Baba and Shortest Paths

Input file:	standard input
Output file:	standard output
Time limit:	2 seconds
Memory limit:	256 megabytes

Baba was too tired trying to come up with problems for the next assignment. He had already made too many problems and was completely out of ideas now. He was asked to create a problem on shortest paths, and he had absolutely no clue. Obviously, searching for ideas on the internet would not help as the students are better in googling and would easily copy solutions. Tired and hopeless, he was wandering on the streets when he the following idea struck him :

Given an undirected weighted graph with N nodes and M edges, and two vertices S and T, for every edge e in the graph, tell the number of shortest paths from S to T passing through e. Since this number can be large, output its value modulo $10^9 + 7$.

He found this problem to be little too hard for assignment, but since he wanted to get away with the work, he had no option but to give it. Hope you will be patient enough while solving it. Good Luck :).

Input

First line contains a single integer t ($1 \leq t \leq 10^5$) denoting the number of test cases.
For every test case, first line contains four space separated integers N M S T ($1 \leq N \leq 2 * 10^5$, $1 \leq M \leq 3 * 10^5$, $1 \leq S, T \leq N$) denoting the number of nodes, number of edges and index of the source and sink vertex in the graph respectively.
Next M lines describe the edges of the graph. Each line contains 3 space separated integers u v w ($1 \leq u, v \leq N$ $1 \leq w \leq 10^9$) denoting that there exists an undirected edge between nodes u and v of weight w.

Output

For every test case, output M space separated integers, where the i'th integer denotes the answer for the i'th edge. Edges are numbered from 1 to M in the order they appear in the input.

Example

standard input	standard output
2 4 6 1 4 3 1 4 3 2 5 3 4 1 4 1 5 1 2 1 2 4 3 4 6 1 4 4 1 3 1 2 4 4 3 1 1 3 1 3 2 4 2 4 2	0 0 0 0 1 1 0 0 1 1 0 0

Note

Sum of N over all test cases $\leq 5 * 10^5$.
Sum of M over all test cases $\leq 10^6$.

Since the problem requires large I/O, use scanf/printf instead of cin/cout in case of c++.