Shipping Plan

Problem Description

In 2044 AD, humanity entered the cosmic epoch.

There are n planets in country L and n-1 two-way routes, each of which is established between two planets. These n-1 routes connect all the planets in L.

P is in charge of a logistics company. The company has many shipping plans. Each shipping plan is like this: there is a logistics ship that needs to fly from planet U_i to planet V_i along the fastest space path. Obviously, it takes time for a ship to travel through a route. For route j, it takes t_j time for any ship to travel through it, and there is no interference between any two ships.

To encourage scientific and technological innovation, the king of country L agrees to allow P's logistics company to participate in the route construction of country L, that is, allow P to transform a route into a wormhole, and the spaceship will pass through the wormhole without consuming time.

Before the completion of the wormhole construction, P's logistics company pre-connected M transportation plans. After the construction of the wormhole is completed, these m shipping plans will start at the same time, and all ships will depart together. When all the M shipping plans are completed, the stage work of P's logistics company will be completed.

If P is free to choose which channel to transform into a wormhole, try to find out what is the shortest time it takes for P's logistics company to complete the phased work.

Input

The first line includes two positive integers n and m, representing the number of planets in country L and the number of shipping plans pre-connected by small P. The planets are numbered from 1 to n.

The next n-1 lines describe the construction of the routes, where line i contains three integers a_i, b_i, and t_i, which means that the two-way route i is built between the two planets a_i and b_i, and it takes t_i time for any spacecraft to pass through it.

The next M lines describe the situation of the shipping plan, where the j^{th} line contains two positive integers u_j and v_j, indicating that the j^{th} shipping plan is to fly from planet u_j to planet v_j.

Output

There is an integer representing the minimum time it takes for P's logistics company to complete the stage work.

Sample Input

6 3
1 2 3
1 6 4
3 1 7
4 3 6
3 5 5
3 6
2 5
4 5

Sample Output

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Data Range

The range and characteristics of all test data are shown in the table below:

Test Point	n=	m=	Constraints
1	100	1	
2		100	The ith route connects ith planet and i+1th planet
3			
4	2000	1	
5	1000	1000	The ith route connects ith planet and i+1th planet
6	2000	2000	
7	3000	3000	
8	1000	1000	
9	2000	2000	
10	3000	3000	
11	80000	1	
12	100000		
13	70000	70000	The ith route connects ith planet and i+1th planet
14	80000	80000	
15	90000	90000	
16	100000	100000	
17	80000	80000	
18	90000	90000	
19	100000	100000	
20	300000	300000	
All data			$1 \le a_i, b_i, u_j, v_j \le n, 0 \le t_i \le 1000$

Be aware of the constant factor effect on program efficiency.

For 100% of the data, guarantee: $1 \le a_i, b_i \le n$, $0 \le t_i \le 1000$, $1 \le u_i, v_i \le n$.