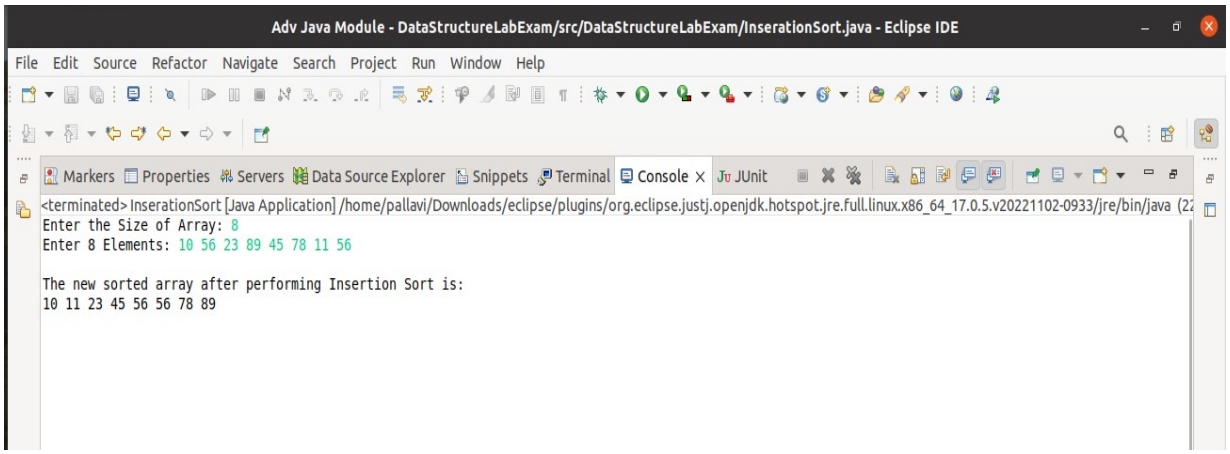
LAB EXAM

DATA STRUCTURE AND ALGORITHMS

Write a Java program to
a. Perform insertion sort

```
package DataStructureLabExam;
import java.util.Scanner;
public class InserationSort {

        public static void main(String[] args)
        {
          int n, i, j, element;
          Scanner sn = new Scanner(System.in);

          System.out.print("Enter the Size of Array: ");
          n = sn.nextInt();
          int[] arr = new int[n];
          System.out.print("Enter " +n+ " Elements: ");
          for(i=0; i<n; i++)
            arr[i] = sn.nextInt();

          for(i=1; i<n; i++)
          {
            element = arr[i];

            for(j=(i-1); j>=0 && arr[j]>element; j--)
              arr[j+1] = arr[j];

            arr[j+1] = element;
          }

          System.out.println("\nThe new sorted array after performing Insertion Sort
is: ");
          for(i=0; i<n; i++)
            System.out.print(arr[i]+ " ");
        }
      }
```

Output:



b. Implement queue using array

```
package DataStructureLabExam;
import java.util.*;

public class QueueArray {
        static private int front, rear, capacity;
        static private int queue[];
        public QueueArray(int c) {
        front = 0;
        rear = 0;
        capacity = c;
        queue = new int[capacity];
        }
        // at the rear of the queue
        static void queueEnqueue(int data) {
        if (capacity == rear) {
        System.out.printf("\nQueue is full\n");
        return;
        }
        else {
        queue[rear] = data;
        rear++;
        }
        return;
        }
        // function to delete an element
```

```
static void queueDequeue() {
if (front == rear) {
System.out.printf("Queue is empty\n");
return;
}
else {
for (int i = 0; i < rear - 1; i++) {
queue[i] = queue[i + 1];
}
rear--;
}
return;
}
// print queue elements
static void queueDisplay()
{
int i;
if (front == rear) {
System.out.printf("Queue is Empty\n");
return;
}
for (i = front; i < rear; i++) {
System.out.printf(" %d ", queue[i]);
}
return;
}
}
```

```
package DataStructureLabExam;

public class QueueMain {
	public static void main(String[] args) {
		QueueArray q = new QueueArray(4);
		q.queueDisplay();
		// inserting elements in the queue
		q.queueEnqueue(22);
		q.queueEnqueue(33);
		q.queueEnqueue(44);
		q.queueEnqueue(55);
		// print Queue elements
		q.queueDisplay();
		// insert element in the queue
		q.queueEnqueue(66);
```

```
        // print Queue elements
        q.queueDisplay();
        q.queueDequeue();
        q.queueDisplay();
        }

    }
```

Output: