Sample Problem: Make an Entrance
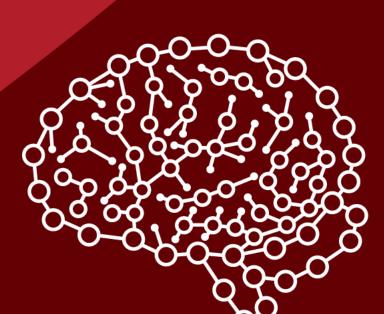
Time Limit: 3 seconds

The 20's are back again, and you want to go all out. That's why you've got a new mansion made for throwing swanky Gatsby-style parties. You've got one planned for this New Year's Eve celebration, but there seems to be one problem: Due to very hasty construction, none of your rooms have doors!

Currently, you have F square floor plans, all of side length N meters, with each one showing the *top view* of the room on that floor, the staircase going down, and the staircase going up. A **floor plan** is represented as an $N \times N$ grid. Each cell represents a 1×1 square meter of area and is either **empty space**, a **wall cell**, or a cell representing a **staircase**. There are two staircase cells; one going up and one going down. (This includes the topmost and bottommost floors; you have an attic and a secret lab in your house!)

A **room** is defined as a closed area bounded by walls with at least one unit of space. It is guaranteed that the whole area is enclosed by walls. In other words, leftmost column, the rightmost column, the topmost row and the bottommost row all consist of wall cells.

From any cell, you can only walk to any of the adjacent cells in one of the four cardinal directions. (There are at most four of them.) You can walk through any cell except wall cells.

As mentioned, there are no doors yet, but you have the ability to convert a wall cell into a **door cell**. You can also walk through door cells.

Of course, the proper thing to do is to add doors through every wall so that all rooms are accessible, but you're in a bit of a rush, so you decided you only need to be able to access the staircase cells from one another. What is the fewest number of doors you can add such that there is a path from the staircase going down and the staircase going up?

Input

The first line contains an integer F, the number of floor plans you have, where $1 \le F \le 10$.

The second line contains an integer N, the length of one side of the square floor plan (in meters), where $4 \le N \le 1000$.

The F floors are then described in the following $F \cdot N$ lines. For each floor plan, there will be N lines, each containing N characters denoting a row of the grid.

There are 4 possible characters:

- '**.**' - An empty cell

- '$\mathbb{X}$' - A wall cell

- '$\mathbb{A}$' - the staircase leading down; there is only one per floor

- '$\mathbb{B}$' - the staircase leading up; there is only one per floor

Output

Output a single line containing an integer D indicating the minimum number of doors you need to make, counting all floors.

Sample Input	Sample Output
3 8 XXXXXXXX X.A....X X......X XXXXXXXX X......X X......X X....B.X XXXXXXXX XXXXXXXX X..X..BX X..X...X X..XXXXX X......X X.XXXXXX X.X..A.X XXXXXXXX XXXXXXXX XBX..XAX X.X..X.X XXXXXXXX X......X X......X X......X XXXXXXXX	5