Problem Jumpy

Input file	stdin
Output file	stdout

Little Square and Little Triangle play a game of Jumpy. In this game they alternately control Jumpy the carpenter as he runs around a rectangular board formed out of $N \times M$ cells. Each cell is either blocked, blue, red or green. All the cells (including the one on which Jumpy starts) are blue initially. When Jumpy jumps on a blue cell, it becomes red. It stays red until he jumps on a different cell, at which point it becomes green. Jumpy cannot jump pass a blocked cell (these cells are essentially walls).

Little Square and Little Triangle are allowed to play only in a very particular way: Little Square can only jump horizontally (left and right), Little Triangle can only jump vertically (up and down). How do we decide who wins? If any player jumps on a red cell, they *lose* immediately. If any player jumps on a green cell, the *win* immediately. We are interested who would win if Jumpy started in various positions, in the case in which either Little Square or Little Triangle moves first, and both play optimally.

Input file

The first line of the input file will contain N and M, the dimensions of the board.

The next N lines will contain M characters, either . (which represents an empty cell) or # (which represents a blocked cell). These represent the playing field.

Output file

The output file will contain N lines each with M characters, representing the answers for each cell.

If a cell is blocked, output #. If neither player would win if they moved first starting in a cell, output N. If both players would win if they moved first starting in a cell, output B. If only Little Square would win if they moved first starting in a cell, output S. If only Little Triangle would wind if the moved first starting in a cell, output T.

Constraints

- $1 \leq N, M \leq 500$

Subtask 1 (30 puncte)

- $1 \leq N * M \leq 20$

Subtask 2 (10 puncte)

- There are no blocked cells.

Subtask 3 (10 puncte)

- There is at most 1 blocked cell.

Subtask 4 (20 puncte)

- The graph whose nodes are the unblocked cells, with an edge between adjacent unblocked cells, is a forest.

Subtask 5 (20 puncte)

- $1 \leq N, M \leq 300$

Subtask 6 (10 de puncte)

- No additional constraints.

Examples

input	output
9 9 ....#..#. .####..#. ....#. .#..#.##. .#..#.... ########. ....#.... ##.##.##. ....#.	BSSS#TT#T T####TT#T BSBBSBB#T T#BB#T##T T#BB#BSSB ########T SSBS#BSSB ##B##B##T SSBSSBS#T
5 5 ...#. .###. ...#. ##.#.	BSS#T B###T BBB#T ##B#T SSBSB