

Java Assignment 2

Sahil Goyal

AIML-B1

22070126094

2022-26

Q1 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.

Code:

```
// UserInput.java

import java.io.BufferedReader;
import java.io.IOException;
import java.io.InputStreamReader;

public class UserInput {
    // Method to get an array input from the user
    public static double[] inputArray(int size) throws IOException {
        // Create a BufferedReader to read user input
        BufferedReader br = new BufferedReader(new InputStreamReader(System.in));

        // Prompt the user to enter the array elements
        System.out.println("Enter the array elements separated by spaces: ");

        // Read the array input as a string
        String array = br.readLine();

        // Initialize an array to store the input elements
        double[] arrayInput = new double[size];
```

```

// Split the input string and convert each element to double
String[] input = array.trim().split("\\s+");

// Populate the array with the converted elements
for (int i = 0; i < size; i++) {
    arrayInput[i] = Double.parseDouble(input[i]);
}

// Return the array containing user-input elements
return arrayInput;
}
}

import java.io.IOException;
import java.util.Arrays;
import java.util.Scanner;

public class OddEven {
    public static void main(String[] args) throws IOException {
        // Create a Scanner object to read user input
        Scanner sc = new Scanner(System.in);

        // Declare arrays for even and odd numbers
        double[] even;
        int j = 0;
        int k = 0;
        double[] odd;

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

        // Read the size from user input

```

```

int size = sc.nextInt();

// Initialize arrays for even and odd numbers based on the user-defined size
even = new double[size];
odd = new double[size];

// Get the array input from the user using the UserInput class
double[] array = UserInput.inputArray(size);

// Close the Scanner to avoid resource leaks
sc.close();

// Separate even and odd numbers into their respective arrays
for (int i = 0; i < size; i++) {
    if (array[i] % 2 == 0) {
        even[j] = array[i];
        j++;
    } else {
        odd[k] = array[i];
        k++;
    }
}

System.out.println("Even numbers:");
System.out.print(Arrays.toString(even));
System.out.println("Odd numbers:");
System.out.print(Arrays.toString(odd));
}

// Method to print elements of an array
public static void print(double[] array, int size) {
    for (int i = 0; i < size; i++) {
        System.out.println(array[i]);
    }
}

```

```
}
```

Output:

```
Enter the number of elements to enter:
6
Enter the array elements separated by spaces:
5 9 3 4 8 8
Even elements:
[4.0, 8.0, 8.0, 0.0, 0.0, 0.0]
Odd elements:
[5.0, 9.0, 3.0, 0.0, 0.0, 0.0]
```

Q2 Implement a Java function that finds two neighbouring numbers in an array with the smallest distance to each. The function should return the index of the 1st number.

Code:

```
// Neighbours.java
```

```
//Sahil Goyal
```

```
//AIML-B1
```

```
//2022-26
```

```
//22070126094
```

```
package Assignment_2;
```

```
import java.io.IOException;
```

```
import java.util.Scanner;
```

```
public class Neighbours {
```

```
    public static void main(String[] args) throws IOException {
```

```
        // Create a Scanner object to read user input
```

```
        Scanner sc = new Scanner(System.in);
```

```
        // Prompt the user to enter the size of the array
```

```
        System.out.println("Enter the size of the array: ");
```

```
        // Read the size of the array from user input
```

```
        int size = sc.nextInt();
```

```

// Get the array input from the user using the UserInput class
double[] array = UserInput.inputArray(size);
sc.close();

// Find and print the index of the nearest neighbours in the array
System.out.println("Index of Nearest Neighbours: " + findNearestNeighbours(array));
}

// Method to find the index of nearest neighbours in the array
public static int findNearestNeighbours(double[] arr) {
    double minDistance = Double.MAX_VALUE;
    int index = -1;

    // Iterate through the array and calculate distances between adjacent elements
    for (int i = 0; i < arr.length - 1; i++) {
        double distance = Math.abs(arr[i] - arr[i + 1]);

        // Update the index if the current distance is smaller than the minimum distance
        if (distance < minDistance) {
            minDistance = distance;
            index = i;
        }
    }

    // Return the index of the nearest neighbours
    return index;
}
}

```

Output:

```
Enter the size of the array:
8
Enter the array elements separated by spaces:
4 8 14 77 90 105 104 55
Index of Nearest Neighbours: 5
```

Q3 Write a Java program to convert an array into ArrayList and vice versa.

Code:

```
// ArrayAndArrayList.java
```

```
//Sahil Goyal
```

```
//AIML-B1
```

```
//2022-26
```

```
//22070126094
```

```
package Assignment_2;
```

```
import java.io.IOException;
```

```
import java.util.*;
```

```
public class ArrayAndArrayList {
```

```
    public static void main(String[] args) throws IOException {
```

```
        // Create a Scanner object to read user input
```

```
        Scanner sc = new Scanner(System.in);
```

```
        // Prompt the user to enter the size of the array
```

```
        System.out.println("Enter the size of array: ");
```

```
        // Read the size from user input
```

```
        int size = sc.nextInt();
```

```
        // Get the primitive double array from user input using UserInput class
```

```
        double[] array = UserInput.inputArray(size);
```

```
        // Close the Scanner to avoid resource leaks
```

```
        sc.close();
```

```

// Print the primitive double array using Arrays.toString
System.out.println(Arrays.toString(array));

// Convert the primitive double array to an ArrayList<Double>
System.out.println("Primitive array to ArrayList: ");
List<Double> arrlist = Arrays.asList(Arrays.stream(array).boxed().toArray(Double[]::new));

// Print the elements of the ArrayList using a for-each loop
for (Double element : arrlist) {
    System.out.println(element);
}

// Convert ArrayList to array
System.out.println("ArrayList to array: ");
double[] arr = arrlist.stream().mapToDouble(Double::doubleValue).toArray();
System.out.println(Arrays.toString(arr));
}
}

```

Output:

```

Enter the size of array:
6
Enter the array elements separated by spaces:
12 56 34 47 11 95
[12.0, 56.0, 34.0, 47.0, 11.0, 95.0]
Primitive array to ArrayList:
12.0
56.0
34.0
47.0
11.0
95.0
ArrayList to array:
[12.0, 56.0, 34.0, 47.0, 11.0, 95.0]

```

Check my repo for all the assignments organized:

https://github.com/sahilgoyal7214/programming-in-java/tree/main/Assignment_2