Checkmate (750 points)

Introduction

Eve wants to play chess with Bob. But Bob is so good at chess that Eve knows that she would lose against him for sure.
Bob is such a nice friend that he suggested she can make a chess game with her own rules as long as moving rules are maintained and the goal stays as checkmate.

After some thinking she came up with these rules:
-Eve always starts first.
-Eve can choose any side of the board.
-Each player will choose one and only one figure to move on each round.
-The player can make as many moves as he wants with the same figure.
Eve wants to win the game in one round and as she likes to cheat she asks you to help her with a program to win.

Given the initial board and following Eve's rules print out:
- The side of the board to take **S** (white or black)

- The figure to choose **F**

- The minimum number of moves **M**.

You can check movement rules in https://en.wikipedia.org/wiki/Chess#Movement .
The count of figurines for each player could vary but they must satisfy:
- **count(K) = 1**
- **count(Q) ≤ 1**
- **count(N) ≤ 2**
- **count(B) ≤ 2**
- **count(R) ≤ 2**

For simplicity, there will be NO pawns on the board and the king can NOT castle.

If both players can make the minimum number of moves print the white.
Priority(White) > Priority(Black)

If many figures can make the minimum number of moves for the same player print the figure with the highest priority.
Priorities are as follow:
Priority(King) > Priority(Queen) > Priority(Bishop) > Priority(Knight) > Priority(Rook)

It is guaranteed that there will be always a solution.

Input Specifications

First line contains one number **G** which is the number of games to be played.
For each game you get one line with two numbers **R**, **C** : numbers of rows and columns of the board.
Followed by R lines each with C characters describing one line of the initial board.

An empty cell will have a dot '.' The figures for the white player will be marked **K** (King), **Q** (Queen), **B** (Bishop), **N**(Knight) and **R** (Rook). The black player will have the same letters but in lower case i.e. **k**, **q**, **b**, **n** and **r.**

1 ≤ G ≤ 10
2 ≤ R,C ≤ 100

Output Specifications

For each game print in one line **S**, **F** and **M**
For example, if Eve needs to choose the white player and play 2 moves with queen for checkmate the solution would be:
W Q 2

Sample Input/Output

Input

```
1
4 5
.K..N
.....
.....
.n.k.
```

Output

```
W N 2
```

Explanation

The white knight can get to the black king in two steps

Input

```
1
4 4
k.B.
....
..q.
.K..
```

Output

```
B q 1
```

Explanation

The white bishop can get to the black king in 2 steps. However the black queen can get to the white king in 1 step.