

Problem 5. Crossword (250 points)

Ivancho woke up in the sunday morning after great party. Sadly, he remembered that he was given an enormous homework for the physics class tomorrow. Ivancho remembered his best years at school and how exciting it was. The classes were so interesting that he found his new hobby - crossword solving. Although he really loves solving crosswords, Ivancho does not have enough time for this now and there are some unsolved crosswords left.

So he is asking you for help. Ivancho's crosswords are tables with **R** rows and **C** columns, that are filled with uppercase latin letters. Ivancho knows that there are **W** hidden words in each the crossword. Each word could be described by the cell of its first letter and the direction (the orientation in which the word is written). The directions are:

- "A" means up
- "B" means upper-right diagonal
- "C" means right
- "D" means lower-right diagonal
- "E" means down
- "F" means lower-left diagonal
- "G" means left
- "H" means upper-left diagonal

Your task is for each word to find where it is hidden in the crossword (table) by printing the coordinates of its first letter and the direction that should be followed.

Input:

The first line of the input file crossword.in contains three natural numbers **R**, **C** and **W** ($1 \leq R, C, W \leq 1000$). The rows of the table, the columns of the table and the number of words that you should find in the table. Each of the following **R** rows contains **C** uppercase latin letters - the letters in the crossword. The last **W** lines of the input file contain the words which you should find - each word is on a single line. The length of each word is constrained by the size of the table and each word is consisted of uppercase latin letters. Each word could be found only once in the table.

Output:

The output file crossword.out should contain **W** lines - a single line for each word. For each word (in the order given in the input file) print three space-separated symbols - the coordinates of the first letter(the index of the row and column) and the uppercase latin letter corresponding to the direction that should be followed in order to find the word.

Example input:

3 5 8
ABCDE
FGHIJ
KLMNO
KFA
BG
LHD
GA
EIM
BH
JIH
LMNO

Example output:

2 0 A
0 1 E
2 1 B
1 1 H
0 4 F
0 1 D
1 4 G
2 1 C