

Road Network Management

The local transportation authority is managing roads between several cities. They use a map that can be represented as a **road network**. The cities are represented as nodes labeled by values from 1 to n , where n is given as input, and the roads between the cities are represented as edges.

You are tasked with building a program that allows the transportation authority to:

1. **Add a Road:** When a road is built between two cities, the system updates the road map. If a road already exists between the two cities, notify the user with -1. Otherwise, establish the road and update the map.
2. **Display the Road Map:** At any time, the transportation authority can view the current road connections between cities. This is displayed as a matrix where each element in the matrix indicates whether a road exists between two cities.
3. **Check for a Unique Path:** The authority may want to check if a unique path exists between any two specific cities. If exactly one path exists, print "yes", otherwise print "no".

Input Format:

- The first line is an integer n , where n is the number of cities. Initially there are no roads between any of the cities.
- Each subsequent line contains a character from {'a', 'b', 'c', 'g'}, followed by zero or more integers:
- Character 'a' followed by two integers u and v , which represent two cities. Perform the **Add a Road** operation.
- Character 'b' displays the **current road map**.
- Character 'c' followed by two integers u and v , which represent two cities. Perform the **Check for a unique path** operation.
- Character 'g' terminates the program.

Output Format:

- For the "Add a Road" operation, if a road already exists, print -1.
- For the "Display Road Map" operation, print the $n \times n$ adjacency matrix of 0/1 entries.
- For the "Check for a Unique Path" operation, print "yes" (small letters) if exactly one path exists between the cities, otherwise print "no" (small letters).

Constraints:

- $1 \leq n \leq 100$ (Maximum number of cities in the network).
- $1 \leq u, v \leq n$.
- The road network is undirected, meaning if there's a road between city u and city v , then the road is bidirectional.

Sample Test Cases**Input 1:**

```
4
a 1 2
a 2 3
a 3 4
b
c 1 4
a 1 2
g
```

Output 1:

```
0 1 0 0
1 0 1 0
0 1 0 1
0 0 1 0
yes
-1
```

Input 2:

```
6
a 1 2
a 2 3
a 1 4
a 4 3
a 3 5
a 5 6
b
c 1 5
g
```

Output 2:

```
0 1 0 1 0 0
1 0 1 0 0 0
0 1 0 1 1 0
1 0 1 0 0 0
0 0 1 0 0 1
0 0 0 0 1 0
no
```