British Informatics Olympiad Final

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Paper Cuts - Part One

Given a rectangular sheet of paper which has had shapes drawn upon it, we are interested in determining how to cut these shapes out. The only tool available to us is a paper guillotine, a device that can only cut across a full length of paper (parallel to the sides). Once a piece of paper has been cut in two we treat the pieces separately.

You are to write a program which determines how to cut the shapes out of a patterned piece of paper. The first line of the input file will contain two integers x and y (both ≤ 40), the size of the paper. The next y lines will each contain x lower-case alphabetic characters. Each shape on the paper will be represented by a solid block of the same character (not necessarily rectangular). No two blocks will use the same character.

Each line of your output should consist of two pairs of numbers, representing the start and end co-ordinates of your cut. If you do not believe you can cut out all the pieces you should only output `Impossible`. Note that your cuts take place between the patterned blocks; eg. (0,0) is the point at the bottom left of the bottom left character, and (1,1) is the point the the top right of the same character.

Sample Input

```
6 4
aaagll
aaagll
tttgll
tttvll
```

Sample Output

```
(3,0) (3,4)
(4,0) (4,4)
(0,2) (3,2)
(3,1) (4,1)
```