Educational DP Contest AtCoder Q - Flowers

Time limit: 1.4s **Memory limit:** 1G

There are N flowers arranged in a row. For each i $(1 \leq i \leq N)$, the height and the beauty of the i-th flower from the left is h_i and a_i, respectively. Here, $h_1, h_2, \ldots, h_N$ are all distinct.

Taro is pulling out some flowers so that the following condition is met:

- The heights of the remaining flowers are monotonically increasing from left to right.

Find the maximum possible sum of the beauties of the remaining flowers.

Constraints

- All values in input are integers.
- $1 \leq N \leq 2 \times 10^5$
- $1 \leq h_i \leq N$
- $h_1, h_2, \ldots, h_N$ are all distinct.
- $1 \leq a_i \leq 10^9$

Input Specification

The first line will contain the integer N.

The next line will contain N integers, h_i.

The next line will contain N integers, a_i.

Output Specification

Print the maximum possible sum of the beauties of the remaining flowers.

Sample Input 1

```
4
3 1 4 2
10 20 30 40
```

Sample Output 1

```
60
```

Explanation For Sample 1

We should keep the second and fourth flowers from the left. Then, the heights would be $1, 2$ from left to right, which is monotonically increasing, and the sum of the beauties would be $20 + 40 = 60$.

Sample Input 2

```
1
1
10
```

Sample Output 2

```
10
```

Explanation For Sample 2

The condition is met already at the beginning.

Sample Input 3

```
5
1 2 3 4 5
1000000000 1000000000 1000000000 1000000000 1000000000
```

Sample Output 3

```
5000000000
```

Explanation For Sample 3

The answer may not fit into a 32-bit integer type.

Sample Input 4

```
9
4 2 5 8 3 6 1 7 9
6 8 8 4 6 3 5 7 5
```

Sample Output 4

```
31
```

Explanation For Sample 4

We should keep the second, third, sixth, eighth and ninth flowers from the left.