
# Mohammad Ali Jinnah University

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# Lab Task 7

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**Subject:** Data Structures and Algorithms Lab (CS 2511)

**Lab Title:** Queue

**Section:** AM

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## Q1) Create your own queue class with following methods:

## --> Enqueue

## --> Dequeue

## --> Get_Front

## --> Get_Rear

## Code:

```
import java.util.Arrays;
import java.util.Scanner;

public class Queue {
    public int SIZE,front, rear;
    public int[] items;

    Queue(int Size) {
        this.SIZE = Size;
        this.front = this.rear = -1;
        this.items = new int[SIZE];
    }

    String Get_Front(){
        return this.front+" = "+this.items[front];
    }

    String Get_Rear(){
        return  this.rear+" = "+this.items[rear];
    }

    boolean isFull() {
        if (front == 0 && rear == SIZE - 1) {
            return true;
        }
        return false;
    }

    // check if the queue is empty
    boolean isEmpty() {
        if (front == -1)
            return true;
        else
            return false;
    }

    // insert elements to the queue
    void enQueue(int element) {
        // if queue is full
        if (isFull()) {
            System.out.println("Queue Is full");
```

```
        }
        else {
            if (front == -1) {
                front = 0;
            }

            rear++;
            items[rear] = element;
        }
    }

    // delete element from the queue
    int deQueue() {
        int element;

        if (isEmpty()) {
            System.out.println("Queue Is Empty");
            return (-1);
        }
        else {
            element = items[front];

            if (front >= rear) {
                front = -1;
                rear = -1;
                items = new int[this.SIZE];
            }
            else {
                front++;
                items = Arrays.copyOfRange(items, 1, rear+1);
                items = Arrays.copyOf(items, this.SIZE);
                rear--;
            }

            return (element);
        }
    }


    String display() {
        String temp = "{";
        if (isEmpty()){
            temp += " }";
            return temp;
        }

        for (int i = 0; i <= rear; i++) {
            temp += items[i]+",";
        }
        temp += "\b}";
        return temp;
    }

    public static void main(String[] args) {
        System.out.println("Q1) Create your own queue class with following methods: (Enqueue, Dequeue, Get_Front,
Get_Rear");
```

```
    Queue q = new Queue(8);

    for(int i = 1; i < 9; i ++) {
        q.enQueue(i);
    }

    System.out.println("Queue"+q.display());
    System.out.println("Dequeue: "+q.deQueue());
    q.enQueue(9);
    System.out.println("Enqueue:"+q.display());
    System.out.println("Get_Front: "+q.Get_Front()+", Get_Rear: "+q.Get_Rear());
}
```

## Output:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program Files\JetBrains\IntelliJ
Q1) Create your own queue class with following methods: (Enqueue, Dequeue, Get_Front, Get_Rear
Queue{1,2,3,4,5,6,7,8}
Dequeue: 1
Enqueue:{2,3,4,5,6,7,8,9}
Get_Front: 1 = 3, Get_Rear: 7 = 9

Process finished with exit code 0
```

## Q2) Delete User given number from a queue.

## Code:

```
class Queue2 extends Queue{

   Scanner scan = new Scanner(System.in);
   Queue2(int size){
      super(size);
   }

   int Delete(int Element){
      boolean flag = false;
      if (isEmpty()){
         System.out.println("Queue Is Empty");
         return (-1);
      }
      int length = rear-front;
      for (int i = length; i > 0; i--) {
         if(items[i] == Element){
            items[i] = items[i-1];
            items[i-1] = Element;
         }
      }

      if(flag){
         System.out.print("Number not found in the Queue (Error: ");
         return (-1);
      }

      return this.deQueue();
   }

   void Input(){
      System.out.print("Enter the Complete Array(separate with ,): ");
      String input[] = (scan.next()).split(",");

      for (int i = 0; i < input.length; i++)
         this.enQueue(Integer.parseInt(input[i]));
   }

   public static void main(String[] args) {
      Queue2 obj = new Queue2(8);
      obj.Input();
      System.out.println(obj.display());
      System.out.print("Enter the number to delete from the queue: ");
      int element = obj.scan.nextInt();
      System.out.println("Delete: "+obj.Delete(element));
      System.out.println(obj.display());

   }
```

## Output:

```
"C:\Program Files\Java\jdk-13.0.2\bin\java.exe" "-javaagent:C:\Program
Enter the Complete Array(separate with ,): 1,2,3,4,5,7,8
{1,2,3,4,5,7,8}
Enter the number to delete from the queue: 4
Delete: 4
{1,2,3,5,7,8}

Process finished with exit code 0
```