JAVA ASSIGNMENT ASSIGNMENT-2 DATE:25-03-23

PROBLEM STATEMENT : Array_and_ArrayList

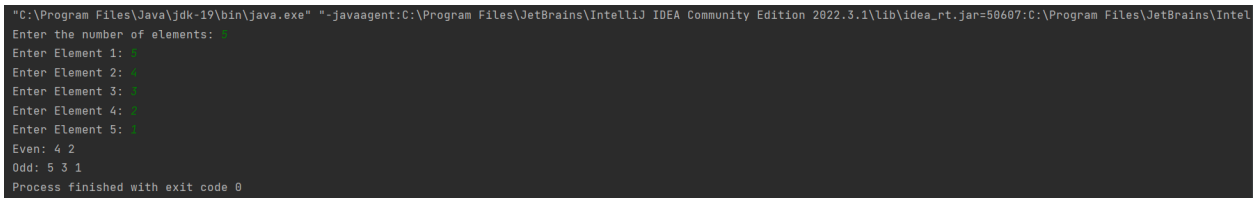
PROBLEM PART -1 : W.a.p that declares two arrays named ‘even’ and ‘odd’. Accept numbers from the user and move them to respective arrays depending on whether they are even or odd.

CODE:

```
/*
Problem Statement : 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.
Name - Nisarg Patel
PRN - 21070126060
Batch - AIML A3

LAB ASSIGNMENT - 2 Even Odd
*/



package Assignment_2;
import java.util.Scanner;
public class EvenOdd
{
   public static void main(String[] args) {
      ArrayEvenOdd eo = new ArrayEvenOdd(); // create object of class ArrayEvenOdd
      int num = eo.getNumOfElements(); // get number of elements from user input
      eo.checkEvenOdd(num); // separate even and odd numbers in the array
   }

}
// Class ArrayEvenOdd
class ArrayEvenOdd {
   // method to get number of elements from user input
   int getNumOfElements() {
      System.out.print("Enter the number of elements: ");
      return new Scanner(System.in).nextInt();
   }
```

```
    // method to separate even and odd numbers in the array
    void checkEvenOdd(int num) {
        int[] evenArr = new int[num]; // array for even numbers
        int[] oddArr = new int[num]; // array for odd numbers
        int countEven = 0; // counter for even numbers
        int countOdd = 0; // counter for odd numbers

        // loop to get input for each element and separate even and odd numbers
        for (int i = 0; i < num; i++) {
            System.out.print("Enter Element " + (i + 1) + ": ");
            int element = new Scanner(System.in).nextInt();

            if (element % 2 == 0) { // if the element is even
                evenArr[countEven] = element; // add to even array
                countEven++; // increment even counter
            } else { // if the element is odd
                oddArr[countOdd] = element; // add to odd array
                countOdd++; // increment odd counter
            }
        }

        // print even numbers
        System.out.print("Even: ");
        for (int i = 0; i < countEven; i++) {
            System.out.print(evenArr[i] + " ");
        }
        System.out.println();

        // print odd numbers
        System.out.print("Odd: ");
        for (int i = 0; i < countOdd; i++) {
            System.out.print(oddArr[i] + " ");
        }
    }
}
```

OUTPUT :



PROBLEM PART - 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.

CODE :

```
/*
Problem Statement : 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.
Name - Nisarg Patel
PRN - 21070126060
Batch - AIML A3

LAB ASSIGNMENT - 2 Closet Number
*/
package Assignment_2;

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


    // Return the index of the first number in the closest pair of numbers

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

      // Prompt the user to enter the number of elements in the array
      System.out.print("Enter the number of elements in the array: ");
      int n = scanner.nextInt();
      int[] arr = new int[n];

      // Prompt the user to enter the elements of the array
      System.out.println("Enter the elements of the array: ");
```

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

        // Sort the array in ascending order
        Arrays.sort(arr);

        // Call the findClosestNumbers function to find the index of the first number in the closest
pair of numbers
        int index = findClosestNumbers(arr);

        // Print the closest pair of numbers and their index
        System.out.println("The closest pair of numbers is: " + arr[index] + " and " + arr[index + 1]);
        System.out.println("The index of the first number in the closest pair of numbers is: " +
index);
    }


    public static int findClosestNumbers(int[] arr) {
        // Initialize the minimum difference and the index to the first two elements in the array
        int minDiff = Math.abs(arr[1] - arr[0]);
        int index = 0;

        // Iterate through the array and compare each number with its neighbor
        for (int i = 1; i < arr.length - 1; i++) {
            int diff = Math.abs(arr[i + 1] - arr[i]);

            // Update the minimum difference and the index if a smaller difference is found
            if (diff < minDiff) {
                minDiff = diff;
                index = i;
            }

        }
        return index;
    }
}
```

OUTPUT :

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

CODE :

```
/*
Problem Statement : Write a Java program to convert an array into ArrayList and vice versa.
Name - Nisarg Patel
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LAB ASSIGNMENT - 2 Convert_Array
*/
package Assignment_2;
import java.util.ArrayList;
public class Convert_Array {
    public static void main(String[] args) {
        ConvertArrayAndArrayList converter = new ConvertArrayAndArrayList();
        converter.convertToArray();    // call method to convert array list to array
        converter.convertToArrayList();    // call method to convert array to array list
    }
}
class ConvertArrayAndArrayList {
    void convertToArrayList() {    // Method to convert array to array list
        int[] arr = {6, 7, 8, 9, 10};
        ArrayList<Integer> arrayList = new ArrayList<Integer>();
        for (int i = 0; i < arr.length; i++) {
            arrayList.add(arr[i]);
        }
        System.out.println(arrayList);    // print array list
        System.out.println("Type: " + ((Object)arrayList).getClass().getSimpleName());    // print
type of array list
        System.out.println("\n");
```
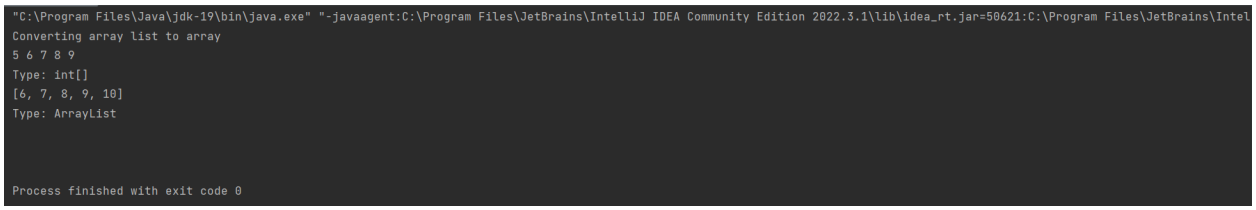

```
    }

    void convertToArray() {    // Method to convert array list to array
        ArrayList<Integer> arrayList = new ArrayList<Integer>();
        for (int i= 5 ; i < 10; i++) {
            arrayList.add(i);
        }
        int[] arr = new int[arrayList.size()];
        for (int i = 0; i < arrayList.size(); i++) {
            arr[i] = arrayList.get(i);
        }
        System.out.println("Converting array list to array");
        for (int i = 0; i < arr.length; i++) {
            System.out.print(arr[i] + " ");    // print each element of the array
        }
        System.out.println();
        System.out.println("Type: " + ((Object)arr).getClass().getSimpleName());    // print type of
array
    }
}
```

OUTPUT :



GitHub Repository: https://github.com/SnakeEyes1308/Java-Assignment-