

Introduction

Queue is a linear Data Structure in which the operations are performed based on FIFO (First In First Out) principle.

In a Queue always the Insertion operation is done at “rear” and Deletion operation is done at “front”.

In a Queue sequence of elements entered into the queue is same as the sequence of elements leave the queue.

Queue

Queue is full
Queue is empty

Implementation

```
#define size 10
void main()
{
    int Q[size], front = -1, rear = -1, op, element;
    void enqueue(int);
    void dequeue();
    void display();
    printf("Select your option: ");
    printf("1: Insert\n2: Delete\n3: Display\n");
    scanf("%d", &op);
    switch(op)
    {
        case 1: printf("Enter element to be insert: ");
                scanf("%d", &element);
                enqueue(element);
                break;
        case 2: dequeue();
                break;
        case 3: display();
                break;
    }
}
```

When the compiler executes above code it allocates memory as follows....



$f = r = -1$

f = front
r = rear

Queue is
EMPTY

Insertion

```
enqueue( int element )
```

```
{
```

```
    if( rear != size-1)
```

```
    {
```

```
        rear ++;
```

```
        Q[rear] = element;
```

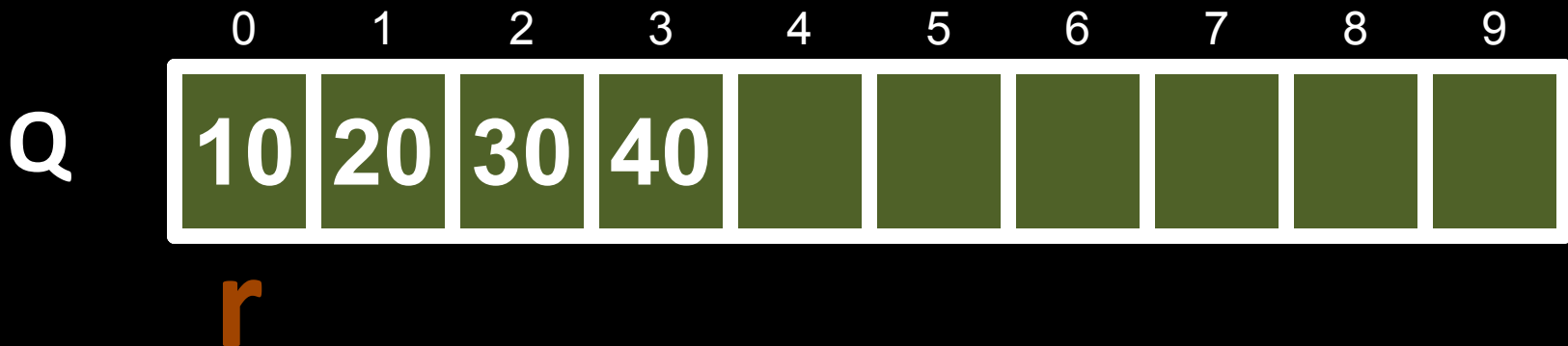
```
    }
```

```
    else
```

```
        printf("Queue is full !!!");
```

```
}
```

Queue is full !!!

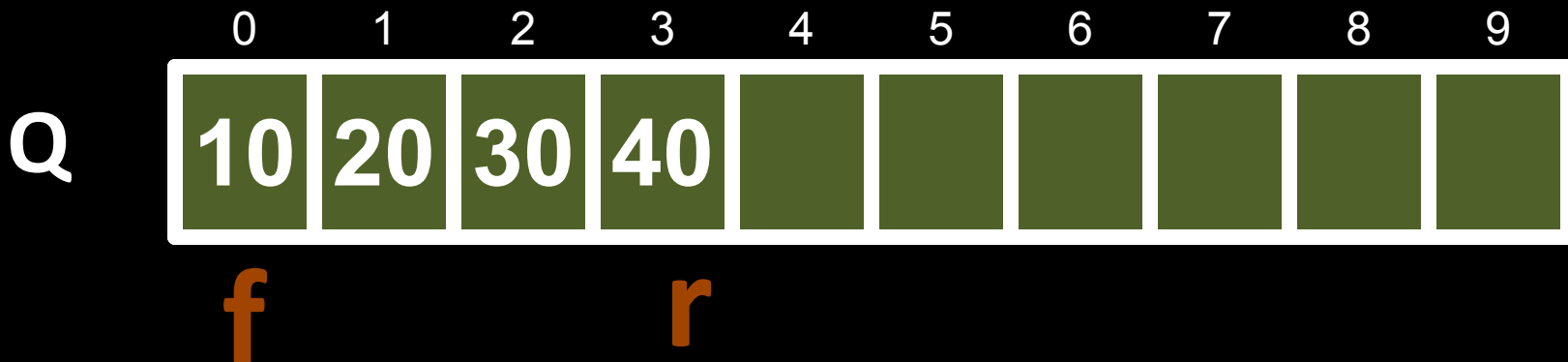


Deletion

n

```
deQueue( )
{
    if( front != rear )
    {
        front ++;
        printf("Element deleted successfully\n");
    }
    else
        printf("Queue is empty !!!");
}
```

Queue is empty !!!

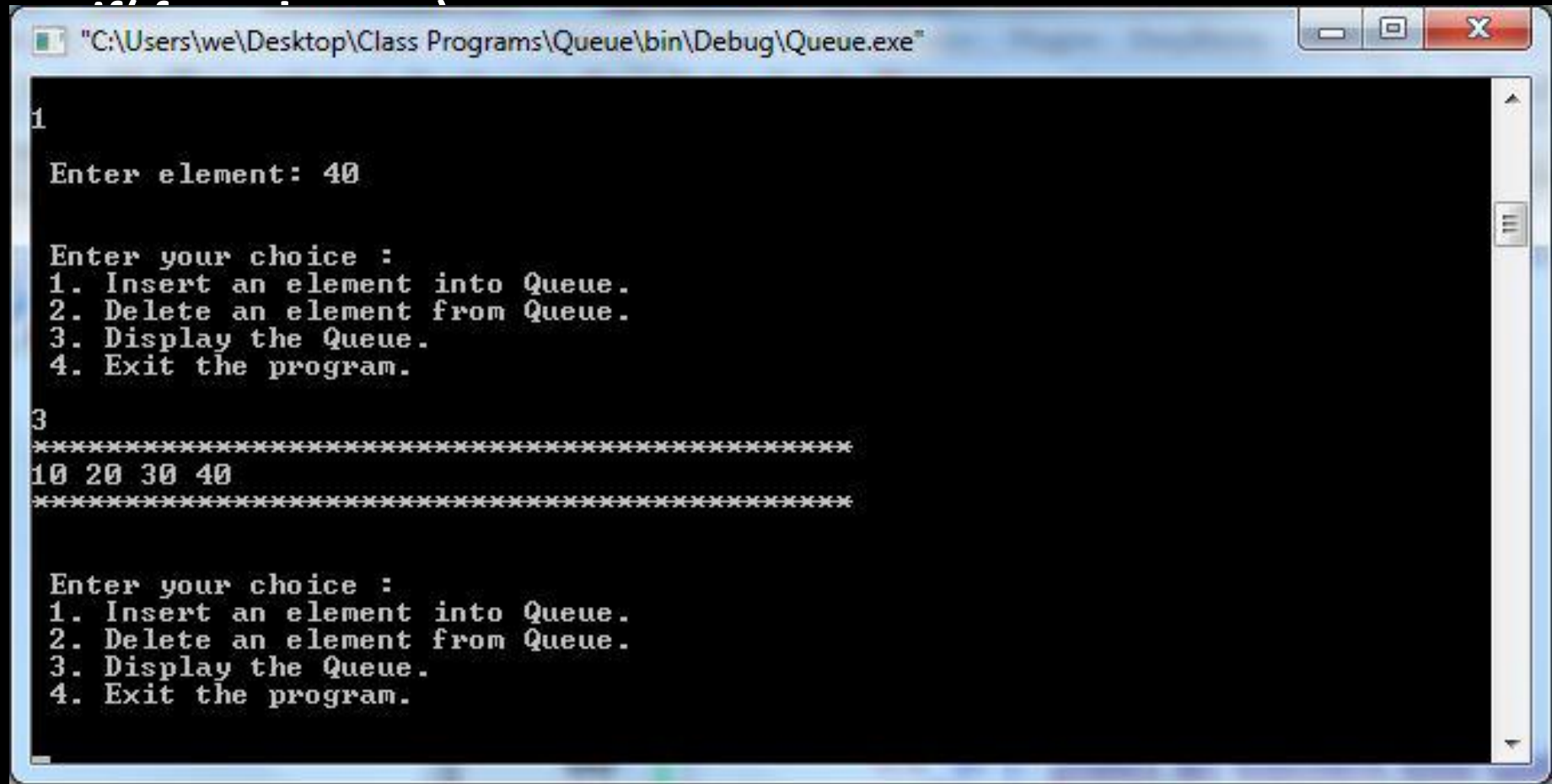


Displa

display()

{

y



The screenshot shows a Windows command prompt window titled "C:\Users\we\Desktop\Class Programs\Queue\bin\Debug\Queue.exe". The program is running and has prompted the user to "Enter element: 40". It then displays a menu with four options: 1. Insert an element into Queue., 2. Delete an element from Queue., 3. Display the Queue., and 4. Exit the program. The user has entered "3", and the program has displayed the contents of the queue: "10 20 30 40". The program then prompts the user to "Enter your choice :" again, with the same menu options.

```
"C:\Users\we\Desktop\Class Programs\Queue\bin\Debug\Queue.exe"

1
Enter element: 40

Enter your choice :
1. Insert an element into Queue.
2. Delete an element from Queue.
3. Display the Queue.
4. Exit the program.

3
*****
10 20 30 40
*****

Enter your choice :
1. Insert an element into Queue.
2. Delete an element from Queue.
3. Display the Queue.
4. Exit the program.
```