Bingo

In the new Riyadh season, Ali decided to participate in the Saudi Bingo Competition! He was given an $N \times N$ bingo card. Each cell in the grid $G_{i,j}$ contains a distinct number between 0 and 10^9. Then, K numbers are called one by one.

Whenever a number is called, Ali checks his card. **If the number is present**, he marks the corresponding cell Ali wins the game (gets Bingo) the moment any of the following becomes fully marked:

- An entire **row**.
- An entire **column**.
- The **main diagonal** (from top-left to bottom-right).
- The **anti-diagonal** (from top-right to bottom-left).

You are given the entire card and the sequence of called numbers. Your task is to determine after how many numbers Ali gets Bingo. It is guaranteed that Ali will always get Bingo eventually.

Implementation details

For C++:

```
int bingo_turn(int N, int K, std::vector<std::vector<int>> grid,
    std::vector<int> called_numbers);
```

For Python:

```
def bingo_turn(N: int, K: int, grid: list[list[int]],
    called_numbers: list[int]) -> int
```

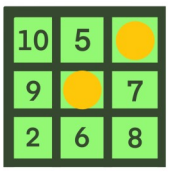
- `N`: the size of the square Bingo grid.
- `K`: the number of called numbers.
- `grid`: a 2D array G of dimensions $N \times N$, representing Ali's Bingo card. Each cell contains a distinct number.
- `called_numbers`: a list of K integers. These are the numbers called in order. Not all called numbers are guaranteed to appear in the grid.
- This function should return a single integer: The **1-based index** of the number in called_numbers that causes Ali to get Bingo for the first time.

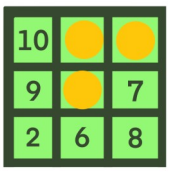
Examples

Example 1

```
N = 3
K = 2
grid = {{10, 5, 0} , {9, 3, 7} , {2, 6, 8}}
called_numbers = {0, 3, 5, 10}
```

The answer is 4.





Constraints

- $1 \leq N \leq 1000$
- $1 \leq K \leq N \times N$
- $1 \leq G_{i,j} \leq N \times N$
- All integers in G are distinct
- Ali is always guaranteed to win
- All the K calls are distinct

Subtasks

1. $N = 3, K < 9$ (20 points)
2. $N, K \leq 300$ (30 points)
3. The grid is sorted in row-major order, i.e.,

   $1\ 2\ 3$

   $4\ 5\ 6$

   $7\ 8\ 9$

   (25 points).
4. No additional constraints (25 points).

Sample grader

line 1: N

lines 2 to $N+1$: the i-th row of the grid

line $N+2$: K

lines $N+3$ to $N+K+2$: the i-th number called