Name- Samarth Sandesh Bhadane
Batch- A2
PRN- 24070126503

PIJL Assignment-2: Arrays and ArrayLists

Aim:

1. To write a program 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.
2. To Implement a java function that finds 2 neighbouring numbers in an array with the smallest distance to each. The function should return the index of the 1st number.
3. To write a Java program to convert an array into ArrayList and vice versa.

This Document contains code for the following files:

- ArrayConverter.java
- EvenOddSeparator.java
- SmallestDistanceFinder.java
- Main.java

1. ArrayConverter.java

```java
import java.util.*;

public class ArrayConverter {
    // Convert array to ArrayList
    public ArrayList<Integer> arrayToArrayList(int[] array) {
        ArrayList<Integer> list = new ArrayList<>();
        for (int num : array) {
            list.add(num);
        }
        return list;
    }

    // Convert ArrayList back to array
    public int[] arrayListToArray(ArrayList<Integer> list) {
        int[] array = new int[list.size()];
        for (int i = 0; i < list.size(); i++) {
            array[i] = list.get(i);
        }
        return array;
    }
}
```

2. EvenOddSeperator.java

```java
import java.util.*;

public class EvenOddSeparator {
    // Method to separate even and odd numbers
    public void separate(int[] numbers) {
        List<Integer> even = new ArrayList<>();
        List<Integer> odd = new ArrayList<>();

        for (int num : numbers) {
            if (num % 2 == 0) {
                even.add(num);
            } else {
                odd.add(num);
            }
        }

        System.out.println("Even numbers: " + even);
        System.out.println("Odd numbers: " + odd);
    }
}
```

3. SmallestDistanceFinder.java

```java
public class SmallestDistanceFinder {
    // Method to find the smallest distance between neighboring elements
    public int findSmallestDistance(int[] numbers) {
        if (numbers.length < 2) return -1;

        int minDistance = Math.abs(numbers[1] - numbers[0]);
        int index = 0;

        for (int i = 1; i < numbers.length - 1; i++) {
            int distance = Math.abs(numbers[i + 1] - numbers[i]);
            if (distance < minDistance) {
                minDistance = distance;
                index = i;
            }
        }
        return index;
    }
}
```

4. Main.java

```java
import java.util.*;

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

        // Taking user input for numbers using for loop
        System.out.print("Enter the number of elements: ");
        int n = scanner.nextInt();
        int[] numbers = new int[n];

        System.out.println("Enter " + n + " numbers:");
        for (int i = 0; i < n; i++) {
            numbers[i] = scanner.nextInt();
        }

        // Even and Odd Separator
        EvenOddSeparator separator = new EvenOddSeparator();
        separator.separate(numbers);

        // Finding Smallest Distance
        SmallestDistanceFinder distanceFinder = new SmallestDistanceFinder();
        int index = distanceFinder.findSmallestDistance(numbers);
        if (index != -1) {
            System.out.println("Smallest distance is between indices: " + index + " (" +
numbers[index] + ") and " + (index + 1) + " (" + numbers[index + 1] + ")");
        } else {
            System.out.println("Not enough elements to find a distance.");
        }

        // Array to ArrayList and Vice Versa
        ArrayConverter converter = new ArrayConverter();
        ArrayList<Integer> arrayList = converter.arrayToArrayList(numbers);
        System.out.println("Array converted to ArrayList: " + arrayList);
        int[] convertedArray = converter.arrayListToArray(arrayList);
        System.out.println("ArrayList converted back to Array: " +
Arrays.toString(convertedArray));

        scanner.close();
    }
}
```

GitHub Repository Link-
https://github.com/samarthsb4real/PIJL/tree/master/Assignment-2