



# Problem G

## Same Color

Time Limit: 0.5 Seconds

There are  $n$  distinct points with  $m$  colors on the line, where  $m \leq n$ . Let  $S$  be the set of those points. We want to select a non-empty subset  $C \subseteq S$  that satisfies the following:

For every point  $p$  in  $S - C$ , not belonging to  $C$ , the closest point of  $p$  among points in  $C$  has the same color as  $p$ . Of course, if there are more than one closest point of  $p$  in  $C$ , then it is sufficient that one of them has the same color as  $p$ .

For example, there are six points labeled by 1 to 6 with two colors in Figure G.1. Points 4 and 5 are red and the others blue. The set  $\{2, 4, 6\}$  satisfies the above property. But the set  $\{2, 4\}$  does not satisfy the property, because the closest point of point 6 in  $\{2, 4\}$  is point 4, which is different from the color of point 6. In fact, the set  $\{2, 4, 6\}$  is a minimum cardinality subset to satisfy the property.

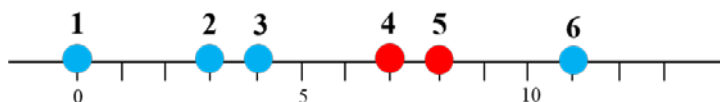


Figure G.1: Six colored points on a line

Given  $n$  distinct points on the line and  $m$  their colors, write a program to find a non-empty subset  $C$  of  $S$  with minimum cardinality satisfying the above property and to output the minimum cardinality.

### Input

Your program is to read from standard input. The input starts with a line containing two integers,  $m$  and  $n$  ( $1 \leq m \leq n \leq 100,000$ ), where  $m$  is the number of colors and  $n$  is the number of points. The points are numbered 1 to  $n$  from left to right on the line, and the colors are numbered 1 to  $m$ . The second line contains a sequence of sorted  $n$  integers in increasing manner, where the  $i$ -th number is the coordinate of the point  $i$ . The coordinates  $x$  of points satisfy  $0 \leq x \leq 10^9$  and are all distinct. The third line contains a sequence of  $n$  integers, where the  $i$ -th number is the color of the point  $i$ , which is between 1 and  $m$ .

### Output

Your program is to write to standard output. Print exactly one line. The line should contain the minimum cardinality of a non-empty subset  $C$  of  $S$  to satisfy the above property.

The following shows sample input and output for two test cases.

Sample Input 1	Output for the Sample Input 1
2 6 0 3 4 7 8 11 1 1 1 2 2 1	3

Sample Input 2	Output for the Sample Input 2
2 6 0 3 4 7 8 11 1 2 1 2 2 1	5