CSE 221:Algorithm
Assignment (SET A)
Level: Medium

Submission Deadline: December 1st, 2018
Total Marks : 10

[Name of group]
[Name and ID of all group members]

Instructions: A problem is discussed below. You have to a) **Design**, **Explain** and **Simulate** the algorithm to solve the problem **[7]** and b) **Implement** your algorithm to write a java code. Input/output format should be same as described in the problem **[3]**.

Note: Your algorithm should be designed and simulated from the perspective of a computer, not a human being

Question

You have been offered a job as the new road and transportation advisor for Bangladesh. Bangladesh has "n" cities. Between any *2* cities it is possible to have a railway track and a road. Railway tracks are bidirectional, meaning if there exists a railway track between city *u* and city *v* then you can take a train from *u* to *v* as well as from *v* to *u*. Similarly, roads are bidirectional, meaning if there exists a road between city *u* and city *v* then you can drive from *u* to *v* as well as from *v* to *u*.

2 cities, *u* and *v* are called railway-connected if it is possible to travel between *u* and *v* using railway tracks.
2 cities, *u* and *v* are called road-connected if it is possible to travel between *u* and *v* using roads.

The transportation network is called balanced if for all pairs of cities *u*, *v*:
***u*,*v* are both railway-connected and road-connected.**

Initially, there are *n* cities and no roads or railways in Bangladesh's inter city transportation network. You will be given *q* instructions asking you to build either a railway track or a road between *2* cities. After each instruction, you must report whether the transportation network is balanced or not.

Input format

The first line of input will contain *2* integers, *n* and *q*. *q* lines will follow. Each line will contain *3* space-separated integers in one of the following formats:
1 u v : build a railway track between *u* and *v*
2 u v : build a road between *u* and *v*

Output format

You must print *q* lines after each q instructions. The *i*th line contains an answer to the question whether the transport network is balanced after the *i*th instruction. If it is **balanced** print "YES" (without quotes) otherwise print "NO" (without quotes)

Sample Input:	Sample Output:
5 8 1 1 2 1 2 3 2 1 3 2 1 2 1 3 4 2 2 5 1 4 5 2 1 4	NO NO NO YES NO NO NO YES

Explanation of Sample Input/Output:

There are 5 cities and 8 constructing instructions.

After the 1st construction cities 1 and 2 are railway-connected but are not road-connected, so the network is not balanced. Same for 2nd and 3rd construction. After the 4th construction the network is balanced as for all pairs of cities *u*,*v* *u* and *v* are road-connected and railway-connected. After the 5th, 6th and 7th constructions cities 3 and 4 are railway-connected but not road connected. After the 8th construction the network is balanced as for all pairs of cities *u*,*v*; *u* and *v* are road -connected and railway-connected.