CODECON

Memory Limit: 1024 MB
Time Limit: 5 s

Heraldic Heresy (200 points)

Introduction

Lotlair decided that giving each and every team in London a coat of arms would be great for team-building.

Ever conscious of costs, he outsourced the creation of them to one consultancy he found on teletext.

To Lotlair's horror, when the coats of arms arrived, they were all wrong. As it is widely known, heraldic imagery has to observe the rule of tincture: *metal should not be put on metal, nor colour on colour*. Most of the coats of arms were breaking this rule. Now Lotlair has to send the faulty coats of arms back to the consultancy so that they can be fixed.

But there's so many of them! That's where you come in. Write a program that given a coat of arms prints if it is VALID or INVALID.

Input Specifications

Two integers, N and M, followed by N lines of M characters, representing the coat of arms. $2 < N < 100$, $2 < M < 100$.

Each character represents either a colour or a metal. There are 7 possible characters:

Metals:

O (Or, gold)

A (Argent, silver)

Colours:

a (azure, blue)

g (gules, red)

s (sable, black)

v (vert, green)

p (purpure, purple)

Consider that a colour is put on another colour if these two colours touch and they are **different**.
Assume that the colours don't touch diagonally.
Note that there may be more than one neighbouring block of the same colour/metal e.g. OOOaaa is VALID, but OAaaa or OOaag are INVALID

Output Specifications

Single word, VALID or INVALID.

Sample Input/Output

Input

```
2 2
0a
a0
```

Output

```
VALID
```

Explanation

No two different metals or two different colours are touching.

Input

```
2 2
00
av
```

Output

```
INVALID
```

Explanation

Azure is touching Vert.

Input

```
5 5
vApAv
vApAv
vApAv
vvAvv
vvvvv
```

Output

```
VALID
```

Input

```
5 5
vapav
vapav
vapav
vvavv
```

```
vvvvv
```

Output

```
INVALID
```

Input

```
9 6
aaaaaa
OOOOOO
gggggg
AAAAAA
ssssss
AAAAAA
vvvvvv
OOOOOO
pppppp
```

Output

```
VALID
```