Candy Collection

Halloween is here! Mancunian runs a candy shop and his friend Liverbird is here to buy candies to give to the children. There are n *boxes* of candies in a line. The i^{th} box contains V_i candies, and the i^{th} box has color T_i. Liverbird wants to buy all the boxes! But the problem is that he does not have a lot of money. :(

Liverbird will carry all the boxes home using crates. A *crate* will contain a contiguous sequence of candy boxes. (*Note:* Don't confuse boxes with crates; crates will contain boxes and boxes contain candies.) Each box belongs to exactly one crate. Liverbird is also choosy about the boxes in a single crate. He does not want any two boxes in the same crate to have the same color. The cost of a crate is the bitwise OR of the number of candies in the boxes it contains (don't ask Mancunian why). For example, the cost of a crate containing three boxes, containing 1, 2 and 3 candies respectively, is 1 OR 2 OR 3 = 3.

What is the minimum total cost needed to buy all the boxes?

Input Format

The first line of input contains n, the number of candy boxes.
The second line contains n space-separated integers, the i^{th} of which represents T_i, the color of the i^{th} box. Colors are represented as positive integers.
The third line contains n space-separated integers, the i^{th} of which represents the number of candies V_i in the i^{th} box.

Constraints

- $1 \leq n \leq 500000$
- $1 \leq T_i \leq 10^6$
- $0 \leq V_i \leq 10^6$

Subtask

- For 30% of the maximum points, $1 \leq n \leq 5000$

Output Format

Print a single integer which is the answer to the given problem.

Sample Input 0

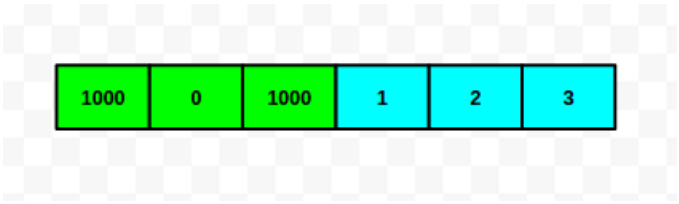
```
6
5 2 1 3 4 2
1000 0 1000 1 2 3
```

Sample Output 0

```
1003
```

Explanation 0

Liverbird will use two crates.
The first green crate contains the first three boxes and has cost 1000 OR 0 OR 1000 = 1000.
The second blue crate contains the last three boxes and has cost 1 OR 2 OR 3 = 3.



Sample Input 1

```
5
1 2 3 4 1
9 9 9 2 2
```

Sample Output 1

```
11
```

Explanation 1

Liverbird will use two crates.
The first green crate contains the first, second and third boxes and has cost 9 OR 9 OR 9 = 9.
The second blue crate contains the fourth and the fifth boxes and has cost 2 OR 2 = 2.