Assignment

1. 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}

Ans:

```
import java.io.*;
 import java.util.*;
public class Sort {
// 0 based indexing used
public static void bubbleSort(int[] a) {
int n = a.length;


 for (int i = 0; i < n; i++) {
boolean flag = false;


for (int j = 0; j < n - i - 1; j++) {
   if (a[j] < a[j + 1]) {
      flag = true;
      // swap the values of a[j] and a[j+1]
      int temp = a[j];
      a[j] = a[j + 1];
      a[j + 1] = temp;
   }
}
// No Swapping happened, array is sorted
if (!flag) {
   return;
}
  }
}
public static void main(String[] args) {
  Scanner sc = new Scanner(System.in);
```

```
        System.out.println("Enter the size of array");
        int n = sc.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter the elements of array");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }
        bubbleSort(arr);
        for (int i = 0; i < n; i++) {
            System.out.print(arr[i] + " ");
        }
    }
}
```

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}

Ans:

```
import java.io.*;
import java.util.*;

public class Sort {
    // 0 based indexing used
    public static void selectionSort(int[] a) {
        int n = a.length;

        for (int i = 0; i < n - 1; i++)
        // i represents the current index
        {
```

```
        // Find the maximum element in unsorted part of the array
        int max_index = i;
        for (int j = i + 1; j < n; j++) {
            if (a[j] > a[max_index])
                max_index = j;
        }

        // Swap the found maximum element with the current element
        if (max_index != i) {
            int temp = a[max_index];
            a[max_index] = a[i];
            a[i] = temp;
}
    }
  }

  public static void main(String[] args) {
    Scanner sc = new Scanner(System.in);
    System.out.println("Enter the size of array");
    int n = sc.nextInt();
    int[] arr = new int[n];
    System.out.println("Enter the elements of array");
    for (int i = 0; i < n; i++) {
        arr[i] = sc.nextInt();
    }
    selectionSort(arr);
    for (int i = 0; i < n; i++) {
        System.out.print(arr[i] + " ");
    }
    System.out.print("\n");
```

```
    }
}
```

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}

Ans:

```
import java.io.*;
import java.util.*;

public class Sort {
    public static void insertionSort(int[] a) {
        int n = a.length;

        for (int i = 1; i < n; i++) {
            int j = i;

            // Insert a[i] into sorted left part 0..i-1
            while (j > 0 && a[j] > a[j - 1]) {

                // Swap a[j] and a[j-1]
                int temp = a[j];
                a[j] = a[j - 1];
                a[j - 1] = temp;

                // Decrement j by 1
                j--;
            }
        }
    }

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

```
        Scanner sc = new Scanner(System.in);
        System.out.println("Enter the size of array");
        int n = sc.nextInt();
        int[] arr = new int[n];
        System.out.println("Enter the elements of array");
        for (int i = 0; i < n; i++) {
            arr[i] = sc.nextInt();
        }
        insertionSort(arr);
        for (int i = 0; i < n; i++) {
            System.out.print(arr[i] + " ");
        }
         System.out.print("\n ");
    }
}
```

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: 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: 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.