

Word Puzzle

Data Structures Assignment 2 Stacks and Queues



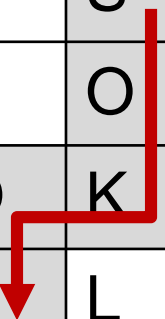
NTHU EECS
2019

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

Objective

- Find all possible 'words' in a given matrix

X	S	C	A	T
C	O	Z	D	P
O	K	X	B	X
B	L	C	P	U
L	N	Q	A	V

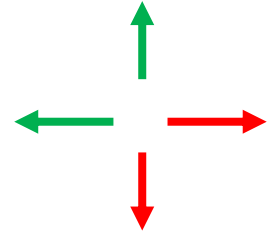


Rules

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

X	S	C	A	T
C	O	Z	D	P
O	K	X	B	X
B	L	C	P	U
L	N	Q	A	V

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

■ 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"

n	a			
	t	i		
		o		
		n		
	l	a		

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

Dimension of the matrix

The matrix

```
5↵
xscat↵
cozdp↵
okxbx↵
blcpu↵
lnqav↵
```

Output

- All possible 'words' in the puzzle
 - The 'word' in the traversal 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...