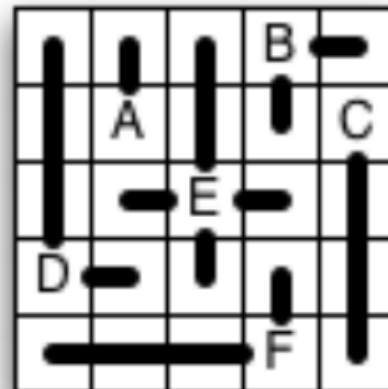


4686 Map Check

Great County Comprehensive Internet Services (GCCIS), a leading local provider of information technology, is planning a new network. Each server will be connected to a certain number of clients which will be located exactly north, south, east, or west of their server. Lines will connect the server to one or more clients located in the same direction away from the server, but may not cross each other or pass through another server or client served by another server; a server may have lines extending into any number of the four directions.

The administration of GCCIS does not believe that its employees are apt enough to produce a correct network map and have turned to you for help. You have been asked to write a program which can validate a map proposal.



Input

Input to your program is a map specification immediately followed by a map proposal consisting of lines with positive integers, single-letter server names, and periods, separated by white space. The sample input below corresponds to the map shown in the image

The first line contains s , the number of servers (≤ 52), followed by r and c , the number of rows and columns in the map grid (each ≤ 25). Rows and columns will be numbered top-down and left-to-right, beginning with one.

Each of the next s lines contains a server name, the row and column number where the server is located in the grid, and the number of clients which the server should be connected to.

The next r lines contain c words each, which form the map proposal. Each word is either a server name to represent a client connected to that server, or a period to represent a server in the location specified earlier, or a minus sign if the location contains neither a server nor a client.

Output

Output from your program should be one line with one of the words 'yes' or 'no', depending on whether the map proposal satisfies the specification or not.

Sample Input

```
6 5 5
A 2 2 1
B 1 4 2
C 2 5 3
D 4 1 4
E 3 3 5
F 5 4 4
D A E . B
D . E B .
D E . E C
```

```
. D E F C  
F F F . C
```

Sample Output

```
yes
```