

8 Topswops

Maddison and Gata are reading extra material on permutations for their Discrete Mathematics course. They came across an interesting card game from the 1970s, called topswops. They want to understand it better, so they want to be able to run simulations of the game for many different situations.

Topswops is played with a deck of cards numbered sequentially from 1 to N . The cards are randomly shuffled. Then, the top card's number is examined, let's call it M . The top M cards are removed from the deck and placed in reverse order, then added to the top of the deck. The game repeats until the card numbered 1 reaches the top of the deck.

For example, in a 5 card game, the shuffle may produce a deck with cards ordered 3 4 2 5 1. A single turn would extract the top 3 cards and reverse their order, putting them back on top to produce the deck 2 4 3 5 1.

Help Maddison and Gata with this problem by creating a program to count the number of turns for a topswops game to complete given the initial order of the deck.

The first line of input will contain the number of cards in the deck $1 \leq N \leq 20$. The second line of input will contain the number of decks to solve $1 \leq P \leq 1000$. The following P lines will contain N numbers separated by spaces. Each of these is the shuffled order of the deck.

The output will contain P lines with one number per line. This is the number of turns until the 1 card moves to the top of the deck.

Note: The \leftarrow symbol in the examples below represents a newline character.

Sample Input

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

Sample Output

```
4←  
6←  
0←  
1←
```