



Online Judge  
[Web Board](#)  
[Home Page](#)  
[F.A.Qs](#)  
[Statistical Charts](#)

Problem Set  
[Problems](#)  
[Submit Problem](#)  
[Online Status](#)  
Prob.ID:

Authors  
[Register](#)  
[Update your info](#)  
[Authors ranklist](#)

Online Contests  
[Current Contest](#)  
[Past Contests](#)  
[Scheduled Contests](#)  
[Award Contest](#)

User  
User ID:   
Password:   
 [Register](#)

Language:  ▼

## Katu Puzzle

Time Limit: 1000MS

Memory Limit: 65536K

Total Submissions: 11212

Accepted: 4157

## Description

Katu Puzzle is presented as a directed graph  $G(V, E)$  with each edge  $e(a, b)$  labeled by a boolean operator  $op$  (one of AND, OR, XOR) and an integer  $c$  ( $0 \leq c \leq 1$ ). One Katu is solvable if one can find each vertex  $V_i$  a value  $X_i$  ( $0 \leq X_i \leq 1$ ) such that for each edge  $e(a, b)$  labeled by  $op$  and  $c$ , the following formula holds:

$$X_a \text{ op } X_b = c$$

The calculating rules are:

AND	0	1	OR	0	1	XOR	0	1
0	0	0	0	0	1	0	0	1
1	0	1	1	1	1	1	1	0

Given a Katu Puzzle, your task is to determine whether it is solvable.

## Input

The first line contains two integers  $N$  ( $1 \leq N \leq 1000$ ) and  $M$ , ( $0 \leq M \leq 1,000,000$ ) indicating the number of vertices and edges. The following  $M$  lines contain three integers  $a$  ( $0 \leq a < N$ ),  $b$  ( $0 \leq b < N$ ),  $c$  and an operator  $op$  each, describing the edges.

## Output

Output a line containing "YES" or "NO".

## Sample Input

```
4 4
0 1 1 AND
1 2 1 OR
3 2 0 AND
3 0 0 XOR
```

## Sample Output

YES

## Hint

$X_0 = 1, X_1 = 1, X_2 = 0, X_3 = 1$ .

## Source

POJ Founder Monthly Contest – 2008.07.27, Dagger

[\[Submit\]](#) [\[Go Back\]](#) [\[Status\]](#) [\[Discuss\]](#)



[Home Page](#)



[Go Back](#)



[To top](#)

---

All Rights Reserved 2003-2013 Ying Fuchen,Xu Pengcheng,Xie Di  
Any problem, Please [Contact Administrator](#)