Problem 4: It Boggles the Mind

Source filename:	`boggle.cpp`
Input filename:	`boggle.in`
Output filename:	`boggle.out`

The game of **Boggle** is played by forming words of three letters or more from a 4x4 array of letter cubes randomly arranged in a letter grid as shown below.

Words are formed from *adjoining* letters, starting with any letter cube in the grid. Letters must join in the proper sequeunce to spell a word. *Adjoining* letters may join horizontally, vertically, or diagonally to the left, right, or up-and-down. No letter cube, however, may be used more than once within a single word.

For example, the word SCIENCE can be formed in the above grid in the following way:
1 – Begin with the 'S' in the upper left corner of the grid.
2 – Move diagonally down to the right to the letter 'C'.
3 – Move diagonally down to the left to the letter 'I'.
4 – Move vertically up to the letter 'E'.
5 – Move diagonally up to the right to the letter 'N'.
6 – Move diagonally down to the right to the letter 'C'.
7 – Move either vertically up or diagonally down to the right to the letter 'E'.

It is your job to write a program that will validate words against a particular array of letter cubes. The first four lines of the input file contain the letter cube array, 4 letters per line. Each line following the 4th line contains a word to be validated. The end of the input file is indicated by a line that contains a single asterisk, '*'.

Your program should indicate whether or not the specified words can be formed from the specified letter cube array. A valid word is a word that conforms to all of the rules outlined above.

All characters in the input file will be in upper case; and all words to be validated will range from 3 to 16 characters in length.

Each line of the output file should contain a word left-justified within a field of 17 spaces followed by either the word "VALID" or the words "NOT VALID".

Sample Input File (`boggle.in`)

```
HDRU
RAIG
RNVN
DIUS
HARDING
RAIN
RAINS
DRAIN
SUN
SUNS
*
```

Sample Output File (`boggle.out`)

```
HARDING         VALID
RAIN            VALID
RAINS           VALID
DRAIN           VALID
SUN             VALID
SUNS            NOT VALID
```