Java-2022. ДЗ №1

26 Dec 2022, 00:49:38
start: 9 Oct 2022, 16:32:37
finish: 23 Oct 2022, 16:32:37
duration: 14d.
start: 23 Sep 2022, 10:55:00

A. Maximal sum

	All compilers	Oracle Java 7	Oracle Java 8
Time limit	0.1 seconds	1 second	1 second
Memory limit	10Mb	256Mb	256Mb
Input	standard input or input.txt		
Output	standard output or output.txt		

Given two arrays of integers with the same length, $A\ [0..n-1]$ and $B\ [0..n-1]$. It is necessary to find the first pair of indices i_0 and j_0, $i_0 \le j_0$, such that $A[i_0] + B[j_0] = \max\{A[i] + B[j]$, where $0 \le i < n$, $0 \le j < n$, $i \le j\}$.

Sample

Input	Output
4 4 -8 6 0 -10 3 1 1	0 1

Language: Oracle Java 8

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```java
import java.util.Scanner;

public class Main {
    public static void main(String[] args) {
        int array_size;
        Scanner scan = new Scanner(System.in);
        array_size = scan.nextInt();
        int[] first_array = new int[array_size];
        for (int i = 0; i < array_size; i++) {
            first_array[i] = scan.nextInt();
        }
        int[] second_array = new int[array_size];
        for (int i = 0; i < array_size; i++) {
            second_array[i] = scan.nextInt();
        }

        int max = Integer.MIN_VALUE;
        int[] max_position_1 = new int[array_size];
        int current_max = 0;
        for (int i = 0; i < array_size; i++) {
            if (first_array[i] > max) {
                max = first_array[i];
                current_max = i;
            }
            max_position_1[i] = current_max;
        }
        int first_pos = 0;
        int second_pos = 0;
        for (int i = 0; i < array_size; i++) {
            current_max = second_array[i] + first_array[max_position_1[i]];
            if (current_max > max) {
                max = current_max;
                first_pos = max_position_1[i];
                second_pos = i;
            }
        }
        System.out.print(first_pos + " " + second_pos);
    }
```

Submit

B. Area of N-gon

	All compilers	Oracle Java 7	Oracle Java 8
Time limit	0.005 seconds	0.1 seconds	0.1 seconds
Memory limit	500Kb	256Mb	256Mb
Input	standard input or input.txt		
Output	standard output or output.txt		

Calculate the area of a convex n-gon given by the coordinates of its vertices. First, the number of vertices is entered, then the integer coordinates of all the vertices are sequentially entered in a clockwise order.
$n < 1000$, coordinates < 10000.

Note. To calculate the area of the n-gon, one can calculate the sum of the oriented areas of the trapezium under each side of the polygon.

Sample

Input	Output
3 1 0 0 1 2 2	1.5

Language Oracle Java 8

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```
1
```

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C. Required sum

Compiler	Time limit	Memory limit	Input	Output
All compilers	0.1 seconds	2Mb	standard input or input.txt	standard output or output.txt
Oracle Java 7	1 second	256Mb		
Python 3.7.3	0.5 seconds	18Mb		
python3.6+numpy+pandas	0.5 seconds	256Mb		
Python 2.7	0.5 seconds	18Mb		
Python 3.6	0.5 seconds	18Mb		
Oracle Java 8	1 second	256Mb		

Two strictly increasing arrays of integers $A\ [0..n)$ and $B\ [0..m)$ and the number k are given. Find the number of such pairs of indices (i, j) such that $A\ [i] + B\ [j] = k$. $O\ (n + m)$ operation time is required. $n, m \leq 100{,}000$.
Note. Traverse array B from end to top.

Sample

Input	Output
4 -5 0 3 18 5 -10 -2 4 7 12 7	3

Language Oracle Java 8

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```
1
```

Submit

D. Counting

Compiler	Time limit	Memory limit	Input	Output
All compilers	0.15 seconds	20Mb	standard input or input.txt	standard output or output.txt
Oracle Java 7	1 second	20Mb		
Python 3.7.3	0.5 seconds	64Mb		
Python 2.7	0.5 seconds	20Mb		
Python 3.6	0.5 seconds	20Mb		
Oracle Java 8	1 second	20Mb		

N people are lined up in a circle, numbered from 1 to N. We will exclude each kth until only one person survives.
For example, if N = 10, k = 3, then first the 3rd, then the 6th, then the 9th, then the 2nd, then the 7th, then the 1st, then the 8th, then - 5th, and then 10th. Thus, the 4th survives.

It is necessary to determine the number of the survivor.

$N, k \leq 10,000.$

Sample

Input	Output
10 3	4

Language Oracle Java 8

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1

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