Automated Theorem Proving II

Time Limit: 1 Second
Memory Limit: 256 MB

This is what you were asked to do in **Automated Theorem Proving** problem:

Automated Theorem Proving (ATP) is the process of proving theorems with computer programs. You are given n terms and a list of theorems in the form $t_i \to t_j$, where t_i and t_j are in the given set of terms. For each pair of terms (t_i, t_j), find out if we can prove $t_i \to t_j$ with the given theorems.

Now, you want to write a program to verify the correctness of the program you previously wrote. In specific, the input to your new program will be a list of theorems in the form $p \to q$, where p and q statements in the form $x = k$, where x is a boolean variable and $k \in \{true, false\}$. Your goal is to find out if it is possible to assign each variable with a boolean value such that all theorems hold.

Input

The first line of input contains two integers n and m ($1 \leq n, m \leq 10^5$) - number of variables and number of theorems.

The next m lines describe the theorem. Each line is in the following format:

`x`p `=` v_1 `->` `x`q `=` v_2

where $1 \leq p, q \leq n$, $v_1, v_2 \in \{true, false\}$.

Output

Output `YES` if it is possible to assign each variable with a boolean value such that all theorems hold, and `NO` otherwise.

Sample Inputs

```
3 4
x1 = true -> x2 = false
x1 = false -> x3 = true
x2 = false -> x1 = false
x3 = true -> x1 = true
```

Sample Outputs

```
NO
```