Problem F
Foreign Football

You are on vacation in a foreign country. This country has a local football league, and you don't know any of the team names. However, you have found a table of all the results from this season, and next to every match is the concatenated names of the two teams that played.

There are n teams in total, named $s_1, s_2, \cdots, s_n$. You are given the concatenation $s_i + s_j$ for every ordered pair $i \neq j$. Find the teams names $s_1, s_2, \cdots, s_n$. Team names must be nonempty, but they do not need to be distinct.

Input

The first line of input contains the integer n ($2 \leq n \leq 500$).

The following n lines each contain n strings, the table of concatenated team names. The j:th string on the i:th of these lines will contain the string $s_i + s_j$ if $i \neq j$, and "*" if $i = j$. The concatenated team names will consist of lower case characters a-z.

The total number of characters in concatenated team names is at most 10^6.

Output

If there is no solution, print "NONE".

If there is more than one solution, print "MANY".

If there is one unique solution, print "UNIQUE", followed by n lines containing $s_1, s_2, \cdots, s_n$.

Sample Input 1

```
3
* difaik difhammarby
aikdif * aikhammarby
hammarbydif hammarbyaik *
```

Sample Output 1

```
UNIQUE
dif
aik
hammarby
```

Sample Input 2

```
2
* aaaa
aaaa *
```

Sample Output 2

```
MANY
```

Sample Input 3

```
3
* a ab
a * b
ba b *
```

Sample Output 3

```
NONE
```

Sample Input 4

```
2
* zz
zz *
```

Sample Output 4

```
UNIQUE
z
z
```

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