Problem B. Best Meeting Places

Input file:	*standard input*
Output file:	*standard output*
Time limit:	3 seconds
Memory limit:	1024 mebibytes

A tree with N vertices is given. Vertices are numbered sequentially from 1 to N. The i-th edge connects vertices A_i and B_i, and has weight C_i, for $1 \le i \le N - 1$.

The *teleport distance* between two vertices of the tree is the maximum weight of the edge on the shortest path connecting them. The teleport distance between a vertex and itself is defined as 0.

People living on the tree want to hold N meetings. The i-th meeting is attended by people living in the vertices numbered from 1 to i. This year, because of the spread of coronavirus, the meeting participants will arrive at X selected locations, and then connect via Internet from these locations.

More formally, for each meeting, we will choose X pairwise distinct vertices v_1, v_2, ..., v_X. Once the vertices are determined, each person will move to one of the vertices v_1, ..., v_X with the minimum teleport distance to it. Let us define the *meeting cost* for the given X and i as the maximum of teleport distances for meeting participants. We will select the vertices v_1, ..., v_X in such a way that the meeting cost is minimal possible.

The value of X depends on the coronavirus situation, and may vary from 1 to K. To prepare for the meeting in advance, write a program that, for each of the N meetings, finds the sum of the meeting costs for all possible values of X from 1 to K, inclusive.

Input

The first line of input contains two integers N and K: the number of vertices and the upper limit for X, respectively ($1 \le K \le N \le 3 \cdot 10^5$).

The following $N - 1$ lines describe the tree. Each of these lines contains three integers, A_i, B_i, and C_i, telling that there is an edge between vertices A_i and B_i with weight C_i ($1 \le A_i, B_i, C_i \le N$). It is guaranteed that the resulting graph is a tree.

Output

Print N lines. On line i, print the sum of meeting costs of i-th meeting for all X from 1 to K, inclusive.

Examples

standard input	standard output
10 4 5 1 2 1 6 4 6 2 1 2 8 9 8 3 5 3 4 8 4 10 9 10 9 8 9 7 7	0 4 13 21 23 23 30 31 33 34
8 3 7 3 4 4 5 2 3 6 1 6 8 6 8 5 1 2 5 8 1 5 2	0 8 14 16 16 16 18 18