First letters in each direction and all possible sequences

(i) First letters in each directions

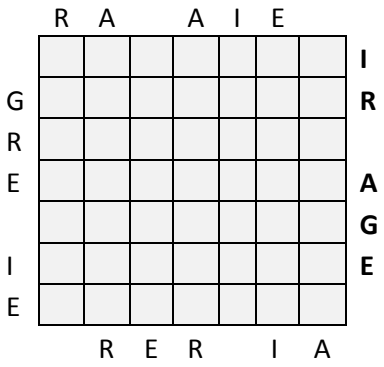
Each letter from the given set occurs once (and exactly once) in each row and each column.

One or more cells may remain empty in each row and column (the exact number of blank cells in a row or column is obviously equal to number of cells in column/row minus the number of letters in the set)

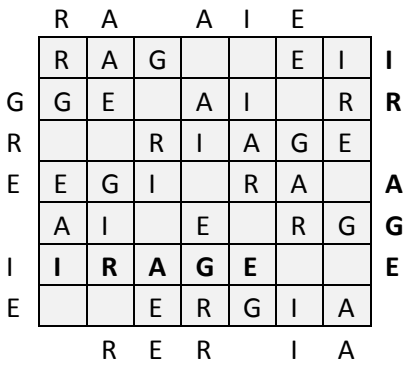
The letters outside the grid show which letter is visible first from that direction.

Sample problem:

(Sample Set: 'I', 'R', 'A', 'G', 'E')



Solution of sample problem:



Format for the puzzle input file

Puzzle_input.csv
6 lines with the following information per line:

1) Grid size
2) Set of letters
3) Comma separated list of first letters for each column from the top (from left to right) (X denotes blank input)
4) Comma separated list of first letters for each column from the bottom (from left to right) (X denotes blank input)
5) Comma separated list of first letters for each row from the left (from top to bottom) (X denotes blank input)
6) Comma separated list of first letters for each row from the right (from top to bottom) (X denotes blank input)

For the above puzzle, the input will be:

7
I,R,A,G,E
R,A,X,A,I,E,X
X,R,E,R,X,I,A
X,G,R,E,X,I,E
I,R,X,A,G,E,X

Format for the puzzle output file

Comma separated values for each row (from left to right) – one line for each row (rows should be printed from top to bottom)

For the solution to the above puzzle, the output should be:

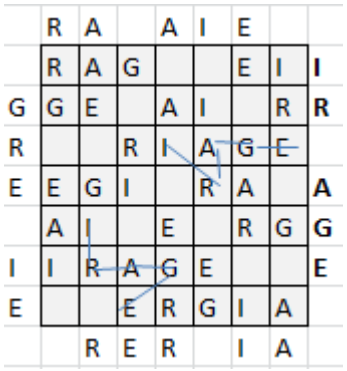
R,A,G,X,X,E,I
G,E,X,A,I,X,R
X,X,R,I,A,G,E
E,G,I,X,R,A,X
A,I,X,E,X,R,G
I,R,A,G,E,X,X
X,X,E,R,G,I,A

(ii) All possible sequences

What is considered as a sequence?

1) A set of connected cells (that can be connected either orthogonally (0^o, 90^o, 180^o or 270^o) or diagonally (i.e. 45^o.135^o, 225^o,315^o)).
2) The letters encountered in the set of connected cells is the sorted letters of the set within the solved grid (the sequence should start from the first letter in the set and then go on to the next letter in the sequence and so on)

For e.g. two of the possible sequences are highlighted below:

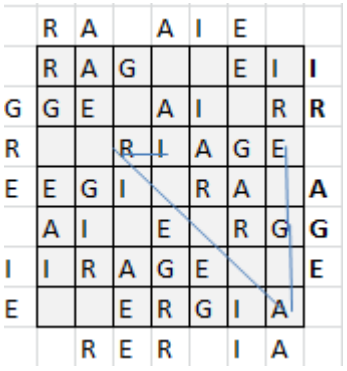


Please provide two answers –

(i) All instances of sequences which do not have blank cells in between

(ii) All instances of sequences with blank cells in between (connections could only be either orthogonal (0^o, 90^o, 180^o or 270^o) or diagonal (i.e. 45^o.135^o, 225^o,315^o))

An example of a sequence with blank cells in between would be:



Format for the puzzle output file

First line would contain the count of the number of sequences.

The next line onwards would have one line for each sequence

Each line will have the list of cells

The cell will be written as R*row_number*C*cell_number* where *row_number* and *column_number* denote the location of the cell.

For the example provided of a sequence with in blanks in between, the output will be:

n

R3C4,R3C3,R7C7,R5C7,R3C7