
Training for the World Finals

P51803_en

Setzè Concurs de Programació de la UPC - Semifinal (2018-06-20)

The UPC team *12 seconds* could barely train for the World Finals. For instance, sometimes only Ferran and Ángel could join for a training. In those cases, a possible strategy was to make Ferran think about how to solve the problems, and to make Ángel program the solutions previously found and written down on paper by Ferran.

Suppose that a training had n problems. Let t_i be the time that Ferran needed to solve the i -th problem, and p_i be the time that Ángel needed to program the i -th problem. Both Ferran and Ángel could only perform one task at a time, but could decide the order of thinking and the order of programming, with just one restriction: Ferran had to completely solve a problem before Ángel could start programming its solution.

Given all this information, can you please minimize the total time to solve and program all the problems?

Input

Input consists of several cases, each one with n followed by t_1, \dots, t_n , followed by p_1, \dots, p_n . Assume $1 \leq n \leq 10^5$, and that all t_i and p_i are between 1 and 10^9 .

Output

For every case, print the minimum time to solve and program all the problems.

Sample input

```
2
80 90
100 100

4
4 4 4 4
1 2 4 6

5
5 1 2 3 6
3 1 3 5 5

3
1000000000 1000000000 1000000000
1000000000 1000000000 1000000000
```

Sample output

```
280
17
20
4000000000
```

Problem information

Author : Ferran Alet and Ángel García
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