Vertical Paths

HackerRank

You have a rooted tree with n vertices numbered from 1 through n where the root is vertex 1.

You are given m triplets, the j^{th} triplet is denoted by three integers u_j, v_j, c_j. The j^{th} triplet represents a simple path in the tree with endpoints in u_i and v_i such that u_j is ancestor of v_j. The cost of the path is c_j.

You have to select a subset of the paths such that the sum of path costs is maximum and the i^{th} edge of the tree belongs to at most d_i paths from the subset. Print the sum as the output.

Input Format

The first line contains a single integer, T, denoting the number of testcases. Each testcase is defined as follows:

- The first line contains two space-separated integers, n (the number of vertices) and m (the number of paths), respectively.
- Each line i of the $n-1$ subsequent lines contains three space-separated integers describing the respective values of a_i, b_i, and d_i where (a_i, b_i) is an edge in the tree and d_i is maximum number of paths which can include this edge.
- Each line of the m subsequent lines contains three space-separated integers describing the respective values of u_j, v_j, and c_j ($u_j \neq v_j$) that define the j^{th} path and its cost.

Constraints

- Let M be the sum of m over all the trees.
- Let D be the sum of $n \times m$ over all the trees.
- $1 \leq T \leq 10^3$
- $1 \leq M, m \leq 10^3$
- $1 \leq D, n \leq 5 \times 10^5$
- $1 \leq c_i \leq 10^9$
- $1 \leq d_j \leq m$

Output Format

You must print T lines, where each line contains a single integer denoting the answer for the corresponding testcase.

Sample Input

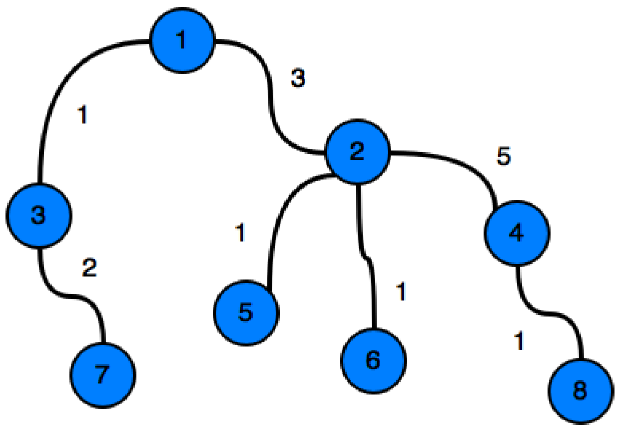
```
1
8 8
1 2 3
```

```
1 3 1
2 4 5
2 5 1
2 6 1
3 7 2
4 8 1
1 2 3
2 8 5
1 8 7
1 5 8
1 6 10
3 7 5
1 7 6
1 7 6
```

Sample Output

```
37
```

Explanation



One of the possible subsets contains paths $1, 2, 4, 5, 6, 7$. Its total cost is $3 + 5 + 8 + 10 + 5 + 6 = 37$.