

F. Monkey King

Time limit: 1s

Memory limit: 1536 MB

There is a king name Monkey. He love bananas so much. In his kingdom there is big field which contains many banana trees. We can represent this field as a 2D grid. In this grid some of the cells are contains banana tree, some of them are empty and some of the cells are for tax area. If you select a cell which contains a banana tree then you can earn a banana and if you select a cell which is tax area then you must pay a banana to Monkey King.

Monkey king is really an intelligent man like a monkey. Today he gets an excellent idea. He wants to give you a chance to earn some bananas. But there is a condition for that. That condition is you can select only a square area from this field (2D grid).

Now Monkey King wants to know how many bananas (as much as possible) you can earn from this field.

Input

Input starts with an integer T ($T \leq 213$), denoting the number of test cases.

Each case starts with a line containing two integers r and c ($1 \leq r, c \leq 100$), r denotes the number of rows and c denotes the number of columns of the modeled grid. Each of the next r lines contains c characters representing the field.

You can assume that there will only three kinds of character and those are 'B', '.' and 'T'. 'B' for banana tree, '.' For empty and 'T' for tax area.

Output

For each case print the case number and the maximum number of banana you can earn.

Example

Input :

2

3 3

BBB

BBB

BBB

5 5

T.BBB

TBBBB

.BBBB

TBBBB

.BBBB

Output :

Case 1: 9

Case 2: 16