Systems of difference constraints P23267_en

Tretzè Concurs de Programació de la UPC - Final (2015-09-16)

A *system of difference constraints* is a set of inequations of the kind $x - y \leq k$, where x and y are integer variables, and k is an integer constant. Given a system of difference constraints, a *solution* is an assignment of values to variables in such a way that all inequations hold.

For instance, the system of difference constraints $\{x_1 - x_2 \leq 4, x_2 - x_3 \leq -1, x_3 - x_1 \leq -2\}$ has, among other solutions, $x_1 = 4$, $x_2 = 0$ and $x_3 = 2$.

Write a program that, given a system of difference constraints with n variables $x_1, \ldots, x_n$ and m inequations among them, tells if there is some solution or not.

Input

Input consists of several cases. Every case begins with n and m, followed m triplets i, j, k, with $i \neq j$, for the inequation $x_i - x_j \leq k$. Assume $1 \leq n \leq 10^3$, $0 \leq m \leq 5n$, $-10^5 \leq k \leq 10^5$, and that every pair of i and j appears at most once. All given numbers are integers.

Output

For every case, print "`yes`" if the system has some solution, and print "`no`" otherwise.

Sample input

```
3 3
1 2 4
2 3 -1
3 1 -2

3 3
1 2 3
2 3 -2
3 1 -2

4 6
2 4 -2
4 2  2
1 2  1
1 4  3
4 3  2
3 1 -1
```

Sample output

```
yes
no
yes
```

Problem information

Author : Enric Rodríguez
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