Siena College's 32ⁿᵈ Annual High School Programming Contest
Sponsored by Transfinder
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Gold Problem #4: GRID LOCK or GRID UNLOCKED

Background Information:

A crucial skill taught in American elementary schools is the ability to do a word search. Students learn to find words in a two dimensional grid of letters. Words may hidden in the grid in the horizontal, diagonal, or vertical direction. The words must be in a straight line.

Word Search: Colors

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B  X  H  P  B  L  A  C  K
B  G  O  I  E  F  W  F  I
N  Y  Q  N  P  D  H  A  Q
Q  G  T  K  G  R  E  E  N
W  H  I  T  E  B  L  U  E
O  R  A  N  G  E  G  U  X
U  B  L  Y  E  L  L  O  W
K  X  M  G  Z  P  D  R  R
B  R  O  W  N  T  R  E  D
```

BLACK   PINK
BLUE   RED
BROWN   WHITE
GREEN   YELLOW
ORANGE

Programming Problem:

Input: On the first input line, positive integers R and C, $1 \le R, C \le 16$ indicating the number of rows and columns in the search grid. This will be followed by R strings of length C. The strings are uppercase letters that form the R by C grid. These lines of input are followed by a positive integer $N \le 20$ for the number of words that will be searched for in the grid. Finally, there will be N lines of input, each with a word to search for.

Output: N lines of output, one for each word the program tries to find in the grid. Each output line consists of the searched for word followed by either FOUND or NOT FOUND.

Example 1:   Input   3 6
                         ESUOMG
                         XDAQOJ
                         BWSDNL
                         4
                         CAT
                         MOUSE
                         DOG
                         TRANSFINDER

            Output: CAT NOT FOUND
                         MOUSE FOUND
                         DOG FOUND
                         TRANSFINDER NOT FOUND