Assignment 2

Part 1: Write a Java 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.

Github Link: https://github.com/manan3044/Assignment_2

Code

1) Main.java

```
package Assignment2P1;

public class Main {
    private static void print(float[] arr, int count)
    {
        for (int i=0;i <count; i++)
        {
            System.out.println(""+arr[i]);
        }
    }

    public static void main(String[] args) {
        input inp = new input();
        numCheck check = new numCheck();

        int totalNumbers = inp.totalNumber();
        int evenCount=0, oddCount=0;

        float[] even = new float[totalNumbers];
        float[] odd = new float[totalNumbers];

        for(int i=0; i<totalNumbers; i++)
        {
            float number = inp.inputNumber();

            String numType = check.checker(number);
            if (numType.equals("Even"))
            {
                even[evenCount] = number;
                evenCount++;
            }

            else
            {
                odd[oddCount] = number;
                oddCount++;
            }
        }
        System.out.println("Even Numbers: ");
        print(even, evenCount);
```

```
        System.out.println("\nOdd Numbers: ");
        print(odd, oddCount);
    }
}
```

2)input.java

```
package Assignment2P1;
import java.util.Scanner;

public class input {
    Scanner sc = new Scanner(System.in);
    public int totalNumber()
    {
        System.out.print("How many number do you want to enter: ");

        return sc.nextInt();
    }
    public float inputNumber()
    {
        System.out.print("Enter your number: ");

        return sc.nextFloat();
    }
}
```

3)numCheck.java

```
package Assignment2P1;

public class numCheck {
    public String checker(float num)
    {
        if (num%2 == 0)
        {
            return "Even";
        }

        else {
            return  "Odd";
        }
    }
}
```

Output

```
How many number do you want to enter: 6
Enter your number: 22
Enter your number: 62
Enter your number: 69
Enter your number: 420
Enter your number: 762341
Enter your number: 23
Even Numbers:
22.0
62.0
420.0

Odd Numbers:
69.0
762341.0
23.0
```

Part 2: Implement a Java method that finds two neighboring numbers in an array with the smallest distance to each. The function should return the index of the 1st number.

Code:

1)Main.java

```
package Assignment2P2;

public class Main {

    private static void print(int[] arr, int count)
    {
        for (int i=0;i <count; i++)
        {
            System.out.println(""+arr[i]);
        }
    }

    public static void main(String[] args) {
        input inp = new input();
        distance dis = new distance();

        int totalNumbers = inp.totalNumber();

        int[] arr = inp.inputNumbers(totalNumbers);

        System.out.println("\nThe array you entered: ");
        print(arr, totalNumbers);

        int[] distanceArr = dis.distanceBetween(arr,
totalNumbers);

        System.out.println("\nDistance between neighbouring
element: ");
        print(distanceArr, totalNumbers-1);

        int min = dis.minDistance(distanceArr, totalNumbers);

        System.out.println("\nThe index of the first number with
least distance with neighbor = "+min);
    }
}
```

2)input.java

```
package Assignment2P2;
import java.util.Scanner;

public class input {
    Scanner sc = new Scanner(System.in);
```

```
    public int totalNumber()
    {
        System.out.print("How many number do you want to enter:
");

        return sc.nextInt();
    }
    public int[] inputNumbers(int totalNums)
    {
        int[] arr = new int[totalNums];

        for(int i=0; i<totalNums;i++)
        {
            System.out.print("Enter your number: ");
            arr[i] = sc.nextInt();
        }

        return arr;
    }
}
```

3)distance.java

```
package Assignment2P2;

public class distance {
    public int[] distanceBetween(int[] arr, int totalNums)
    {
        int[] dist = new int[totalNums-1];

        for(int i=0; i<totalNums-1; i++)
        {
            dist[i] = arr[i] - arr[i+1];
            dist[i] = Math.abs(dist[i]);
        }

        return dist;
    }

    public int minDistance(int[] distArr, int totalNums)
    {
        int minimumIndex = 0;
        int minimumDistance = distArr[0];

        for(int i=0; i<totalNums-1; i++)
        {
            if ((distArr[i] < minimumDistance))
            {
                minimumIndex = i;
            }
        }

        return minimumIndex;
```

```
    }
}
```

Output

```
How many number do you want to enter: 5
Enter your number: 1
Enter your number: 4
Enter your number: 8
Enter your number: 12
Enter your number: 19

The array you entered:
1
4
8
12
19

Distance between neighbouring element:
3
4
4
7

The index of the first number with least distance with neighbor = 0
```

Part 3: Write a Java program to convert an array into ArrayList and vice versa.

Code:

1)Main.java

```
package Assignment2P3;
import java.util.ArrayList;
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {

        Scanner sc = new Scanner(System.in);
        input inp = new input();
        converter cnv = new converter();

        System.out.print("Which operation do you want to
perform\n1) Array to ArrayList\n2) ArrayList to Array\n=");
        int choice = sc.nextInt();

        int totalNumbers = inp.totalNumber();

        if (choice == 1)
        {
            int[] arr = inp.arrayInput(totalNumbers);
            ArrayList<Integer> convt_arrList =
cnv.arrayTOarrayList(arr);
            System.out.println("\nThe type in which data is
stored when input: "+arr.getClass().getSimpleName());
            System.out.println("The type after conversion:
"+convt_arrList.getClass().getSimpleName()+"\n\nArrayList: ");

            for (Integer integer : convt_arrList) {
                System.out.println(integer);
            }
        }

        else if (choice == 2)
        {
            ArrayList<Integer> arrlist =
inp.arrayListInput(totalNumbers);
            Integer[] convt_arr = cnv.arrayListTOarray(arrlist);
            System.out.println("\nThe type in which data is
stored when input: "+arrlist.getClass().getSimpleName());
            System.out.println("The type after conversion:
"+convt_arr.getClass().getSimpleName()+"\n\nArray: ");

            for (Integer integer : convt_arr) {
                System.out.println(integer);
            }
        }
```

```
        else{
            System.out.println("Invalid Option");
        }
    }
}
```

2) input.java

```
package Assignment2P3;
import java.util.ArrayList;
import java.util.Scanner;

public class input {
    Scanner sc = new Scanner(System.in);

    public int totalNumber()
    {
        System.out.print("How many number do you want to enter:
");

        return sc.nextInt();
    }
    public int[] arrayInput(int totalNums)
    {
        int[] arr = new int[totalNums];

        for(int i=0; i<totalNums;i++)
        {
            System.out.print("Enter your number: ");
            arr[i] = sc.nextInt();
        }

        return arr;
    }

    public ArrayList<Integer> arrayListInput(int totalNums)
    {
        ArrayList<Integer> arrList = new ArrayList<Integer>();

        for(int i=0; i<totalNums;i++)
        {
            System.out.print("Enter your number: ");
            arrList.add(sc.nextInt());
        }

        return arrList;
    }
}
```

3) converter.java

```java
package Assignment2P3;

import java.util.ArrayList;

public class converter {
    public Integer[] arrayListTOarray(ArrayList<Integer> arrlist)
    {
        return arrlist.toArray(new Integer[0]);
    }

    public ArrayList<Integer> arrayTOarrayList(int[] arr)
    {
        ArrayList<Integer> converted_arrlist = new ArrayList<>();

        for(int i: arr)
        {
            converted_arrlist.add(i);
        }

        return converted_arrlist;
    }
}
```

Output:

```
Which operation do you want to perform
1) Array to ArrayList
2) ArrayList to Array
=1
How many number do you want to enter: 3
Enter your number: 4
Enter your number: 5
Enter your number: 6

The type in which data is stored when input: int[]
The type after conversion: ArrayList

ArrayList:
4
5
6
```

```
Which operation do you want to perform
1) Array to ArrayList
2) ArrayList to Array
=2
How many number do you want to enter: 3
Enter your number: 6
Enter your number: 9
Enter your number: 8

The type in which data is stored when input: ArrayList
The type after conversion: Integer[]

Array:
6
9
8
```