Chess

Time limit: 2 sec.
Memory limit: 512MB

Description

Minkyu and Sungsoo were playing a game of chess. Jihun, who was spectating the game, is new to chess. Therefore, he does not know the name of the chess pieces.

Jihun got curious about a particular chess piece's name. So he memorized that piece's move, and asked you about the piece's name. Can you help Jihun?

- Movement of chess pieces -

<King>

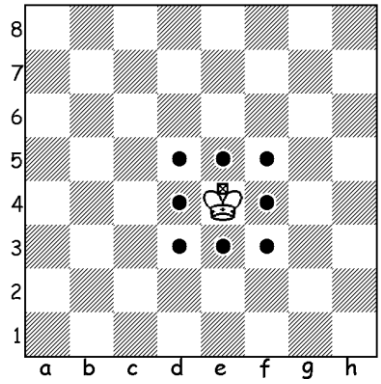

Figure 1) The movement of a King

A king moves exactly one square horizontally, vertically, or diagonally.

<Rook>

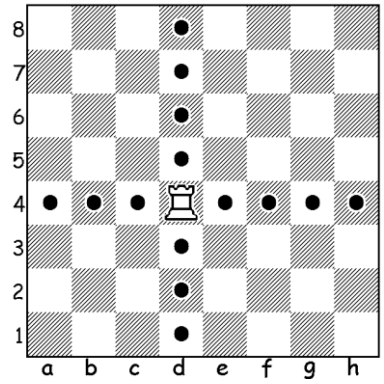

Figure 2) The movement of a Rook

A rook moves any number of squares in a horizontal or vertical direction.

<Bishop>

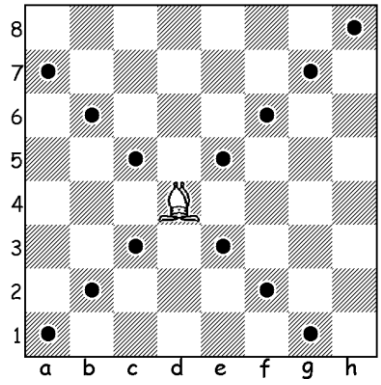

Figure 3) The movement of a Bishop

A bishop moves any number of squares in any diagonal direction.

<Queen>

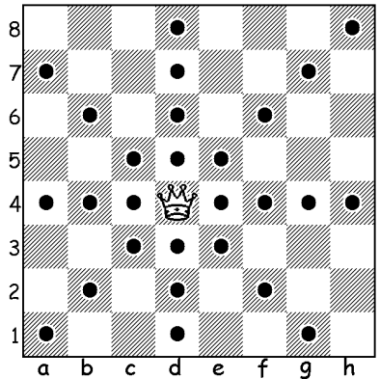

Figure 4) The movement of a Queen

A queen moves any number of squares in a horizontal, vertical, or diagonal direction.

<Knight>

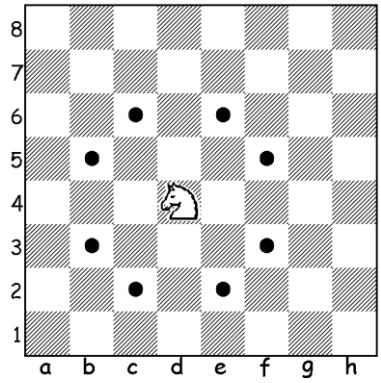

Figure 5) The movement of a Knight

A knight moves two squares horizontally then one square vertically, or moving one square horizontally then two squares vertically — i.e. in an "L" pattern.

Input

The first line contains a single integer n, the number of positions Jihun has memorized. ($2 \leq n \leq 10$)

The second line contains n chess board positions. Which denotes that a chess piece moved between these positions in a consecutive order. Since Jihun didn't spectate the game from the start, the starting position does not necessarily have a meaning. A chess board position is given by the form "x#", where x is an alphabet between 'a' and 'h', inclusive, denoting the file(vertical position), and # is a integer between 1 and 8, inclusive,

denoting the rank(horizontal position). For example, in Figure 1, the King is in the position "e4".

It is guaranteed that input is a valid movement of either a King, Rook, Bishop, Queen, or Knight.

Output

Print the name of the possible chess piece. If there are multiple possibilities, print all of them in lexicographical order, separated by whitespaces.

Sample I/O

Input(s)	Output(s)
2 d4 e6	Knight
3 e4 e5 f4	King Queen