Mega Tic-Tac-Toe

locked

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Alexis is bored with regular Tic-Tac-Toe, played on a 3×3 board. She decides to invent *Mega Tic-Tac-Toe*, which has the following additional rules:

- The board is of size $n \times m$.
- Alexis is always the letter `O`, and the other player is always the letter `X`.
- To win a game, there should be at least k consecutive cells containing the same symbol (i.e., either an `X` or an `O`). Each group of k consecutive cells must be in the horizontal, vertical, or diagonal direction (i.e., you cannot mix and match a cluster of adjacent cells).

As the size of the board increases, it becomes more and more difficult to determine who wins each game of Mega Tic-Tac-Toe. Given the value of k and the layout of the board for g games of Mega Tic-Tac-Toe, print the winner of each game on a new line. If Alexis wins, print `WIN`; if she loses, print `LOSE`. If neither player wins, print `NONE`.

Note If both players have at least k consecutive cells, neither player wins.

Input Format

The first line contains an integer, g, denoting the number of games played. The subsequent lines describe each game as follows:

1. The first line contains three space-separated integers describing the respective values of n, m, and k for that game of Mega Tic-Tac-Toe.
2. Each of the n subsequent lines contains a string of m characters. Each character will be one of the following: an `O` (denoting a cell marked by Alexis), an `X` (denoting a cell marked by her opponent), or a `-` (denoting an unmarked cell).

Constraints

- $1 \leq g \leq 4$
- $1 \leq n, m \leq 1000$
- $1 \leq k \leq 1000$
- There may not be a winner for every game.

Output Format

For each game board, print the `WIN`, `LOSE`, `NONE` according to the statement.

Sample Input

```
4
3 3 3
XOX
XOX
XXX
3 3 3
X-X
O-O
X-X
3 3 3
O-X
XOO
XOO
```

```
3 3 3
O-X
O-X
O-X
```

Sample Output

```
LOSE
NONE
WIN
NONE
```

Explanation

We must evaluate the following $g = 4$ games:

1. Alexis loses this game because there are $k = 3$ consecutive `X`'s in both the horizontal and vertical directions. Thus, we print `LOSE` on a new line.
2. Neither player has marked $k = 3$ consecutive cells, so nobody wins and we print `NONE` on a new line.
3. Alexis wins this game because there are $k = 3$ consecutive diagonal cells marked with `O`. Thus, we print `WIN` on a new lne.
4. Because *both* players marked $k = 3$ consecutive cells, neither can win. Thus, we print `NONE` on a new line.