Competitive Programming SS24

Submit until end of contest

Problem: boxing (3.0 second timelimit)

Your greatest passion is boxing but during lock down you also refined your chess skills. Now you are ready to pursue your biggest goal: Becoming chess boxing[1] world champion! In chess boxing you and your opponent compete in mixed rounds of chess and boxing. After every chess move there is a short round of boxing. In this simplified chess variant you win the match if you are able to capture your opponent's king.

Currently your situation on the chess board is looking hopeless. Even though you are playing with the white pieces, your opponent is only one round of boxing and one chess move away from winning the chess match, shattering your dreams of chess boxing trophies. Your only way out is to cheat during the fight. Every time you land a good hit on your opponent, he is distracted for a while and your trainer can secretly move one of your pieces on the chess board. If he is able to capture your opponent's king during your last boxing fight you can still win the match.

The options of your trainer are limited: He can only move knights because no one will notice their tricky maneuvers and he will only make legal knight moves, so he can only move two steps in one direction and one step in another direction $90°$ from the first one. Also he can take your opponent's pieces if he lands on a square containing a piece but he obviously cannot take your own pieces. Determine if you still stand a chance to win the match and the minimum number of good hits to do so.

Input The first lines contains two numbers w and h $(1 \leq w, h \leq 1000)$, the width and the height of the chess board. The next h lines contain the rows of the board.

The character `'.'` denotes an empty square. The pieces are denoted by their standard notation: `'K'` is the king, `'Q'` means queen, `'R'` means rook, `'B'` is a bishop, `'N'` is a knight and `'P'` is a pawn. Uppercase characters represent white piece and lowercase characters stand for black pieces.

It is guaranteed that both players have exactly one king. There can be any number of other pieces.

Output If there is no way to win print `'Resign'`, else print `'Checkmate in x'` where x is the minimum number of good hits to take your opponent's king. Next print x lines describing the moves your trainer should make. Each line should contain four numbers r_1, c_1 and r_2, c_2 $(1 \leq r_1, r_2 \leq h; 1 \leq c_1, c_2 \leq w)$ denoting a jump from row r_1, column c_1 to row r_2, column c_2 with one of your knights on that move. The square $(1, 1)$ is the bottom-left square. If there are multiple solutions you can print any of them.

[1] https://en.wikipedia.org/wiki/Chess_boxing

Sample input

```
4 4
rkbr
pppp
..PP
RKN.
```

Sample output

```
Checkmate in 2
1 3 3 4
3 4 4 2
```

```
5 3
.N.K.
NkN..
.N..N
```

```
Checkmate in 3
1 2 3 3
3 3 1 4
1 4 2 2
```

```
2 2
KN
Nk
```

```
Resign
```