

Problem J4/S1: Trianglane

Problem Description

Bocchi the Builder just finished constructing her latest project: a laneway consisting of two rows of white equilateral triangular tiles. However, at the last moment, disaster struck! She accidentally spilled black paint on some of the tiles. Now, some of the tiles are wet and the other tiles are dry. Bocchi must place warning tape around the perimeters of all wet areas. Can you help her determine how many metres of tape she needs?

The first triangular tile will point upwards. Each pair of adjacent tiles (that is, tiles that share a common side) will point in opposite directions. Each tile has a side length of 1 metre.

Input Specification

The first line of input will consist of one positive integer C , representing the number of columns.

The next two lines will each consist of C integers separated by spaces. Each integer represents the colour of a tile along the laneway, with 1 indicating that the tile is black (wet) and 0 indicating that the tile is white (dry).

The following table shows how the available 15 marks are distributed:

| Marks | Description | Bound |
|-------|---|-------------------|
| 3 | The laneway is not very long, black tiles are never adjacent and the second row is fully white. | $C \leq 2\,000$ |
| 3 | The laneway is not very long, black tiles may be adjacent and the second row is fully white. | $C \leq 2\,000$ |
| 5 | The laneway is not very long, black tiles may be adjacent and may appear in the second row. | $C \leq 2\,000$ |
| 4 | The laneway may be very long, black tiles may be adjacent and may appear in the second row. | $C \leq 200\,000$ |

Output Specification

Output a single integer representing the length of tape Bocchi needs, in metres.

Sample Input 1

```
5
1 0 1 0 1
0 0 0 0 0
```

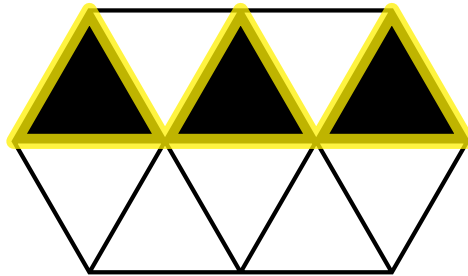
Output for Sample Input 1

```
9
```

La version française figure à la suite de la version anglaise.

Explanation of Output for Sample Input 1

The tiles are painted as follows, creating three wet areas. Bocchi will need 9 metres of warning tape as shown in yellow.



Sample Input 2

7

0 0 1 1 0 1 0

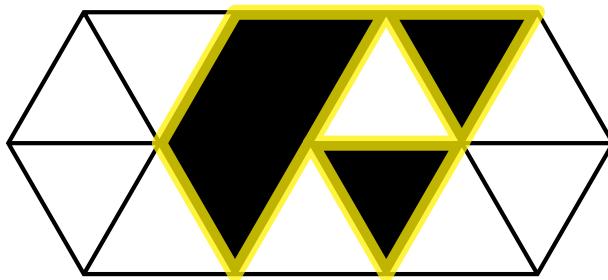
0 0 1 0 1 0 0

Output for Sample Input 2

11

Explanation of Output for Sample Input 2

The tiles are painted as follows, creating three wet areas. Bocchi will need 5 metres of warning tape to surround one area and 3 metres of warning tape to surround each of the other two areas as shown in yellow.



La version française figure à la suite de la version anglaise.