LAB 8

Generics in Java

Objective : Implementing generic classes and methods for ensuring compile time type safety of data.

Task #1: Write a program that takes integer array, double array and float array. Make a generic function that performs subtraction on array element:

```java
package lab;
public class Main {
    public static <T extends Number> void calculateDifference(T[] inputArray) {
        System.out.print("Output: [");

        for (int i = 0; i < inputArray.length - 1; i++) {
            double diff = inputArray[i+1].doubleValue() - inputArray[i].doubleValue();
            if (diff == (long) diff) {
                System.out.print((long) diff);
            } else {
                System.out.printf("%.2f", diff);
            }
            if (i < inputArray.length - 2) {
                System.out.print(", ");
            }
        }
        System.out.println("]");
    }
    public static <T> void printInput(T[] inputArray) {
        System.out.print("Input: [");
        for (int i = 0; i < inputArray.length; i++) {
            System.out.print(inputArray[i]);
            if (i < inputArray.length - 1) System.out.print(", ");
        }
        System.out.println("]");
    }
    public static void main(String[] args) {
        Integer[] intArray = {5, 7, 3, 9, 19};
        printInput(intArray);
        calculateDifference(intArray);
        System.out.println();
        Double[] doubleArray = {10.5, 12.5, 8.0, 20.5};
        printInput(doubleArray);
        calculateDifference(doubleArray);
        System.out.println();
        Float[] floatArray = {2.2f, 4.4f, 1.1f, 5.5f};
        printInput(floatArray);
        calculateDifference(floatArray);
    }
}
```

```
<terminated> Main [Java Application] C:\Users\Abdullah\
Input: [5, 7, 3, 9, 19]
Output: [2, -4, 6, 10]

Input: [10.5, 12.5, 8.0, 20.5]
Output: [2, -4.50, 12.50]

Input: [2.2, 4.4, 1.1, 5.5]
Output: [2.20, -3.30, 4.40]
```