Byteck has paid a visit to a casino, where he immediately got interested in a slot machine. The most important part of the machine are three reels. Each of them is divided into n equal fields. There are various symbols painted in those fields. There are N possible symbols, and each of them is present exactly once, on each of the reels. For simplicity, we will number the symbols from 1 to n. The following figure shows an example of slot machine with three reels divided into $n = 5$ fields:

After pulling the lever, each of the reels moves cyclically by a certain number of positions. The amount that can be won by a player depends on the number of horizontal rows containing three identical symbols.

Byteck knows that the slot machine can take over all his money, so he would first prefer to find out what could be his maximum payout. Help him and determine the number of rows, where three identical symbols could be found in case the drums are positioned in most favourable way.

Input

The first line of input contains one integer n indicating the size of the drums. The next three lines describe symbols arrangement on the individual drums.

Description of the drum consists of n pairwise distinct integers $a_1, a_2, \ldots, a_n$ ($1 \le a_i \le n$), where a_i describes the symbol on i-th position.

Output

The first and only line of output should contain one integer, equal to the maximum number of rows, where three identical symbols each could be found at one time.

Example

For the input data:

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

the correct result is:

```
3
```

Example explanation: the figure referring to the exemplary test is located inside the text of the exercise. We can turn drum 1 by three positions up, drum 2 by one position up, and drum 3 by one position down.

Grading

Subtask	Conditions	Points
1	$n \le 100$	25
2	$n \le 5000$	25
3	$n \le 300\,000$	50