Halcyon

Input file:	`standard input`
Output file:	`standard output`
Time limit:	10 seconds
Memory limit:	1024 megabytes

Minseok and Martin have two weighted trees T_1, T_2. They share the same vertex set of size n, where we index each vertex with integers from $1, 2, \ldots, n$.

For a given k, Minseok selects k edges from T_1, and Martin selects $n-1-k$ edges from T_2. The union of their selected edges should form a tree. If this is possible, they should minimize the total weight of selected edges.

Input

In the first line, a single integer N denoting the number of vertices in both trees is given.

In the next $N-1$ lines, description of the first tree is given. Each of the $N-1$ lines contains three integers S_i, E_i, W_i, which indicates there is an edge connecting two vertices S_i, E_i with weight W_i.

In the next $N-1$ lines, description of the second tree is given in the same format.

Output

For all $0 \leq k \leq n-1$, print the minimum total weight, or print -1 if it is impossible.

Scoring

- $2 \leq N \leq 250\,000$
- $1 \leq S_i, E_i \leq N, 1 \leq W_i \leq 10^9$ $(1 \leq i \leq N-1)$

Examples

standard input	standard output
5 1 2 10 2 4 20 3 4 30 4 5 50 1 2 15 1 3 25 1 4 35 1 5 25	100 85 80 85 110
9 5 7 6577 4 5 8869 5 9 9088 2 1 124 6 2 410 2 8 8154 4 8 4810 3 4 4268 3 9 763 6 2 8959 7 4 7984 3 8 504 8 6 9085 5 2 4861 1 9 8539 1 7 7834	48529 39568 31019 26748 25491 25661 29669 33975 42300