2381 Triangles

Write a program that, given an $N \times N$ matrix of characters, determines the number of non-trivial single-character filled "standard" triangles in that matrix.

A "standard" triangle is an isosceles right triangle, with either:

a) the legs aligned along any two dimensions of the matrix, for example:

```
A          BBB
AA         BB
AAA        B
```

b) the hypotenuse aligned along any one dimension of the matrix, for example:

```
          B
 A       BB
AAA     BBB
AAAAA    BB
          B
```

(These don't look like right triangles, because the font isn't perfectly square, but they are in terms of the matrix).

No other triangles are counted.

A non-trivial triangle must contain at least 3 letters (a single letter is a trivial triangle).

Input

The input for your program will be a sequence of matrices. Each matrix will start with a dimension (N) that will be less than twenty, followed by N rows of N upper-case letters. The input ends with a single zero (0) as the dimension.

Output

For each matrix, you should print the total number of non-trivial right triangles in parentheses, followed by the number of non-trivial triangles for each character in the matrix.

Sample Input

```
3
AAB
ABB
BBB
4
AABB
ABBB
BBBB
BBBB
0
```

Sample Output

```
(10) 1 A 9 B
(51) 1 A 50 B
```