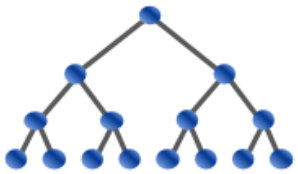

USACO 2014 DECEMBER CONTEST, BRONZE
PROBLEM 2. CROSSWORDS

Problem 2: Crosswords [Mark Gordon, 2014]

Like all cows, Bessie the cow likes to solve crossword puzzles. Unfortunately, her sister Elsie has spilled milk all over her book of crosswords, smearing the text and making it difficult for her to see where each clue begins. It's your job to help Bessie out and recover the clue numbering!

An unlabeled crossword is given to you as an N by M grid (3 <= N <= 50, 3 <= M <= 50). Some cells will be clear (typically colored white) and some cells will be blocked (typically colored black). Given this layout, clue numbering is a simple process which follows two logical steps:

Step 1: We determine if a each cell begins a horizontal or vertical clue. If a cell begins a horizontal clue, it must be clear, its neighboring cell to the left must be blocked or outside the crossword grid, and the two cells on its right must be clear (that is, a horizontal clue can only represent a word of 3 or more characters). The rules for a cell beginning a vertical clue are analogous: the cell above must be blocked or outside the grid, and the two cells below must be clear.

Step 2: We assign a number to each cell that begins a clue. Cells are assigned numbers sequentially starting with 1 in the same order that you would read a book; cells in the top row are assigned numbers from left to right, then the second row, etc. Only cells beginning a clue are assigned numbers.

For example, consider the grid, where '.' indicates a clear cell and '#' a blocked cell.

```
...
#..
...
..#
.##
```

Cells that can begin a horizontal or vertical clue are marked with ! below:

```
!!!
#..
!..
..#
.##
```

If we assign numbers to these cells, we get the following;

```
123
#..
4..
..#
```

```
.##

Note that crossword described in the input data may not satisfy
constraints typically seen in published crosswords.  For example, some
clear cells may not be part of any clue.

INPUT: (file crosswords.in)

The first line of input contains N and M separated by a space.

The next N lines of input each describe a row of the grid.  Each
contains M characters, which are either '.' (a clear cell) or '#' (a
blocked cell).

SAMPLE INPUT:

5 3
...
#..
...
..#
.##

OUTPUT: (file crosswords.out)

On the first line of output, print the number of clues.

On the each remaining line, print the row and column giving the
position of a single clue (ordered as described above).  The top left
cell has position (1, 1).  The bottom right cell has position (N, M).

SAMPLE OUTPUT:

4
1 1
1 2
1 3
3 1
```

Language: C ▼

Source File: Choose File No file chosen

Submit Solution

Note: Many issues (e.g., uninitialized variables, out-of-bounds memory access) can cause a program to product different output when run multiple times; if your program behaves in a manner inconsistent with the official contest results, you should probably look for one of these issues. Timing can also differ slightly from run to run, so it is possible for a program timing out in the official results to occasionally run just under the time limit in analysis mode, and vice versa. Note also that we have recently changed grading servers, and since our new servers run at different speeds from the servers used during older contests, timing results for older contest problems may be slightly off until we manage to re-calibrate everything properly.