Java Lab 2

Assignment 2

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Part 1: Write a program to 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. Print the contents of both the arrays.

Code:

```
/*
Date: 09/02/2023
Lab Assignment 2 - Part 1
PRN : 21070126039
Name : Jainil Patel
Batch : AIML A2

Problem Statement : Write a program to 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. Print the contents of both the arrays.
*/



//Importing
import java.util.Scanner;


//Main class
public class EvenOdd {

    public static void main(String[] args)
    {
        ArrayEvenOdd EvenOdd = new ArrayEvenOdd() ;
//creating object of class ArrayEO
        int num = EvenOdd.getNumberOfElements();                                    //calling
no_of_elements method
        EvenOdd.checkEvenOdd(num);
//calling arreo method
    }
}


//Class ArrayEO
class ArrayEvenOdd
{
    int getNumberOfElements()                                                       //method
to take input of no of elements
    {
        System.out.print("Enter the no of elements :");
        return new Scanner(System.in).nextInt();
    }

    void checkEvenOdd(int num)                                          //method to move the
elements to respective arrays
    {
        int[] even = new int[num]  ;                            //declaring two arrays
        int[] odd =  new int[num] ;                             //declaring two arrays

        int countEven = 0 ;                                        //declaring and initializing
counte and counto
        int countOdd = 0 ;

        for (int i = 0; i < num ; i++)                          //loop to take input of
elements
        {
```

```
            System.out.print("Enter Element" + (i+1) + ":");
            int element = new Scanner(System.in).nextInt() ;

            if(element%2 == 0)                              //even or odd
            {

                even[countEven] = element ;
                countEven++ ;
            }
            else
            {
                odd[countOdd] = element ;
                countOdd++ ;
            }

        }
        System.out.print("Even : ");
        for (int i = 0; i < countEven ; i++)    //loop to print the elements of even array
        {
            System.out.print(even[i] + " ");
        }
        System.out.println();
        System.out.print("Odd : ");

        for (int i = 0; i < countOdd ; i++)     //loop to print the elements of odd array
        {
            System.out.print(odd[i]  + " ");
        }
    }

}
```

Output (Test Case):

```
Enter the no of elements :7
Enter Element 1:8
Enter Element 2:99
Enter Element 3:3
Enter Element 4:0
Enter Element 5:1
Enter Element 6:443
Enter Element 7:3
Even : 8 0
Odd : 99 3 1 443 3
```

Part 2: Write a program to find the two numbers with the smallest distance between them in an array of integers. The program should also print the index of the first number.

Code:

```
import java.util.Scanner;

public class ClosestNumbers {
    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();
        }
        // 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 0
        int minDiff = Integer.MAX_VALUE;
        int index = 0;
        // Iterate through the array and compare each number with its neighbor
        for (int i = 1; i < arr.length; i++) {
            int diff = Math.abs(arr[i] - arr[i - 1]);
            // Update the minimum difference and the index if a smaller difference is found
            if (diff < minDiff) {
                minDiff = diff;
                index = i - 1;
            }
        }
        // Return the index of the first number in the closest pair of numbers
        return index;
    }
}
```

Output (Test Case):

```
Enter the number of elements in the array: 8
Enter the elements of the array:
8
7
5
3
5
5
7
7
The closest pair of numbers is: 5 and 5
The index of the first number in the closest pair of numbers is: 4
```

Part 3: Write a program to find the two numbers with the smallest distance between them in an array of integers. The program should also print the index of the first number.

Code:

```
/*
Date: 09/02/2023
Lab Assignment 2 - Part 3
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Batch : AIML A2

Problem Statement : Write a Java program to convert an array into ArrayList and vice-versa.

*/


// Importing
import java.util.ArrayList;


// Main class
public class ConvertArrays
{
    public static void main(String[] args)
    {
        ConvertArrayAndArrayList converter = new ConvertArrayAndArrayList();
// Creating object of class ConvertArrayAndArrayList
        converter.toArrayList();
// Calling method toArrayList()
        converter.toArray();
// Calling method toArray()
    }
}

// Class Convert
class ConvertArrayAndArrayList
{
    void toArrayList()                          // Method to convert array to array list
    {
        System.out.println("Converting array to array list");
        int[] array_ = {1, 2, 3, 4, 5};
        ArrayList<Integer> arrayList_ = new ArrayList<Integer>();
        for (int i = 0; i < array_.length; i++)
        {
            arrayList_.add(array_[i]);
        }


        System.out.println(arrayList_);
        System.out.println("Type: " + ((Object)arrayList_).getClass().getSimpleName());
        System.out.println("\n");
    }

    void toArray()                                  // Method to convert array list to array
    {
        //array list into array
        ArrayList<Integer> arrayList_ = new ArrayList<Integer>();
        for (int i= 0 ; i < 5; i++)
        {
            arrayList_.add(i);
        }
        int[] array_ = new int[arrayList_.size()];

        for (int i = 0; i < arrayList_.size(); i++)
        {
            array_[i] = arrayList_.get(i);
        }
        System.out.println("Converting array list to array");
```

```
        for (int i = 0; i < array_.length; i++)
        {
            System.out.print(array_[i] + " ");
        }

        System.out.println();
        System.out.println("Type: " + ((Object)array_).getClass().getSimpleName());

    }
}
```

Output (Test Case):

```
Converting array to array list
[1, 2, 3, 4, 5]
Type: ArrayList


Converting array list to array
0 1 2 3 4
Type: int[]
```

GitHub Repository: https://github.com/astro215/SIT/tree/main/Java%20Lab/Lab_2