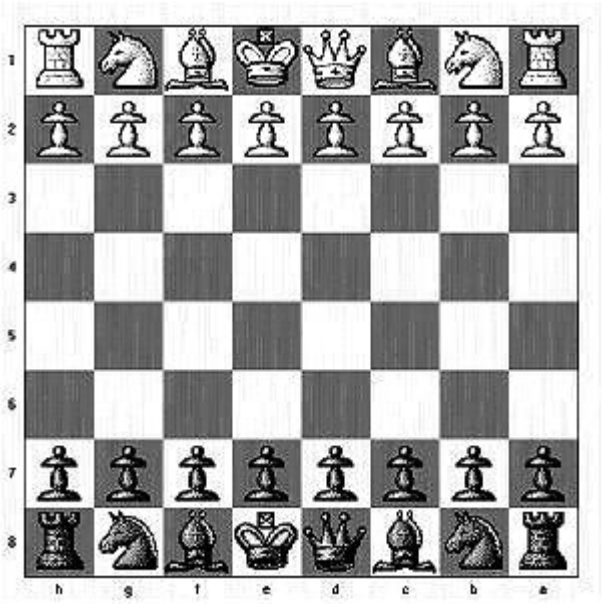
Kick Start 2014 - Round D

Itz Chess

Problem

Given an arranged chess board with pieces, figure out the total number of different ways in which any piece can be killed **in one move**. Note: in this problem, the pieces can be killed despite of the color.



For example, if there are 3 pieces King is at B2, Pawn at A1 and Queen at H8 then the total number of pieces that an be killed is 3. H8-Q can kill B2-K, A1-P can kill B2-K, B2-K can kill A1-P

A position on the chess board is represented as A1, A2... A8,B1.. H8

Pieces are represented as

- (K) King can move in 8 direction by one place.
- (Q) Queen can move in 8 direction by any number of places, but can't overtake another piece.
- (R) Rook can only move vertically or horitonzally, but can't overtake another piece.
- (B) Bishop can only move diagonally, but can't overtake another piece.
- (N) Knights can move to a square that is two squares horizontally and one square vertically **OR** one squares horizontally and two square vertically.
- (P) Pawn can only kill by moving diagonally upwards (towards higher number i.e. A -> B, B->C and so on).

Input

The first line of the input gives the number of test cases, **T**. **T** Test cases follow. Each test case consists of the number of pieces , **N**. **N** lines follow, each line mentions where a piece is present followed by **-** with the piece type

Output

For each test case, output one line containing "Case #x: y", where x is the test case number (starting from 1) and y is the the total number of different ways in which any piece can be killed.

Limits

Time limit: 30 seconds per test set.
Memory limit: 1 GB.
1 ≤ **T** ≤ 100.

Small dataset (Test Set 1 - Visible)

1 ≤ **N** ≤ 10.
Pieces can include K, P

Large dataset (Test Set 2 - Hidden)

1 ≤ **N** ≤ 64.

Sample

Sample Input

```
2
2
A1-K
A8-Q

3
B2-K
A1-P
H8-Q
```

Sample Output

```
Case #1: 1
Case #2: 3
```