Assignment 2

Rudraksh Kavishwar
PRN 23070126511
AIML (B3)

Q.1 W.a.p that declares two arrays named ‘even’ and ‘odd’. Accept numbers from the user and move them to respective arrays depending on whether they are even or odd.

Main.java

```
import java.util.Scanner;

public class Main {
   public static void main(String[] args) {
      Scanner scanner = new Scanner(System.in);

      System.out.print("Enter the number of elements: ");
      int n = scanner.nextInt();

      int[] numbers = new int[n];
      System.out.println("Enter the elements:");

      for (int i = 0; i < n; i++) {
         numbers[i] = scanner.nextInt();
      }

      EvenOddArray evenOddArray = new EvenOddArray();
      evenOddArray.sortEvenOdd(numbers);

      System.out.println("Even numbers:");
      evenOddArray.displayEvenNumbers();

      System.out.println("Odd numbers:");
```

```
        evenOddArray.displayOddNumbers();

        scanner.close();
    }
}
```

EvenOddArray.java

```
public class EvenOddArray {
    private int[] even;
    private int evenCount;
    private int[] odd;
    private int oddCount;

    public EvenOddArray() {
        even = new int[100]; // Assuming a maximum of 100 elements
        odd = new int[100];
        evenCount = 0;
        oddCount = 0;
    }

    public void sortEvenOdd(int[] numbers) {
        for (int num : numbers) {
            if (num % 2 == 0) {
                even[evenCount++] = num;
            } else {
                odd[oddCount++] = num;
            }
        }
    }

    public void displayEvenNumbers() {
        for (int i = 0; i < evenCount; i++) {
            System.out.print(even[i] + " ");
        }
        System.out.println();
    }
```

```
    public void displayOddNumbers() {
        for (int i = 0; i < oddCount; i++) {
            System.out.print(odd[i] + " ");
        }
        System.out.println();
    }
}
```

```
Enter the number of elements: 5
Enter the elements:
99
45
44
12
04
Even numbers:
44 12 4
Odd numbers:
99 45
```

Q.2 Implement a java function that finds 2 neighboring numbers in an array with the smallest distance to each. The function should return the index of the 1st number.

Main.java

```
public class Main {
    public static void main(String[] args) {
        int[] array = {5, 10, 3, 8, 15}; // Example array
        NearestNeighbors nn = new NearestNeighbors();
        int nearestIndex = nn.findNearest(array);
        if (nearestIndex != -1) {
            System.out.println("Nearest neighbors found at indices: " + nearestIndex + "
and " + (nearestIndex + 1));
            System.out.println("Nearest neighbors are: " + array[nearestIndex] + " and " +
array[nearestIndex + 1]);
        } else {
            System.out.println("Array has less than 2 elements.");
        }
    }
}
```

NearestNeighbors.java

```
public class NearestNeighbors {
    public int findNearest(int[] arr) {
        if (arr == null || arr.length < 2) {
            // Return -1 if the array is null or has less than 2 elements
            return -1;
        }

        int minDistance = Integer.MAX_VALUE;
        int nearestIndex = -1;

        for (int i = 0; i < arr.length - 1; i++) {
```

```
            int distance = Math.abs(arr[i] - arr[i + 1]);
            if (distance < minDistance) {
                minDistance = distance;
                nearestIndex = i;
            }
        }

        return nearestIndex;
    }
}
```

```
Nearest neighbors found at indices: 0 and 1
Nearest neighbors are: 5 and 10
```

3. Write a Java program to convert an array into ArrayList and vice Versa.

Main.java

```
import java.util.ArrayList;
import java.util.Arrays;

public class Main {
    public static void main(String[] args) {
        // Convert array to ArrayList
        Integer[] array = {1, 2, 3, 4, 5};
        ArrayList<Integer> arrayList = ArrayToArrayList.convertArrayToArrayList(array);
        System.out.println("ArrayList from array: " + arrayList);

        // Convert ArrayList to array
        ArrayList<String> strArrayList = new ArrayList<>();
        strArrayList.add("apple");
        strArrayList.add("banana");
        strArrayList.add("orange");
        String[] strArray = strArrayList.toArray(new String[0]);
        System.out.print("Array from ArrayList: ");
        for (String str : strArray) {
            System.out.print(str + " ");
        }
        System.out.println();
    }
}
```

ArrayToArrayList.java

```
import java.util.ArrayList;
import java.util.Arrays;

public class ArrayToArrayList {
    public static ArrayList<Integer> convertArrayToArrayList(Integer[] array) {
```

```
        return new ArrayList<>(Arrays.asList(array));
    }

    public static Integer[] convertArrayListToArray(ArrayList<Integer> arrayList) {
        return arrayList.toArray(new Integer[0]);
    }
}
```

```
ArrayList from array: [1, 2, 3, 4, 5]
Array from ArrayList: apple banana orange
```