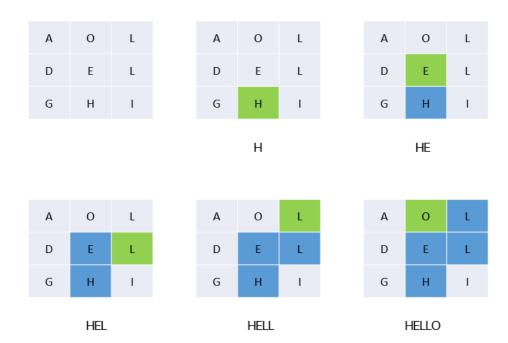## 28 Boggle Search
19 points

Introduction

Boggle is a word game where players try to find as many words as possible by connecting adjacent letters on a rectangular lettered grid. It's a fun and challenging game that tests your vocabulary and pattern recognition skills.

The following sequence shows the steps to find the word HELLO on a board.

Please notice that given a letter, the valid adjacent letters to continue composing a word are the letters that can be found up, down, left and right to the last letter selected. A letter cannot be visited twice. In case of words with a letter repeated consecutively, that letter must appear repeated also in the board. To report the sequence to find a word follow this coordinate system:

So, the coordinates sequence for HELLO is (2,1), (1,1), (1,2), (0,2) and (0,1).

To make things easier a word will appear only once in a boggle board. Can you write a program that finds out a word and provides the corresponding sequence of coordinates?

Input

First line contains the word to find.
Second line is a positive integer representing the number of rows of the boggle board.
Finally, the content of every row with the letters contained in it.

Output

The output is the sequence of coordinates to find the word. Otherwise, the program must print out that the word has not been found.

Example 1

Input

```
HELLO
3
A O L
D E L
G H I
```

Output

The word HELLO can be composed following the path: (2,1), (1,1), (1,2), (0,2) and (0,1).

Example 2

Input

```
HELP
5
A O L S
D E L O
G H I P
X D F Q
H E L X
```

Output

The word HELP has not been found.