SORTING

Q1. Write a program to sort an array in descending order using bubble sort.
Input Array {3,5,1,6,0}
Output Array: {6, 5, 3, 1, 0}

```java
import java.util.Scanner;

public class q1 {

    static void printArray(int arr[]){
        for(int i = 0; i < arr.length; i++){
            System.out.printf(arr[i] + " ");
        }
        System.out.println();
    }

    static void bubbleSort(int []arr){

        int n = arr.length;
        for(int i = 0; i < arr.length-1; i++){
            for(int j = 0; j < arr.length - 1  - i; j++){
                if(arr[j] < arr[j+1]){
                    int temp = arr[j];
                    arr[j] = arr[j+1];
                    arr[j+1] = temp;
                }
            }
        }
        printArray(arr);
    }
```

```
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Array size");
        int l = sc.nextInt();

        int [] arr = new int[l];

        System.out.println("Enter elements");
        for(int i = 0; i < arr.length; i++){
            arr[i] = sc.nextInt();
        }
        bubbleSort(arr);
    }
}
```

Q2. WAP to sort an array in descending order using selection sort
Input Array {3,5,1,6,0}
Output Array: {6, 5, 3, 1, 0}

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

public class q2 {

    static void selectioSort(int arr[]){

        for(int i = 0;i < arr.length;i++){
            int minIdx = i;
            for(int j = i+1;j < arr.length;j++){
                if(arr[j] < arr[minIdx]){
                    minIdx = j;
                }
```

```
                if(minIdx != i){
                    int temp = arr[minIdx];
                    arr[minIdx] = arr[i];
                    arr[i] = temp;
                }
            }
        }
        System.out.println(Arrays.toString(arr));
    }

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Array size");
        int l = sc.nextInt();

        int [] arr = new int[l];

        System.out.println("Enter elements");
        for(int i = 0; i < arr.length; i++){
            arr[i] = sc.nextInt();
        }

        selectioSort(arr);
    }
}
```

Q3. WAP to sort an array in decreasing order using insertion sort
Input Array {3,5,1,6,0}
Output Array: {6, 5, 3, 1, 0}

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

```java
public class q3 {

    static void insertionSort(int arr[]){

        for(int i = 1; i < arr.length; i++){

            int j = i;
            while(j > 0 && arr[j] < arr[j-1]){
                int temp = arr[j];
                arr[j] = arr[j-1];
                arr[j-1] = temp;
                j--;
            }
        }
        System.out.println(Arrays.toString(arr));

    }

    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);

        System.out.println("Enter Array size");
        int l = sc.nextInt();

        int [] arr = new int[l];
```

```
        System.out.println("Enter elements");
        for(int i = 0; i < arr.length; i++){
            arr[i] = sc.nextInt();
        }

        insertionSort(arr);
    }
}
```

Q4. Find out how many pass would be required to sort the following array in decreasing order using bubble sort Input Array {3,5,1,6,0}

ANS. 3 iterations are required
Original Array is {3 5 1 6 0}
In first iteration array is {5 3 6 1 0}
In second iteration array is {5 6 3 1 0}
In third iteration array is {6 5 3 1 0}

Q5. Find out the number of iterations to sort the array in descending order using selection sort. Input Array {3,5,1,6,0}

Ans. 3 iterations are required.
Original Array is {3 5 1 6 0}
In first iteration array is {6 5 1 3 0}
In second iteration array is {6 5 1 3 0}
In third iteration array is {6 5 3 1 0}
Now the array is sorted.