Word search   P19854_en
Olimpiada Informática Española — Final 2007 (2007)

You must solve a word search. ¿does it seem easy? It is, except for a little detail: we are not only going to allow that the words appear in rows, columns or diagonals, but also that "go round": when the board ends, the word can "continue" in the opposite side. ¿Look the following instance: do you find the word "abracadabra"?

```
z z a z z a z z d z z
r z z b z z c z z a z
z a z z r z z a z z b
```

A detail: we do not accept that the same letter of the word search corresponds to two or more different letters in the word. For instance, the following word search do *not* contain the word "abracadabra"; instead, it contains the word "zbzzbz" (in diagonal, not in vertical).

```
z z z z z z z z z z
a b r a b r a c a d
z z z z z z z z z z
```

Input

A test data contains various cases, separated by a line in white. Each case starts with three naturals separated by spaces, R, C and N. It is fulfilled that $3 \le F, C \le 100$ and $0 \le N \le 100$. Then, R lines follow with C lowercase letters each one of them, describing the word search. Finally, N lines, each one of them contains a non empty word formed by lowercase letters that you must search in the word search.

Output

Return the same board marking *all* the appearances of each word. Mark it writing with uppercase letters all the letters that are part of one of the words that you searchs. Consider that the same word can appear many times, once or never in the word search. Separe two cases with a line in white.

Score

- **(40 points)** Some test data will contain word searchs where *any* word will appear in diagonal, nor going round the board, as the ones in the instance 1.

- **(20 points)** Some test data will contain word searchs where *any* will not be any word that appear in diagonal, as the ones in the instance 2.

- **(40 points)** Other test data will contain cases of all kinds, as the ones in the instance 3.

Sample input 1

```
6 6 2
zzzzzz
```

```
zabcdz
zbcdez
zcdefz
zdefgz
```

zzzzzz
g
edcb

4 10 5
asorfliasd
iievneivja
aramapolaz
aifjlalsnd
amapola
rosa
iris
nenufar
azahar

Sample input 2

3 3 1
aaa
aaa
aaa
aaaa

10 10 5
ajfmcxzsdf
afijalifei
afdijfwiwf
dafjiljijw
afijwliejl
adifjvslid
ijiljwifwj
fvjdlsfsfj
ajeijwlijw
jilxzvzkqd
wajeij
jijmxi
fsiksfiiel
w
fvjdlsfsfjf

Sample input 3

3 10 1
zzazzazzdzz
rzzbzzczzaz
zazzrzzazzb
abracadabra

3 10 1
zzazzazzdzz
rzzbzzczzaz
zazzrzzazzb
zzzzz

3 9 2
zzzzzzzzzz
abrabracad
zzzzzzzzzz
abracadabra
zbzzbz

3 9 1
zzzzzzzzzz
abrabracad
zzzzzzzzzz
zbzzbzzczzazzazzazzd

Sample output 1

zzzzzz
zaBcdz
zBCDEz
zcDefz
zdEfGz
zzzzzz

ASORfliasd
iIevneivja
aRAMAPOLAz
aIfjlalsnd

Sample output 2

aaa
aaa
aaa

ajfMcxzSdf
afiJaliFei
afdIjfWIWf
dafJiljIjW
afijWliEjl
adifjvsLid
ijiljWiFWj
fvjdlsfSfj
AJEIJWlIjW
jilXzvzKqd

Sample output 3

zzaZZaZzdz
zrZZBZZczz
azZaZZrzza

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Problem information

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