

# housevisit

Time Limit: 1 second  
Memory Limit: 128 MB

## Problem Description

Whiterabbit is going out to visit his relatives in his hometown after slacking at home for one whole month. His hometown can be represented by a graph, with  $N$  houses and  $N - 1$  roads between houses. He can vouch that between every 2 houses in his hometown, there is a unique path from one house to the other without crossing a road more than once. The  $i^{\text{th}}$  road connects houses  $A_i$  and  $B_i$  and takes Whiterabbit  $T_i$  seconds to traverse. Whiterabbit's house is always house 1, and his  $N - 1$  relatives live at houses 2 to  $N$ .

In order to visit his relative at house  $X$ , Whiterabbit must travel to house  $X$  using only the roads in the town. If he wishes to visit any relatives along the way, he can. Note that visiting a house does not take any time at all, meaning that once Whiterabbit arrives at a house, he can move on the visit other houses instantly. At the end of the day, Whiterabbit has to return home for reunion dinner, and thus his travels must eventually bring him home. Whiterabbit has yet to decide how many relatives he wants to visit, and thus wants to calculate how much time it would take him to visit some number of relatives.

However, as Whiterabbit ~~is lazy and wants to sleep at home~~ would like to visit as many relatives as possible and return home in time for dinner, he wants to know for each positive integer  $X$  between 1 and  $N - 1$  inclusive, the minimum amount of time needed to visit  $X$  different relatives and return home. The order of which he visits the relatives and the exact houses he visits doesn't matter, just the time needed to visit all  $X$  houses.

## Input Format

The input format is as follows:

- The first line of input contains 1 integer  $N$ .
- The next  $N - 1$  lines of input contain 3 spaced integers each, the  $i^{\text{th}}$  line containing  $A_i$ ,  $B_i$  and  $T_i$ .

## Output Format

The output format is as follows:

- Output  $N - 1$  lines of output with 1 integer on each line, the  $i^{\text{th}}$  indicating the minimum number of seconds needed to visit  $i$  houses and return home.

## Subtasks

Subtask	Score	$N$	Additional Constraints
1	8	$2 \leq N \leq 3$	
2	11	$2 \leq N \leq 500$	$T_i = 1$
3	14	$2 \leq N \leq 500$	$A_i = 1$
4	15	$2 \leq N \leq 20$	
5	17	$2 \leq N \leq 500$	$A_{i+1} = B_i$ for all $1 \leq i < N - 1$
6	16	$2 \leq N \leq 80$	
7	19	$2 \leq N \leq 500$	
8	0	Sample Testcases	
For all subtasks: $2 \leq N \leq 500, 1 \leq A_i, B_i \leq N, A_i \neq B_i, 1 \leq T_i \leq 10^9$			

## Examples

standard input	standard output
3 1 2 5 1 3 4	8 18
6 5 2 5 2 1 1 1 3 2 3 6 3 6 4 10	2 6 12 22 42
8 1 2 3 3 4 3 7 6 3 5 1 3 8 3 3 4 2 3 6 8 3	6 12 18 24 30 36 42
5 4 2 601431952 3 4 601431952 5 4 601431943 1 3 601431947	1202863894 2405727798 3608591684 4811455588