

## STA Online Computer Programming Contest (DWITE)

### Problem 4

## WORD SEARCH

Given an  $m$  by  $n$  grid of letters,  $1 \leq m, n \leq 25$ , and a list of words, find the location in the grid at which the word can be found. A word matches a straight, uninterrupted line of letters in the grid. A word can match the letters in the grid regardless of case (i.e. upper and lower case letters are to be treated as the same). The matching can be done in any of the eight directions either horizontally, vertically or diagonally through the grid.

The input file (DATA4) begins with a pair of integers,  $m$  followed by  $n$ , separated by a space on a single line. The next  $m$  lines contain  $n$  letters each. This is the grid of letters in which the words of the list must be found. The letters in the grid may be in upper or lower case. Following the grid of letters, there will be 5 lines of input containing the list of words to search for, one word per line. These words may contain upper and lower case letters only (no spaces, hyphens or other non-alphabetic characters).

In the output file (OUT4), a pair of integers representing the location of the corresponding word in the grid must be output, for each word in the word list. The integers must be separated by a single space. The first integer is the line in the grid where the first letter of the given word can be found (1 represents the topmost line in the grid, and  $m$  represents the bottommost line). The second integer is the column in the grid where the first letter of the given word can be found (1 represents the leftmost column in the grid, and  $n$  represents the rightmost column in the grid). If a word can be found more than once in the grid, then the location which is output should correspond to the uppermost occurrence of the word (i.e. the occurrence which places the first letter of the word closest to the top of the grid). If two or more words are uppermost, the output should correspond to the leftmost of these occurrences. All words can be found at least once in the grid.

### Sample Input

```
6 7
HEOPEDS
ULPukns
Cndsehi
gfacdhp
enGYERs
AQUINAS
hElp
Open
ship
aquinas
caN
```

### Sample Output

```
1 1
1 3
2 7
6 1
4 4
```