ACM North Central North America Programming Contest
November 10, 2001

Problem 6: Triangles

Filled triangular patterns can appear in blocks of text. In this problem you are to identify as many of these non-trivial triangular patterns as possible, and report on the number of them that are located. The input will consist of a square block of text with N characters on each side.

A "standard" triangle is either (a) an isosceles right triangle, with the legs of the triangle aligned along any two dimensions of the matrix, as in these examples:

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

or (b) an equilateral triangle, with the hypotenuse aligned along any one dimension of the matrix, as in these examples:

```
   B
 A BB
AAABBB
AAAAA BB
    B
```

Triangles must be at least two characters wide; a single character is a trivial triangle.

Input

The input for your program will be a sequence of matrices. Each matrix will start with an integer *N* on a line by itself that indicates the size of the matrix, followed by *N* rows each containing *N* upper-case alphabetic characters. The last matrix is followed by an integer 0 on a line by itself.

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
```

Expected Output

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