Problem
Grammy's Puzzle

Input File: GrammyIn.txt
Output File: GrammyOut.txt
Program File: Grammy

Your Grammy is a retired English teacher who always enjoyed solving puzzles. As a retirement gift, you gave her a puzzle book that contains hundreds of hidden word puzzles. These puzzles are a square arrangement of letters (in rows and columns) that sometimes form words. To solve the puzzle, you have to locate the row and column of the first letter of a given word, and determine the orientation of the remainder of the word. Words can be oriented in any of eight directions: north, northeast, east, southeast, south, southwest, west and northwest. The orientation of a one letter word will always be north.

Grammy would like to spend some "quality time" with you solving these puzzles. Unfortunately, you hate this kind of puzzle. Rather than disappoint her, you have decided to write a program to solve the puzzle. You may assume a given word will always be in the puzzle and that there will be only one occurrence of the word in the puzzle. Assume the upper left corner of the puzzle is row 0, column 0.

Inputs
The first input to the program will be the number of rows (columns) in the puzzle (50 maximum). This will be followed by the letters in each row of the table, one row per input line. Finally, the words to be located will be given, one per line.

Outputs
Your program should output one line for each word to be located. This line will contain the row and column number where the word begins in the puzzle and an upper case letter indicating the orientation of the word: A for north, B northeast, C for east, D for southeast, E for south, F for southwest, G for west and H for northwest.

Sample input	Sample output
10	8 1 C
DFRETFGTYH	7 0 A
JUILHOUSPU	4 3 d
RNBHYUJHTG	5 4 A
EMNJHBGRED	
WDFATGHYUJ	
OJNHXGYUJI	
LYDFGHUJNB	
FJUYHNBGTR	
AHOUSEFRED	
MKJHBGYPLA	
HOUSE	
FLOWER	
AX	
X	