

Lab Assignment 2 CS109 2024Spring

Problem 1. Does Qi win? (30 pts)

Qi participates in a knowledge competition. He and his competitor come to the final round. The game consists of several questions. Qi and his competitor need to complete all the questions individually. The one with higher total score wins after all questions are answered.

The rules for counting scores are shown below:

- The score of each question may be different.
- If the answer is **correct**, the points for that question are added to the player's total score.
- If the answer is **wrong**, the points for that question are subtracted from the player's total score.
- If the question is **not answered** by the player, half of the points for that question are subtracted from the player's total score.

Please judge whether Qi wins the final round.

Input Format

The input contains 4 lines of string.

The first line is the number of questions n ($1 \leq n \leq 50$).

The second line is the score information for each question. Each score is an integer, separated by a space.

The third line is the record of answering information for Qi, which is separated by a space.

The forth line is the record of answering information for the competitor, which is also separated by a space.

There are 3 types for **answering information**, which are `2`, `1`, `0`. They means **answer correctly**, **answer wrongly** and **not answer** respectively.

Output Format

If Qi's final score is higher than the competitor's final score, please output `Qi won`.

If Qi's final score is lower than the competitor's final score, please output `Qi lost`.

If Qi's final score is as same as the competitor's final score, please output `Qi need another round`.

Please note that the output does **NOT** contain any punctuation marks.

Samples

Sample 1

Input

```
3
10 5 3
2 1 0
1 0 2
```

Output

```
Qi won
```

Explanation

Qi earns 10 points, $5 + 1.5 = 6.5$ points are subtracted. Thus, the total score for Qi is $10 - 6.5 = 3.5$ points.

The competitor earns 3 points, $10 + 2.5 = 12.5$ points are subtracted. Thus, the total score for the competitor is $3 - 12.5 = -9.5$ points.

Qi's final score is higher than the competitor and `Qi won`.

Sample 2

Input

```
3
10 10 10
2 2 2
0 0 0
```

Output

```
Qi won
```

Sample 3

Input

```
3
10 10 10
0 0 0
2 2 2
```

Output

```
Qi lost
```

Sample 4

Input

```
3
10 10 10
0 0 0
0 0 0
```

Output

```
Qi need another round
```

Hint

Please compare your output with standard output shown above carefully, like letter case forms and spaces.

Problem 2. Watch movie together (30 pts)

Qi and two friends want to watch movies together. They make a list of movies they'd like to watch. Please check them out and see if they have any movies in common that they'd like to watch.

Input Format

The input contains 6 lines, which are movie lists of Qi and two friends.

There are 2 lines for each movie list:

- The first line shows the number of movie number n ($1 \leq n \leq 100$) in the list.
- The second line contains n integers. Each integer represents a movie number num ($1 \leq num \leq 1000$). The movie indexes are separated by a space.

Output Format

Please output the amount of films that Qi and two friends would like to watch together.

Samples

Sample 1

Input

```
5
1 2 3 4 5
6
2 3 4 5 6 7
3
16 5 9
```

output

```
1
```

Explanation to input

The first line indicates that the list of films that the first person wants to watch has 5 films.

The second line indicates that the list of films that the first person wants to watch contains films numbered 1, 2, 3, 4, 5.

The third and fourth lines indicate that the second person wants to watch 6 films in the list, which are numbered 2, 3, 4, 5, 6, 7.

The fifth and sixth lines indicate that the third person wants to watch 3 films in the list, which are numbered 16, 5, 9.

Explanation to output

The serial number included in the list of films for all 3 people is only NO. 5, so the output is 1, which indicates that the number of films the three people want to watch together is 1.

Sample 2

Input

```
5
1 2 3 4 5
6
2 3 4 5 6 7
3
16 23 9
```

output

```
0
```

Explanation

There is no common film number in the list of films for 3 people, so the output is 0.

Problem 3. School Anniversary Balloon (40 pts)

The school anniversary is coming. Qi and the classmates are decorating the school playground with several balloons.

Qi and the classmates have divided the playground into a number of area blocks according to certain rules in advance. The blocks can be represented as in **Figure 1**, and each block has a specific coordinate value to pinpoint its location.

	0	1	2	3	4
0	(0, 0)	(0, 1)	(0, 2)	(0, 3)	(0, 4)
1	(1, 0)	(1, 1)	(1, 2)	(1, 3)	(1, 4)
2	(2, 0)	(2, 1)	(2, 2)	(2, 3)	(2, 4)
3	(3, 0)	(3, 1)	(3, 2)	(3, 3)	(3, 4)
4	(4, 0)	(4, 1)	(4, 2)	(4, 3)	(4, 4)
5	(5, 0)	(5, 1)	(5, 2)	(5, 3)	(5, 4)

Figure 1

In each area block, you can place balloons, lanterns, or nothing at all.

If a block has been decorated with lanterns, we use the number 1 to indicate it. If a block has not placed any item, we denote it by the number 0. For example, in **Figure 2**, locations (0, 0), (2, 3), (3, 0), (5, 0), (5, 2), (5, 4) are already decorated with lanterns, which is represented by the number 1. No other items have been placed at the other positions, they are represented by the number 0.

	0	1	2	3	4
0	1 (0, 0)	0 (0, 1)	0 (0, 2)	0 (0, 3)	0 (0, 4)
1	0 (1, 0)	0 (1, 1)	0 (1, 2)	0 (1, 3)	0 (1, 4)
2	0 (2, 0)	0 (2, 1)	0 (2, 2)	1 (2, 3)	0 (2, 4)
3	1 (3, 0)	0 (3, 1)	0 (3, 2)	0 (3, 3)	0 (3, 4)
4	0 (4, 0)	0 (4, 1)	0 (4, 2)	0 (4, 3)	0 (4, 4)
5	1 (5, 0)	0 (5, 1)	1 (5, 2)	0 (5, 3)	1 (5, 4)

Figure 2

Qi and the classmates are asked to place balloons to complete the subsequent decorations on the playground where the lanterns had already been placed. The following rules need to be satisfied when placing balloons:

- No balloons can be placed where the lanterns are placed;
- No balloons can be placed **adjacent** to where the lanterns are to be placed;
- No balloons can be placed where the balloons are placed;
- No balloons can be placed **adjacent** to where the balloons have been placed;
- For the **adjacent** positions of lanterns and balloons, **only the upper and lower 2 positions can be considered**; the left, right, upper-left, lower-left, upper-right, lower-right positions are **NOT** counted as adjacent positions.

Based on **Figure 2**, all adjacent positions where lanterns have been placed have been marked, which is shown on **Figure 3** with the blue background. That is to say, all positions marked with the blue background are not allowed to place balloons.

	0	1	2	3	4
0	1 (0, 0)	0 (0, 1)	0 (0, 2)	0 (0, 3)	0 (0, 4)
1	0 (1, 0)	0 (1, 1)	0 (1, 2)	0 (1, 3)	0 (1, 4)
2	0 (2, 0)	0 (2, 1)	0 (2, 2)	1 (2, 3)	0 (2, 4)
3	1 (3, 0)	0 (3, 1)	0 (3, 2)	0 (3, 3)	0 (3, 4)
4	0 (4, 0)	0 (4, 1)	0 (4, 2)	0 (4, 3)	0 (4, 4)
5	1 (5, 0)	0 (5, 1)	1 (5, 2)	0 (5, 3)	1 (5, 4)

Figure 3

Suppose Qi has num balloons to place, help Qi to see if they can place all of them according to the rules above.

Input Format

The input contains several lines.

The first line is an integer num ($1 \leq num \leq 2^{10}$), which represents the total number of balloons Qi need to place.

The second line is two integer m and n ($1 \leq m, n \leq 100$), which represents the size of the playground. m indicates how many rows and n indicates how many columns.

Next there are m rows of input data, each consisting of n integers representing the placement situation of each block, with 1 indicating that a lantern has been placed and 0 indicating that no items have been placed. Each integer is separated by a space.

Output Format

For each test case, if Qi successfully place all of num balloons, then output `True`. If not, output `False`.

Samples

Sample 1

Input

```
2
6 5
1 0 0 0 0
0 0 0 0 0
0 0 0 1 0
1 0 0 0 0
0 0 0 0 0
1 0 1 0 1
```

output

True

Sample 2

Input

```
20
6 5
1 0 0 0 0
0 0 0 0 0
0 0 0 1 0
1 0 0 0 0
0 0 0 0 0
1 0 1 0 1
```

output

False

Hint

For the output, please make sure that the case form of each letter must be kept consistent with the document.

Please note that after the first balloon has been placed, no more balloons can be placed in its **adjacent** positions.