

Problem C. Cyclic Distance

Input file: *standard input*
Output file: *standard output*
Time limit: 3 seconds
Memory limit: 512 mebibytes

The trick from problem “Alien” is a great way to improve a naive $O(nk)$ dynamic programming to $O(n \log n)$. More problems with this trick can make the contest better, like the two unsolved problems in 300iq Contest 2.

You are given a weighted tree with n vertices and $n - 1$ edges. The i -th edge connects vertices u_i and v_i and has length l_i . Let $\text{dis}(u, v)$ be the distance (sum of weights on simple path) between vertex u and vertex v in the tree.

Find k distinct vertices p_1, p_2, \dots, p_k that maximize $\sum_{i=1}^k \text{dis}(p_i, p_{i \bmod k+1})$. Output the maximum sum.

Input

The first line contains an integer T ($1 \leq T \leq 10^5$) indicating the number of test cases. For each test case:

The first line contains two integers n, k ($2 \leq n \leq 2 \cdot 10^5, 2 \leq k \leq n$).

Each of the following $n - 1$ lines contains three integers u_i, v_i, l_i ($1 \leq u_i, v_i \leq n, 1 \leq l_i \leq 10^6$).

It is guaranteed that $\sum n \leq 2 \cdot 10^5$.

Output

For each test case, output one line with one integer: the answer.

Example

standard input	standard output
1 5 3 1 2 4 1 3 1 1 4 8 4 5 9	44