

You are given a rooted [tree](#) with  $N$  nodes and the root of the tree,  $R$ , is also given. Each node of the tree contains a value, that is initially empty. You have to maintain the tree under two operations:

1. Update Operation
2. Report Operation

### Update Operation

Each Update Operation begins with the character  $u$ . Character  $u$  is followed by 3 integers  $T$ ,  $V$  and  $K$ . For every node which is the descendent of the node  $T$ , update it's value by adding  $V + d * K$ , where  $V$  and  $K$  are the parameters of the query and  $d$  is the distance of the node from  $T$ . Note that  $V$  is added to node  $T$ .

### Report Operation

Each Report Operation begins with the character  $q$ . Character  $q$  is followed by 2 integers,  $A$  and  $B$ . Output the sum of values of nodes in the path from  $A$  to  $B$  modulo  $(10^9 + 7)$

### Input Format

The first Line consists of 3 space separated integers,  $N E R$ , where  $N$  is the number of nodes present,  $E$  is the total number of queries (update + report), and  $R$  is root of the tree.

Each of the next  $N-1$  lines contains 2 space separated integers,  $X$  and  $Y$  ( $X$  and  $Y$  are connected by an edge).

Thereafter,  $E$  lines follows: each line can represent either the Update Operation or the Report Operation.

- *Update Operation* is of the form :  $U T V K$ .
- *Report Operation* is of the form :  $Q A B$ .

### Output Format

Output the answer for every given report operation.

### Constraints

$1 \leq N, E \leq 10^5$   
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 $1 \leq R, X, Y, T, A, B \leq N$   
 $1 \leq V, K \leq 10^9$   
 $X \neq Y$

### Sample Input

```
7 7 1
1 2
2 3
2 4
2 5
5 6
6 7
U 5 10 2
U 4 5 3
Q 1 7
U 6 7 4
Q 2 7
Q 1 4
Q 2 4
```

### Sample Output

```
36
54
5
5
```

### Explanation

- Values of Nodes after  $U 5 10 2$ :  $[0 \ 0 \ 0 \ 0 \ 10 \ 12 \ 14]$ .

- Values of Nodes after  $u\ 4\ 5\ 3$ :  $[0\ 0\ 0\ 5\ 10\ 12\ 14]$ .
- Sum of the Nodes from 1 to 7:  $0 + 0 + 10 + 12 + 14 = 36$ .
- Values of Nodes after  $u\ 6\ 7\ 4$ :  $[0\ 0\ 0\ 5\ 10\ 19\ 25]$ .
- Sum of the Nodes from 2 to 7:  $0 + 10 + 19 + 25 = 54$ .
- Sum of the Nodes from 1 to 4:  $0 + 0 + 5 = 5$ .
- Sum of the Nodes from 2 to 4:  $0 + 5 = 5$ .