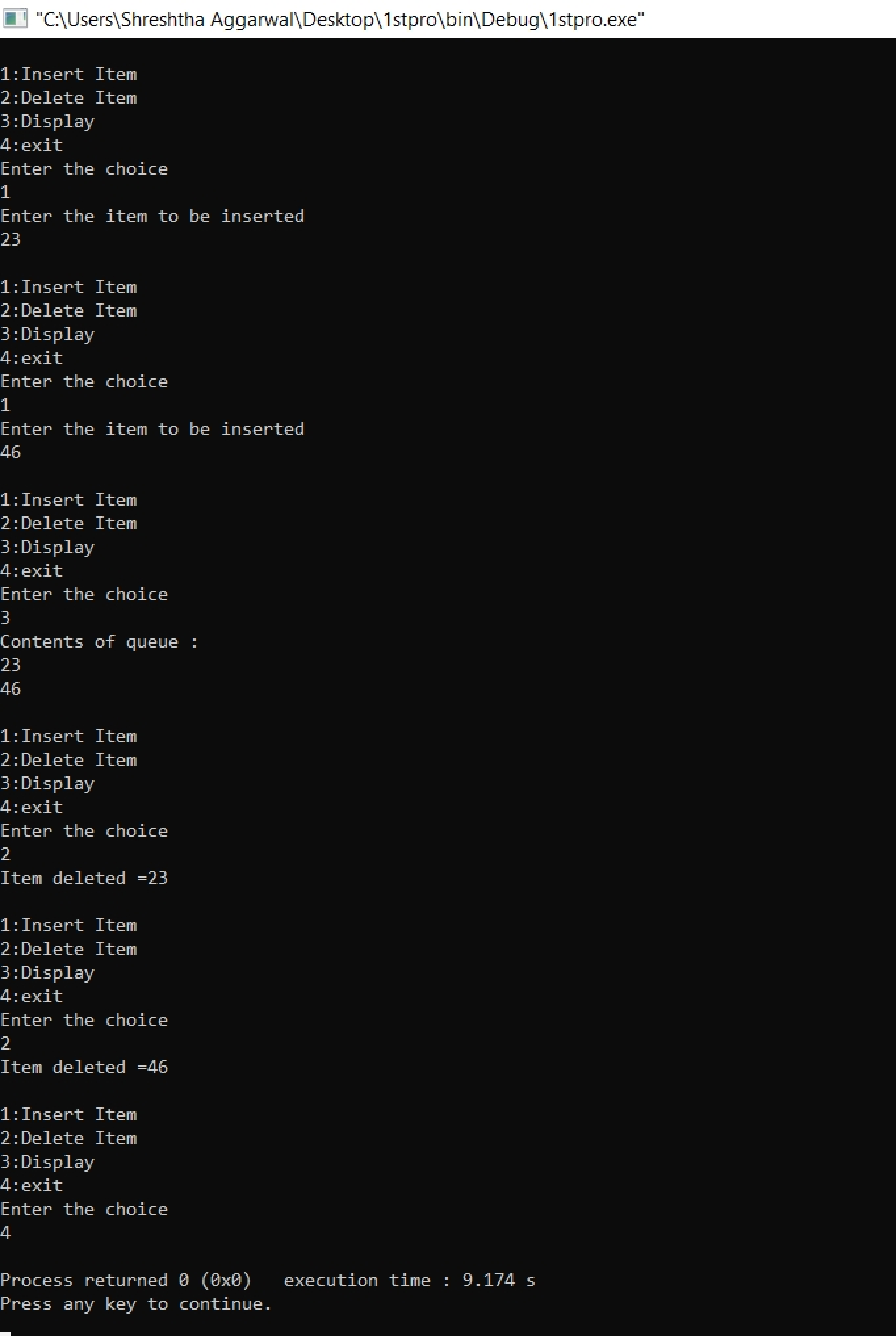


```c
//Queues
#include<stdio.h>
#include<stdlib.h>
#define QUE_SIZE 3
int item, frontofque=0,rear=-1,q[10];
void insertrear(){
    if(rear==QUE_SIZE-1){
        printf("Queue Overflow\n");
        return;
    }
    rear=rear+1;
    q[rear]=item;
}
int deletefront(){
    if(frontofque>rear){
        frontofque=0;
        rear=-1;
        return -1;
    }
    return q[frontofque++];
}
void displayQ(){
    int i;
    if(frontofque>rear){
        printf("Queue is empty\n");
        return;
    }
    printf("Contents of queue :\n");
    for(i=frontofque;i<=rear;i++){
        printf("%d\n",q[i]);
    }
}
int main()
{
```

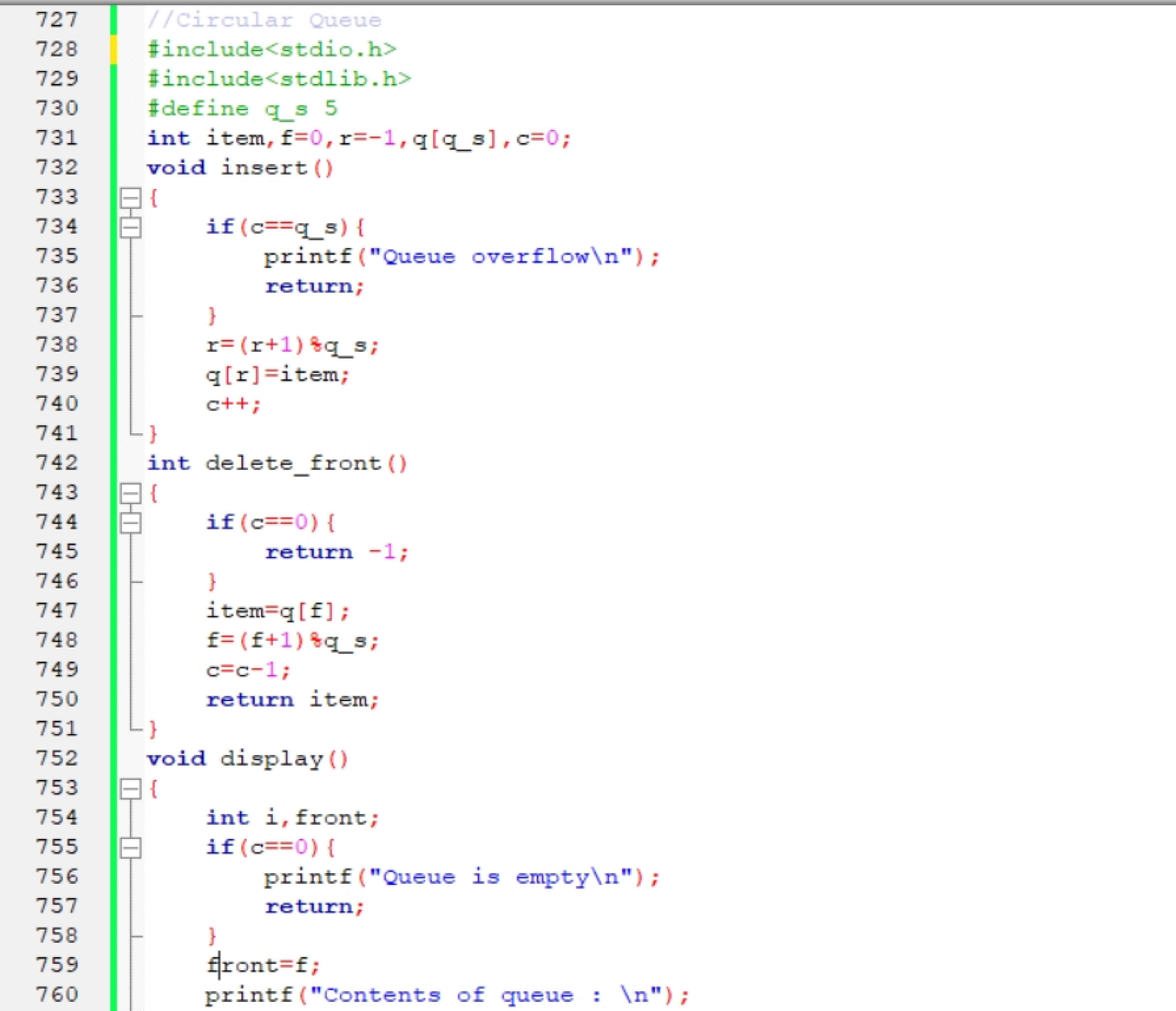


```
    int choice;
    for(;;){
        printf("\n1:Insert Item\n2:Delete Item\n3:Display\n4:exit\n");
        printf("Enter the choice\n");
        scanf("%d",&choice);
        switch(choice){
            case 1:printf("Enter the item to be inserted\n");
                   scanf("%d",&item);
                   insertrear();
                   break;
            case 2:item=deletefront();
                   if(item==-1){
                        printf("Queue underflow\n");
                        break;
                   }
                   else{
                        printf("Item deleted =%d\n", item);
                        break;
                   }
            case 3:displayQ();
                   break;
            case 4:exit(0);
            default: printf("Enter valid instruction!!!");
        }
    }
    return 0;
}
```

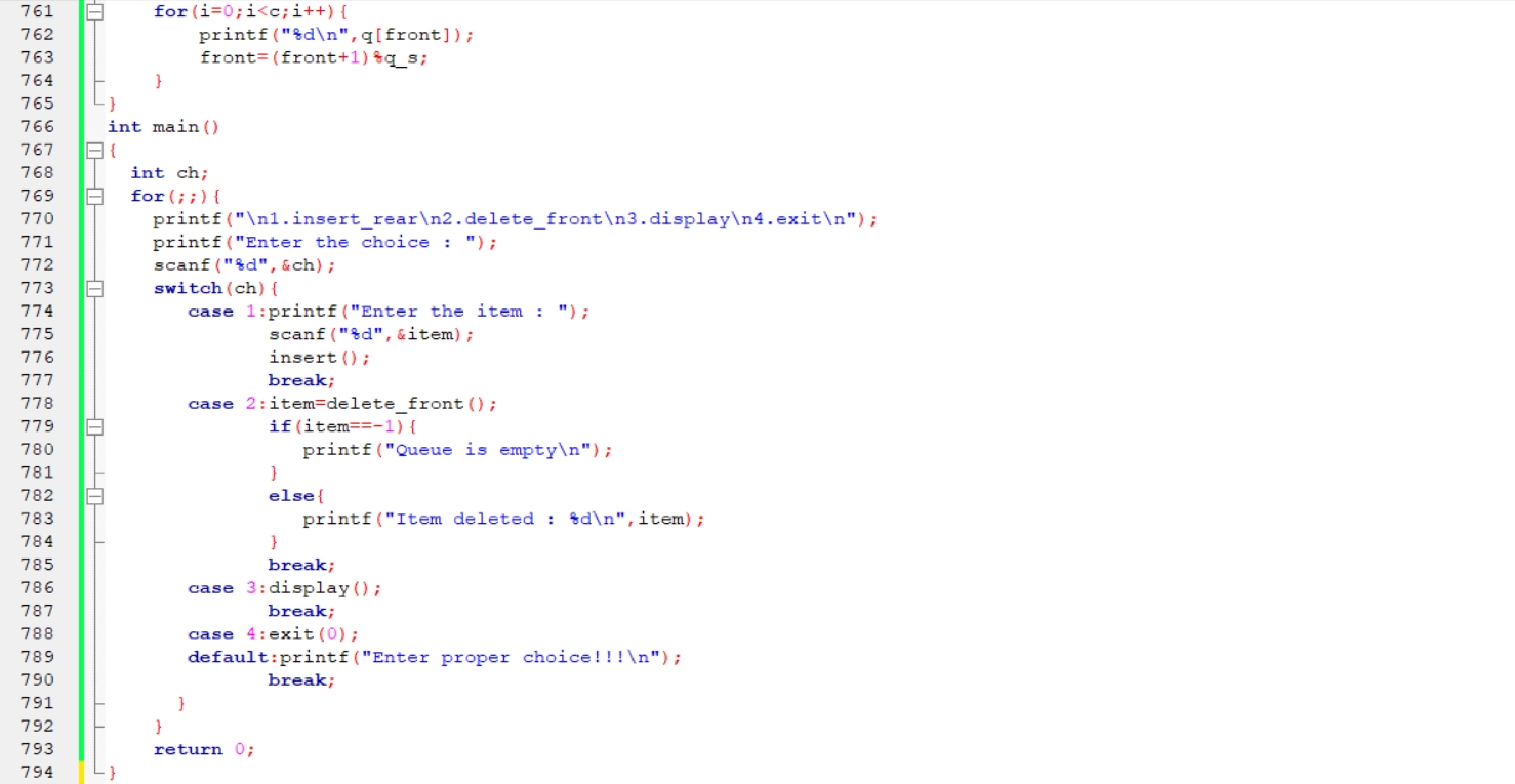


"C:\Users\Shreshtha Aggarwal\Desktop\1stpro\bin\Debug\1stpro.exe"

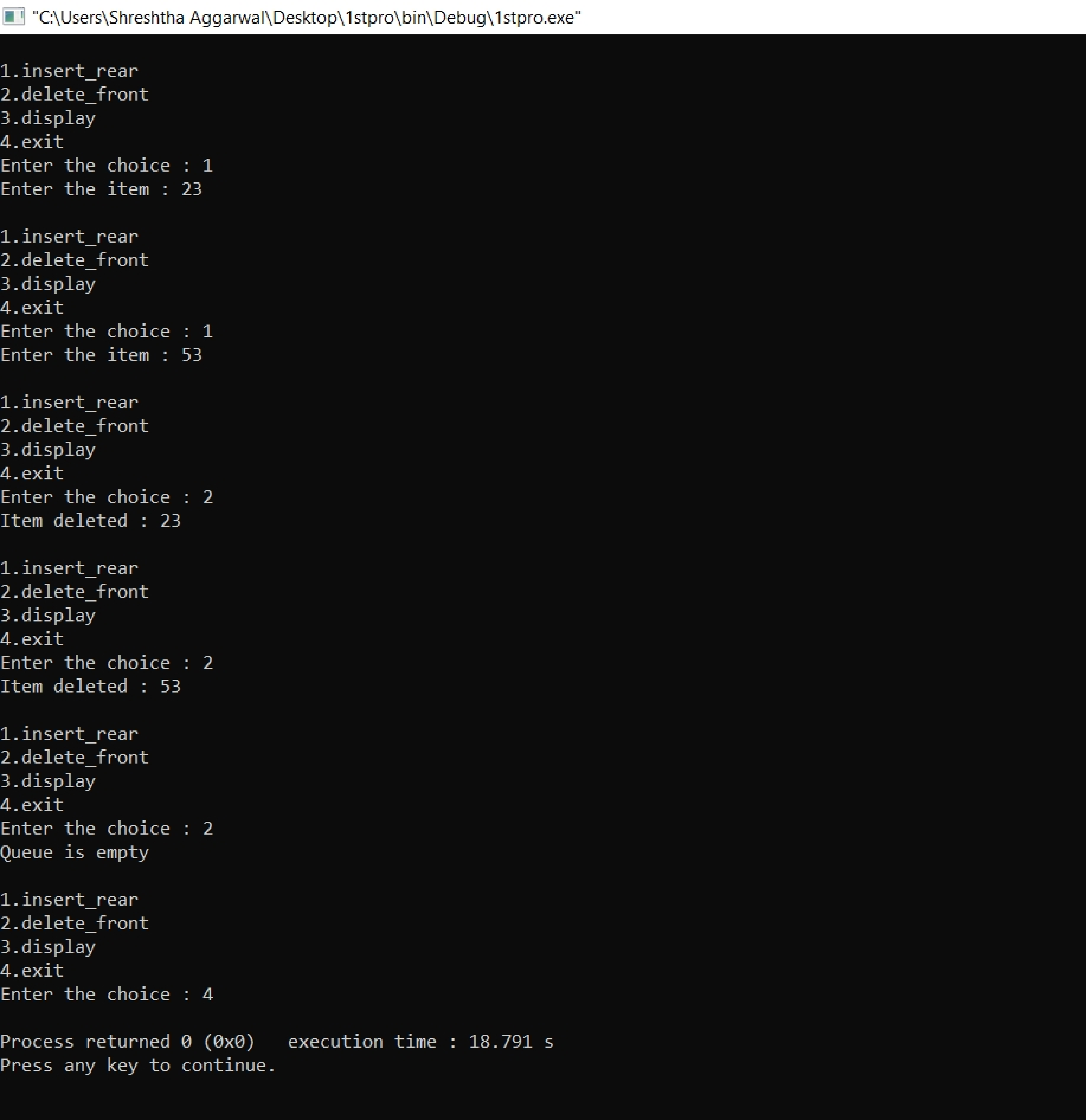
```

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
1
Enter the item to be inserted
23

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
1
Enter the item to be inserted
46

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
3
Contents of queue :
23
46

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
2
Item deleted =23

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
2
Item deleted =46

1:Insert Item
2:Delete Item
3:Display
4:exit
Enter the choice
4

Process returned 0 (0x0)   execution time : 9.174 s
Press any key to continue.
```



```c
//Circular Queue
#include<stdio.h>
#include<stdlib.h>
#define q_s 5
int item,f=0,r=-1,q[q_s],c=0;
void insert()
{
    if(c==q_s){
        printf("Queue overflow\n");
        return;
    }
    r=(r+1)%q_s;
    q[r]=item;
    c++;
}
int delete_front()
{
    if(c==0){
        return -1;
    }
    item=q[f];
    f=(f+1)%q_s;
    c=c-1;
    return item;
}
void display()
{
    int i,front;
    if(c==0){
        printf("Queue is empty\n");
        return;
    }
    front=f;
    printf("Contents of queue : \n");
```

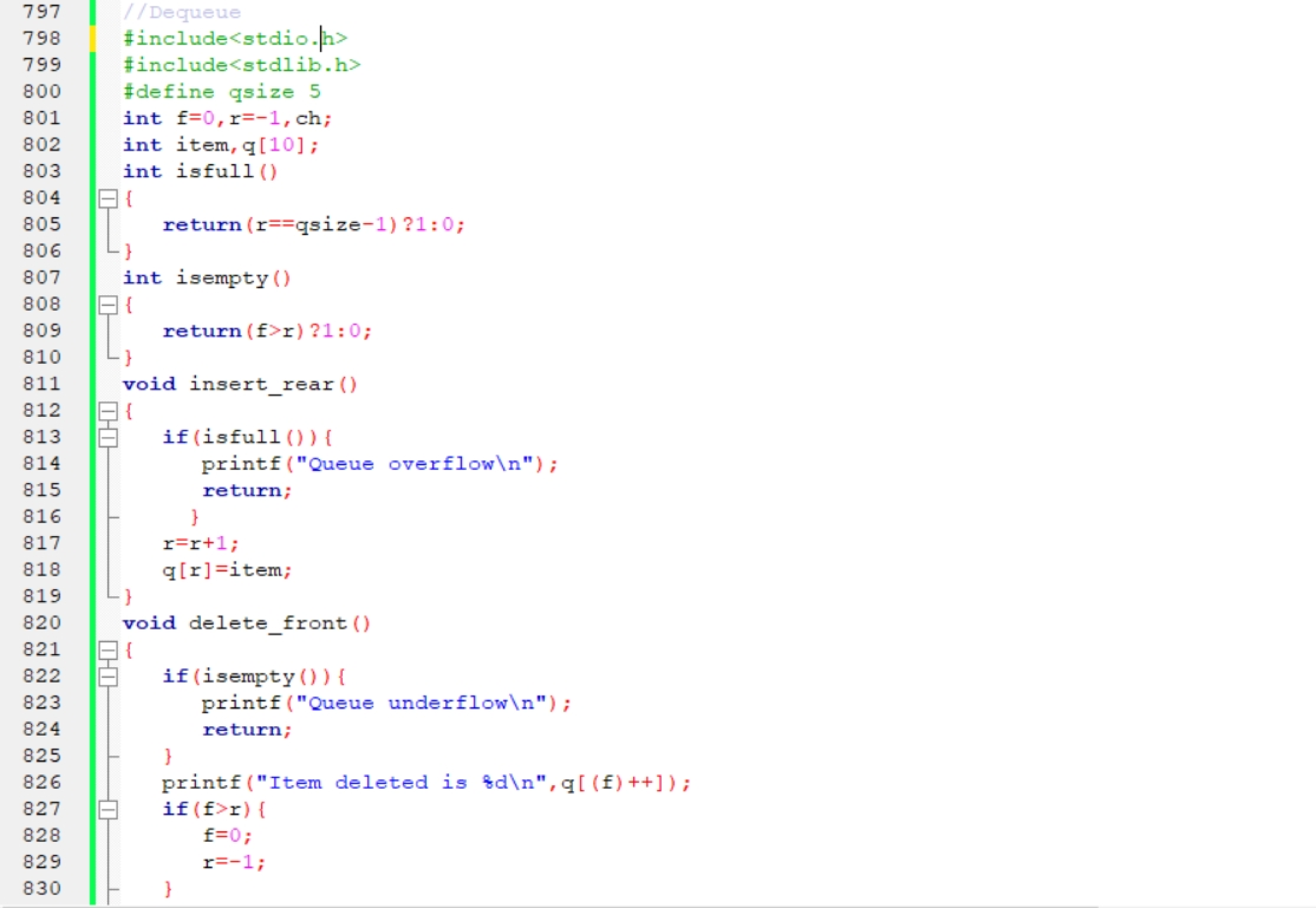


```
    for(i=0;i<c;i++){
        printf("%d\n",q[front]);
        front=(front+1)%q_s;
    }
}
int main()
{
  int ch;
  for(;;){
    printf("\n1.insert_rear\n2.delete_front\n3.display\n4.exit\n");
    printf("Enter the choice : ");
    scanf("%d",&ch);
    switch(ch){
       case 1:printf("Enter the item : ");
              scanf("%d",&item);
              insert();
              break;
       case 2:item=delete_front();
              if(item==-1){
                 printf("Queue is empty\n");
              }
              else{
                 printf("Item deleted : %d\n",item);
              }
              break;
       case 3:display();
              break;
       case 4:exit(0);
       default:printf("Enter proper choice!!!\n");
              break;
      }
    }
    return 0;
}
```

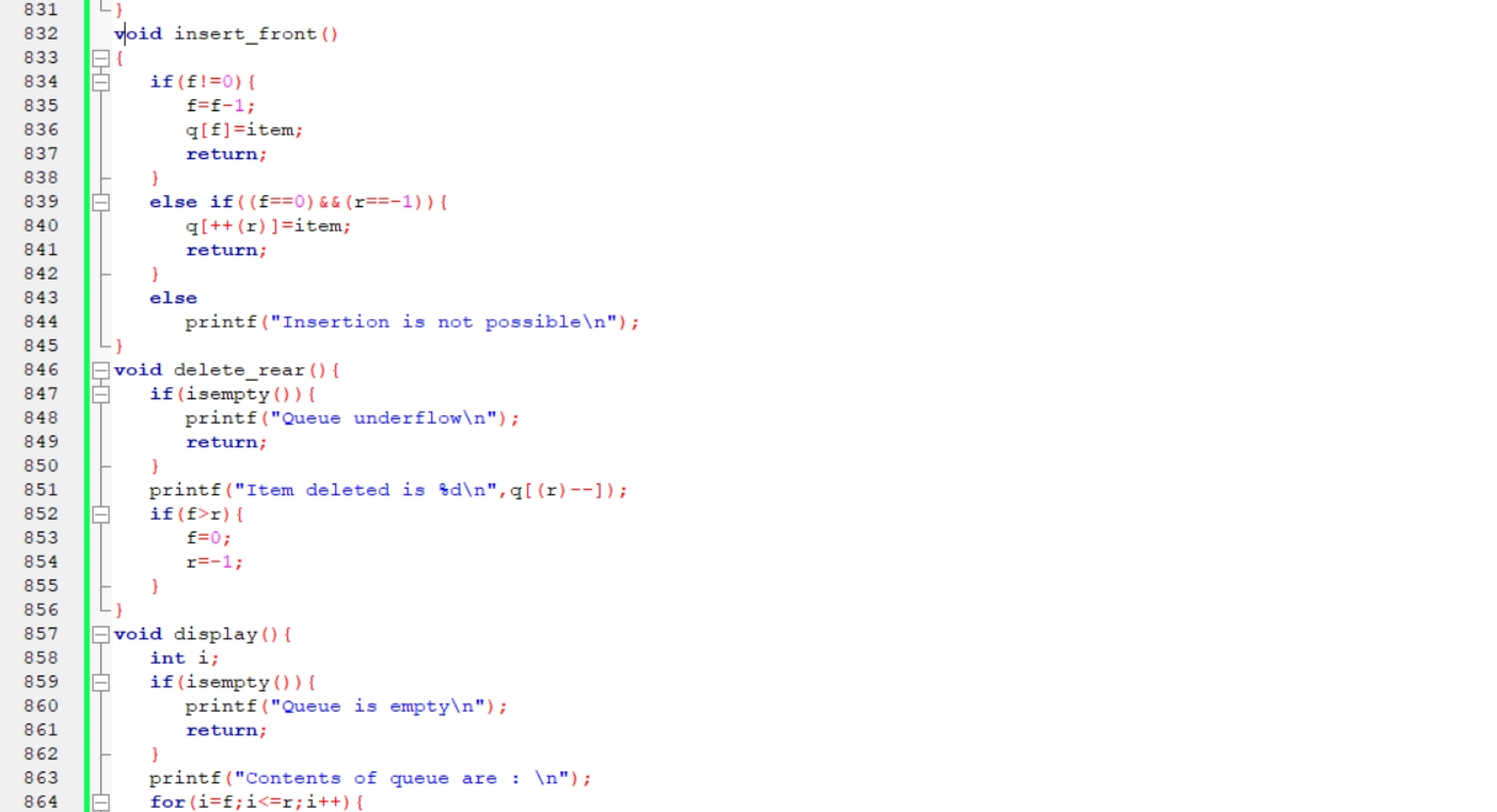


"C:\Users\Shreshtha Aggarwal\Desktop\1stpro\bin\Debug\1stpro.exe"

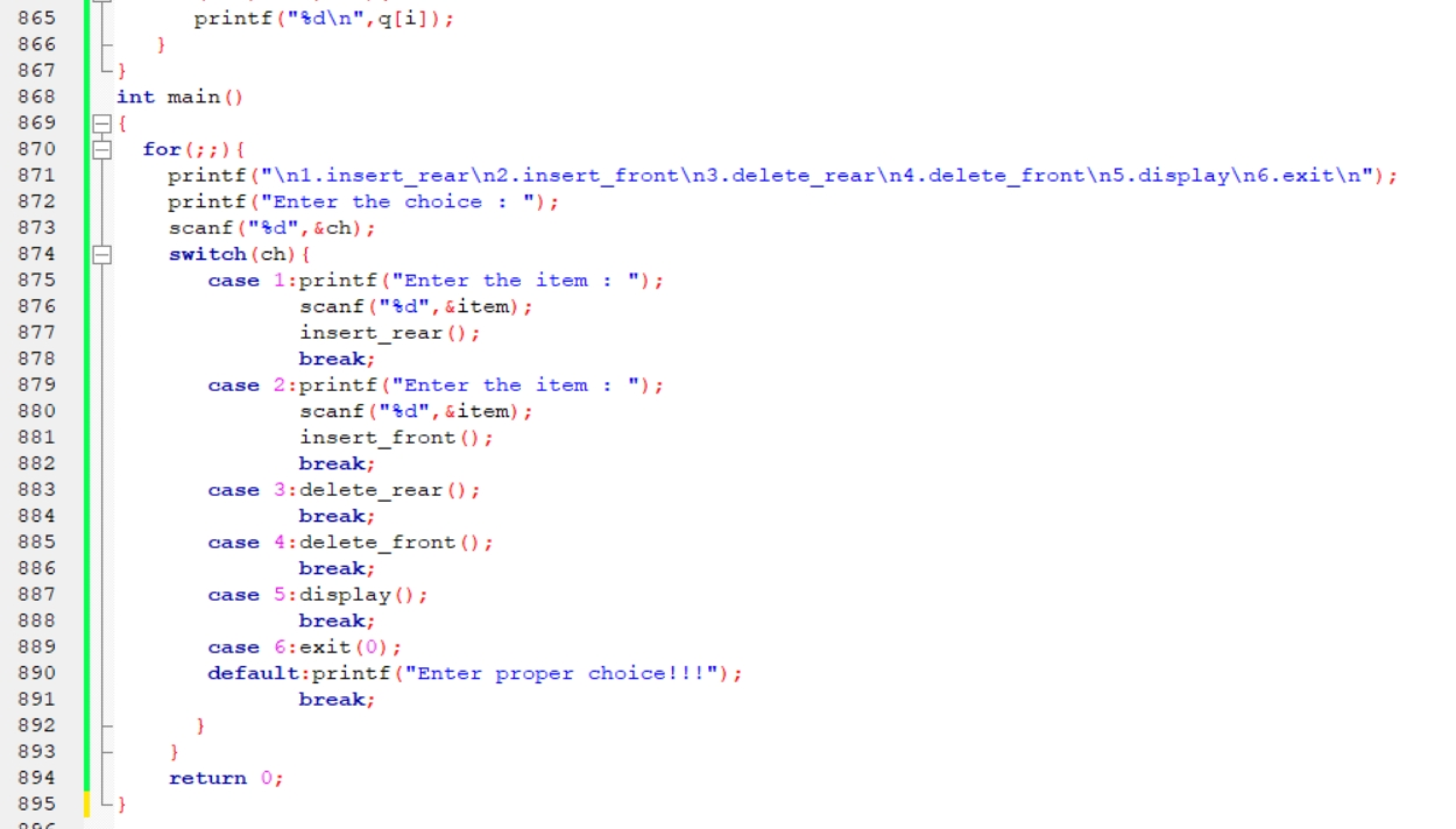
```

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 1
Enter the item : 23

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 1
Enter the item : 53

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 2
Item deleted : 23

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 2
Item deleted : 53

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 2
Queue is empty

1.insert_rear
2.delete_front
3.display
4.exit
Enter the choice : 4

Process returned 0 (0x0)   execution time : 18.791 s
Press any key to continue.
```



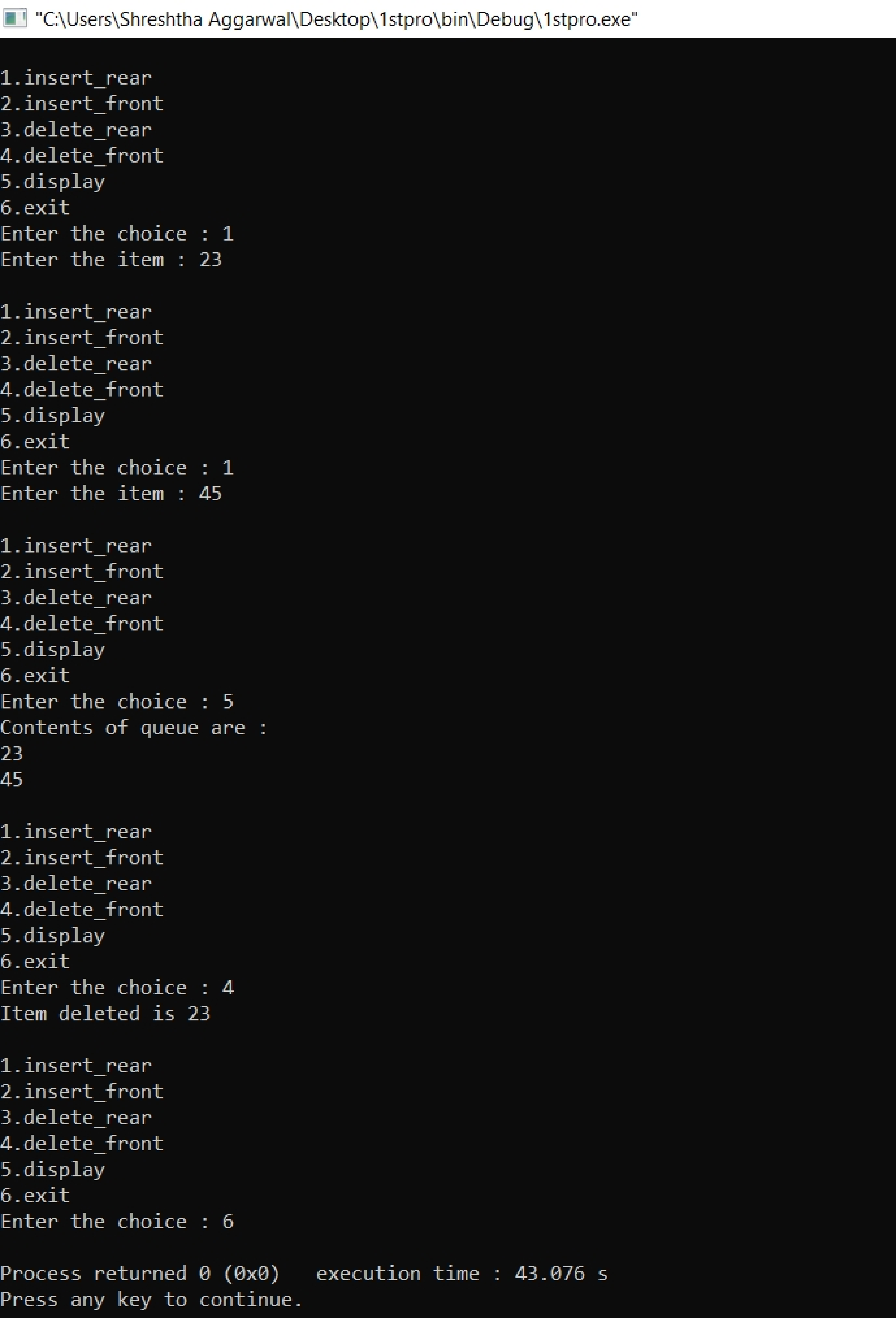
```c
//Dequeue
#include<stdio.h>
#include<stdlib.h>
#define qsize 5
int f=0,r=-1,ch;
int item,q[10];
int isfull()
{
   return(r==qsize-1)?1:0;
}
int isempty()
{
   return(f>r)?1:0;
}
void insert_rear()
{
   if(isfull()){
      printf("Queue overflow\n");
      return;
     }
   r=r+1;
   q[r]=item;
}
void delete_front()
{
   if(isempty()){
      printf("Queue underflow\n");
      return;
   }
   printf("Item deleted is %d\n",q[(f)++]);
   if(f>r){
      f=0;
      r=-1;
   }
```



```c
}
void insert_front()
{
    if(f!=0){
        f=f-1;
        q[f]=item;
        return;
    }
    else if((f==0)&&(r==-1)){
        q[++(r)]=item;
        return;
    }
    else
        printf("Insertion is not possible\n");
}
void delete_rear(){
    if(isempty()){
        printf("Queue underflow\n");
        return;
    }
    printf("Item deleted is %d\n",q[(r)--]);
    if(f>r){
        f=0;
        r=-1;
    }
}
void display(){
    int i;
    if(isempty()){
        printf("Queue is empty\n");
        return;
    }
    printf("Contents of queue are : \n");
    for(i=f;i<=r;i++){
```



```
      printf("%d\n",q[i]);
   }
}
int main()
{
  for(;;){
    printf("\n1.insert_rear\n2.insert_front\n3.delete_rear\n4.delete_front\n5.display\n6.exit\n");
    printf("Enter the choice : ");
    scanf("%d",&ch);
    switch(ch){
       case 1:printf("Enter the item : ");
              scanf("%d",&item);
              insert_rear();
              break;
       case 2:printf("Enter the item : ");
              scanf("%d",&item);
              insert_front();
              break;
       case 3:delete_rear();
              break;
       case 4:delete_front();
              break;
       case 5:display();
              break;
       case 6:exit(0);
       default:printf("Enter proper choice!!!");
              break;
      }
    }
    return 0;
}
```



"C:\Users\Shreshtha Aggarwal\Desktop\1stpro\bin\Debug\1stpro.exe"

```

1.insert_rear
2.insert_front
3.delete_rear
4.delete_front
5.display
6.exit
Enter the choice : 1
Enter the item : 23

1.insert_rear
2.insert_front
3.delete_rear
4.delete_front
5.display
6.exit
Enter the choice : 1
Enter the item : 45

1.insert_rear
2.insert_front
3.delete_rear
4.delete_front
5.display
6.exit
Enter the choice : 5
Contents of queue are :
23
45

1.insert_rear
2.insert_front
3.delete_rear
4.delete_front
5.display
6.exit
Enter the choice : 4
Item deleted is 23

1.insert_rear
2.insert_front
3.delete_rear
4.delete_front
5.display
6.exit
Enter the choice : 6

Process returned 0 (0x0)   execution time : 43.076 s
Press any key to continue.
```