Problem A. Optimal Display Rental

Time limit 1000 ms
Mem limit 262144 kB

It is the middle of 2018 and Maria Stepanovna, who lives outside Krasnokamensk (a town in Zabaikalsky region), wants to rent three displays to highlight an important problem.

There are n displays placed along a road, and the i-th of them can display a text with font size s_i only. Maria Stepanovna wants to rent such three displays with indices $i < j < k$ that the font size increases if you move along the road in a particular direction. Namely, the condition $s_i < s_j < s_k$ should be held.

The rent cost is for the i-th display is c_i. Please determine the smallest cost Maria Stepanovna should pay.

Input

The first line contains a single integer n ($3 \le n \le 3\,000$) — the number of displays.

The second line contains n integers $s_1, s_2, \ldots, s_n$ ($1 \le s_i \le 10^9$) — the font sizes on the displays in the order they stand along the road.

The third line contains n integers $c_1, c_2, \ldots, c_n$ ($1 \le c_i \le 10^8$) — the rent costs for each display.

Output

If there are no three displays that satisfy the criteria, print `-1`. Otherwise print a single integer — the minimum total rent cost of three displays with indices $i < j < k$ such that $s_i < s_j < s_k$.

Examples

Input	Output
5 2 4 5 4 10 40 30 20 10 40	90

Input	Output
3 100 101 100 2 4 5	-1

Input	Output
10 1 2 3 4 5 6 7 8 9 10 10 13 11 14 15 12 13 13 18 13	33

Note

In the first example you can, for example, choose displays 1, 4 and 5, because $s_1 < s_4 < s_5$ ($2 < 4 < 10$), and the rent cost is $40 + 10 + 40 = 90$.

In the second example you can't select a valid triple of indices, so the answer is -1.