

Stack :

```
package stackQueue;

public class Stack {
    // Stack implementation in Java

    private int arr[];
    private int top;
    private int capacity;

    // Creating a stack
    Stack(int size) {
        arr = new int[size];
        capacity = size;
        top = -1;
    }

    // Add elements into stack
    public void push(int x) {
        if (isFull()) {
            System.out.println("OverFlow\nProgram
Terminated\n");
            System.exit(1);
        }

        System.out.println("Inserting " + x);
        arr[++top] = x;
    }

    // Remove element from stack
    public int pop() {
        if (isEmpty()) {
            System.out.println("STACK EMPTY");
            System.exit(1);
        }
        return arr[top--];
    }
}
```

```

// Utility function to return the size of the stack
public int size() {
    return top + 1;
}

// Check if the stack is empty
public Boolean isEmpty() {
    return top == -1;
}

// Check if the stack is full
public Boolean isFull() {
    return top == capacity - 1;
}

public void printStack() {
    for (int i = 0; i <= top; i++) {
        System.out.println(arr[i]);
    }
}

public static void main(String[] args) {
    Stack stack = new Stack(5);

    stack.push(1);
    stack.push(2);
    stack.push(3);
    stack.push(4);

    stack.pop();
    System.out.println("\nAfter popping out");

    stack.printStack();
}
}

```

```
demoClass.java factorial.java factorial.java LinkedList.java package-info... *Stack.java x 24
1 package stackQueue;
2
3 public class Stack {
4     // Stack implementation in Java
5
6     private int arr[];
7     private int top;
8     private int capacity;
9
10    // Creating a stack
11    Stack(int size) {
12        arr = new int[size];
13        capacity = size;
14        top = -1;
15    }
16
17    // Add elements into stack
18    public void push(int x) {
19        if (isFull()) {
20            System.out.println("OverFlow\nProgram Terminated\n");
21            System.exit(1);
22        }
23
24        System.out.println("Inserting " + x);
25        arr[++top] = x;
26    }
27
28    // Remove element from stack
29    public int pop() {
30        if (isEmpty()) {
31            System.out.println("STACK EMPTY");
32            System.exit(1);
33        }
34
35        return arr[top--];
36    }
37
38    // Utility function to return the size of the stack
39    public int size() {
40        return top + 1;
41    }
42
43    // Check if the stack is empty
44    public Boolean isEmpty() {
45        return top == -1;
46    }
47
48    // Check if the stack is full
49    public Boolean isFull() {
50        return top == capacity - 1;
51    }
52
53    public void printStack() {
54        for (int i = 0; i <= top; i++) {
55            System.out.println(arr[i]);
56        }
57    }
58
59    public static void main(String[] args) {
60        Stack stack = new Stack(5);
61
62        stack.push(1);
63        stack.push(2);
64        stack.push(3);
65        stack.push(4);
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67        stack.pop();
68        System.out.println("\nAfter popping out");
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```

QUEUE:

```
package stackQueue;

public class Queue {
    // Queue implementation in Java

    int SIZE = 5;
    int items[] = new int[SIZE];
    int front, rear;

    Queue() {
        front = -1;
        rear = -1;
    }

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

    boolean isEmpty() {
        if (front == -1)
            return true;
        else
            return false;
    }

    void enqueue(int element) {
        if (isFull()) {
            System.out.println("Queue is full");
        } else {
            if (front == -1)
                front = 0;
            rear++;
            items[rear] = element;
        }
    }
}
```

```

        System.out.println("Inserted " + element);
    }
}

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;
        } /* Q has only one element, so we reset the queue
after deleting it. */
        else {
            front++;
        }
        System.out.println("Deleted -> " + element);
        return (element);
    }
}

void display() {
    /* Function to display elements of Queue */
    int i;
    if (isEmpty()) {
        System.out.println("Empty Queue");
    } else {
        System.out.println("\nFront index-> " + front);
        System.out.println("Items -> ");
        for (i = front; i <= rear; i++)
            System.out.print(items[i] + " ");

        System.out.println("\nRear index-> " + rear);
    }
}

```

```
public static void main(String[] args) {
    Queue q = new Queue();

    // deQueue is not possible on empty queue
    q.deQueue();

    // enqueue 5 elements
    q.enqueue(1);
    q.enqueue(2);
    q.enqueue(3);
    q.enqueue(4);
    q.enqueue(5);

    // 6th element can't be added to because the queue
is full
    q.enqueue(6);

    q.display();

    // deQueue removes element entered first i.e. 1
    q.deQueue();

    // Now we have just 4 elements
    q.display();
}
}
```

```

1 package stackQueue;
2
3 public class Queue {
4     // Queue implementation in Java
5
6
7     int SIZE = 5;
8     int items[] = new int[SIZE];
9     int front, rear;
10
11     Queue() {
12         front = -1;
13         rear = -1;
14     }
15
16     boolean isFull() {
17         if (front == 0 && rear == SIZE - 1) {
18             return true;
19         }
20         return false;
21     }
22
23     boolean isEmpty() {
24         if (front == -1)
25             return true;
26         else
27             return false;
28     }
29
30     void enqueue(int element) {
31         if (isFull()) {
32             System.out.println("Queue is full");
33         } else {
34             if (front == -1)
35                 front = 0;
36             rear++;
37             items[rear] = element;
38             System.out.println("Inserted " + element);
39         }
40     }
41
42     int dequeue() {
43         int element;
44         if (isEmpty()) {
45             System.out.println("Queue is empty");
46             return (-1);
47         } else {
48             element = items[front];
49             if (front >= rear) {
50                 front = -1;
51                 rear = -1;
52             } /* Q has only one element, so we reset the queue after delet
53             else {
54                 front++;
55             }
56             System.out.println("Deleted -> " + element);
57             return (element);
58         }
59     }
60 }

```

<terminated> Queue [Java Application] C:\Program Files\Java\j

Queue is empty
 Inserted 1
 Inserted 2
 Inserted 3
 Inserted 4
 Inserted 5
 Queue is full

Front index-> 0
 Items ->
 1 2 3 4 5
 Rear index-> 4
 Deleted -> 1

Front index-> 1
 Items ->
 2 3 4 5
 Rear index-> 4

Queue is empty
 Inserted 1
 Inserted 2
 Inserted 3
 Inserted 4
 Inserted 5
 Queue is full

Front index-> 0
 Items ->
 1 2 3 4 5
 Rear index-> 4
 Deleted -> 1

Front index-> 1
 Items ->
 2 3 4 5
 Rear index-> 4

Writable

Smart Insert

15:1:213

ENG

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