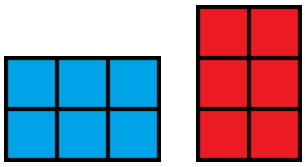
1310 – Tiles (III)

There is an **M x N** board, two types of tiles are available, and each of them is infinitely many, you have to place maximum number of non-overlapping tiles in the board. The tiles are given below:



You **cannot** rotate or flip any tile. Some cells in the board may be broken; you can't place any part of a tile in the broken cells.

Input

Input starts with an integer **T (≤ 100)**, denoting the number of test cases.

Each case starts with a line containing two integers: **M N (2 ≤ M ≤ 8, 2 ≤ N ≤ 100)**. Each of the next **M** lines contains **N** characters forming the board. There are two types of characters. A **'.'** means the cell is **not** broken; a **'#'** means the cell is **broken**.

Output

For each case, print the case number and maximum number of tiles that can be placed in the board.

Sample Input	Output for Sample Input
3 2 3 ... ... 2 3 ..# ... 5 6 .#.... ....#. ..#...	Case 1: 1 Case 2: 0 Case 3: 3