Word Puzzle

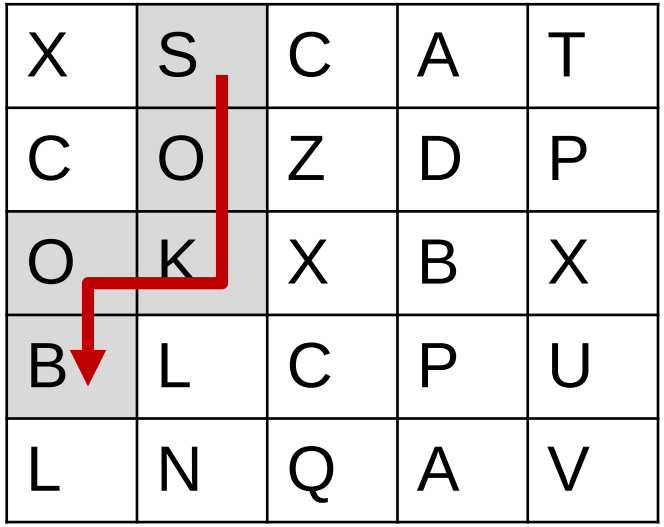
Data Structures Assignment 2
Stacks and Queues

NTHU EECS
2019

https://acm.cs.nthu.edu.tw/problem/12195/

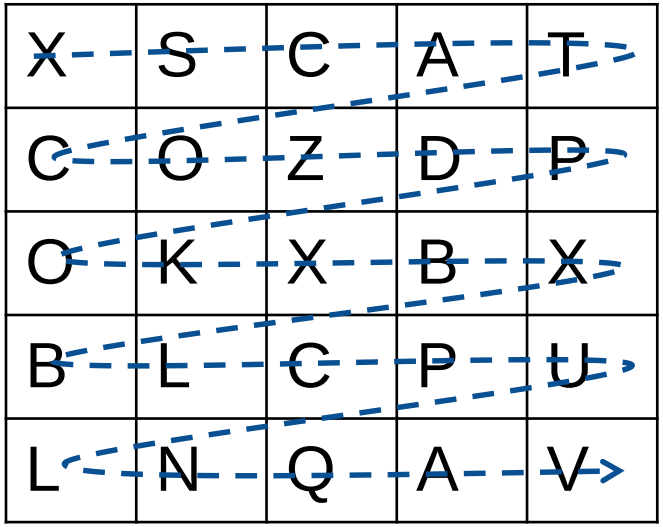
Objective

- Find all possible 'words' in a given matrix

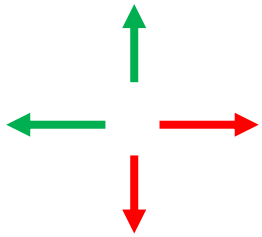


Rules

- Select a *starting cell* from left to right and from top to bottom



Rules



- For each *starting cell*, you should output *all paths* producing legal words according to the following *priorities (優先順序)*
  - down
  - right
  - up
  - left

- Each word/path cannot use the same cell more than one time

Rules

- Matrices consist of 26 lowercase characters, where:
  - “a”, “e”, “i”, “o”, and “u” are vowels
  - Others are consonants子音

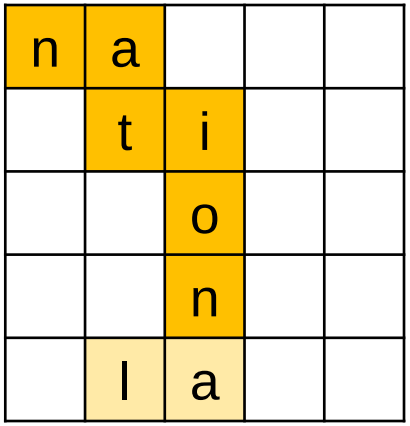
- Legal word formats are:
  - The length of the word >= 5
  - The regular expression is: $cv^{+}(c(v)^{+})^{+}c$
    - Where c is a consonant and v is a vowel
    - ‘+’ means once or more

Examples

- Bad words
  - book
  - boook
  - break
  - apple
- Legal words
  - bokok
  - bokaeiouk
  - nation
  - national

Rules

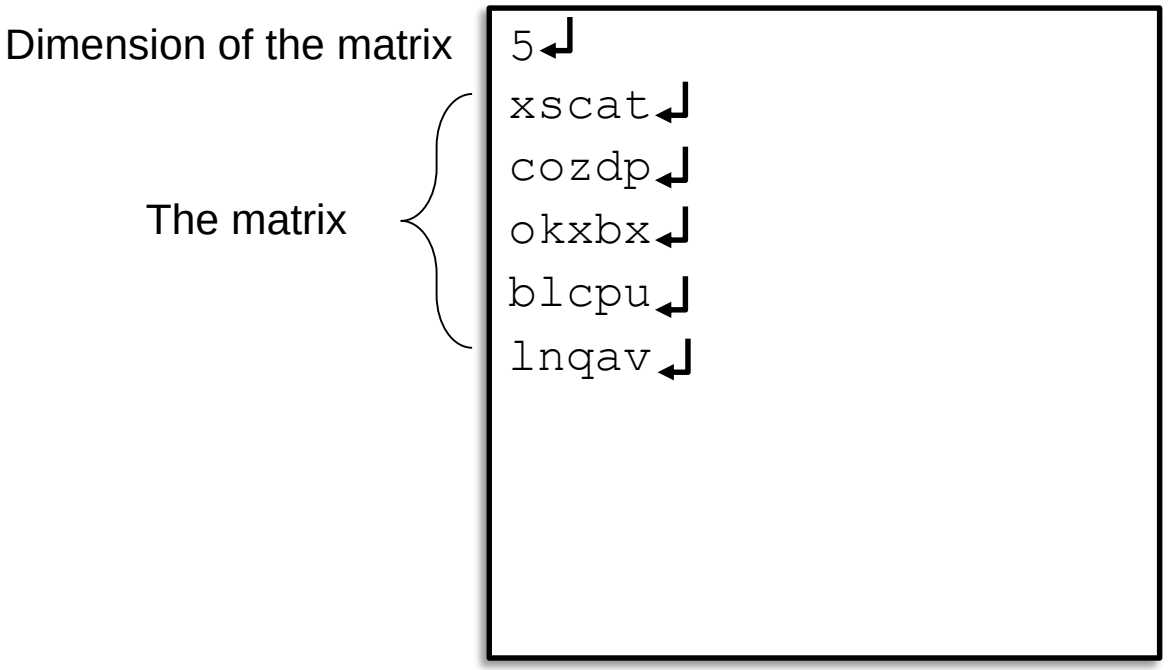
- You should output all possible words in one path
  - The following path contains two legal words, "nation" first and then "national"



Rules

- You should also output the rearranged word in a different format
  - Vowels should be put in the beginning of the word
  - Where “nation” becomes “aiontn”

Sample Input



Output

- All possible ‘words’ in the puzzle
  - The 'word' in the traversal遍歷 order
  - The rearranged format of the word (vowels first)

Sample Output

sokob ooskb ↲
sokoc ooskc ↲
socob ooscb ↲
socok oosck ↲
cokoz oockz ↲
cokos oocks ↲
cokob oockb ↲
zokob oozkb ↲
zokoc oozkc ↲
zocob oozcb ↲
zocok oozck ↲
kocob ookcb ↲
kocoz ookcz ↲
kocos ookcs ↲
xuvap uaxvp ↲
xuvaq uaxvq ↲
xupav uaxpv ↲
xupaq uaxpq ↲

The second half…

bokoz oobkz ↲
bokos oobks ↲
bokoc oobkc ↲
bocok oobck ↲
bocoz oobcz ↲
bocos oobcs ↲
pavux aupvx ↲
puvaq uapvq ↲
qavux auqvx ↲
qavup auqvp ↲
qapuv auqpv ↲
qapux auqpx ↲
vupaq uavpq ↲
vapux auvpx ↲

Continue…