Rooted Tree

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 mantain 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

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

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.