Queries on a Binary Tree

Problem code: BINTREEQ

All submissions for this problem are available.

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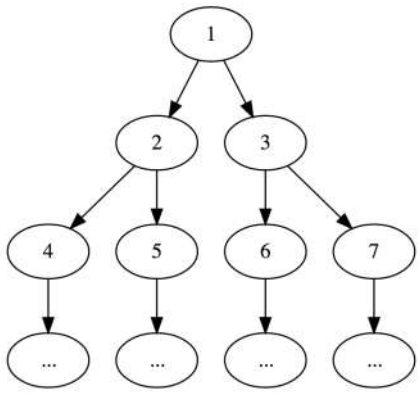
Read problems statements in Mandarin Chinese, Russian and Vietnamese as well.

Let's consider a rooted binary tree with the following properties:

- The number of nodes and edges in the tree is infinite
- The tree root is labeled by **1**
- A node labeled by **v** has two children: **2 × v** (the left son of **v**) and **2 × v + 1** (the right son of **v**)

Here is an image of the first several tree layers of such a tree:



Let's consider four operations, that are allowed to apply during the tree traversal:

- **move to the left son -** move from **v** to **2 × v**
- **move to the right son -** move from **v** to **2 × v + 1**
- **move to the parent as a left son -** move from **v** to **v / 2** if **v** is an even integer
- **move to the parent as a right son -** move from **v** to **(v - 1) / 2** if **v** is an odd integer

It can be proven, that for any pair of two nodes **u** and **v**, there is only one sequence of such commands, that moves from **u** to **v** and visits each node of the tree at most once. Let's call such a sequence of commands a *path configuration* for a pair of nodes (**u**, **v**).
You are asked to process a series of the following queries:
You are given three integers **n**, **u** and **v** (**1 ≤ u, v ≤ n**). Count the pairs of nodes (**w, t**) (**1 ≤ w, t ≤ n**) such that the path configuration for (**w, t**) is the same with the path configuration for (**u, v**).

Input

The first line of input contains an integer **Q** denoting the number of queries to process.
Each of the next **Q** lines contains three space-separated integers **n**, **u** and **v** denoting a query.

Output

For each query, print the answer on a separate line.

Constraints

- **1 ≤ Q ≤ 20000**
- **1 ≤ u, v ≤ n ≤ 10^9**

Example

Input:
3
11 9 11
10 2 2
8 1 8

Output:

Output:
2
10
1

Explanation

In the first query from the example test case, you should count pairs (**5, 7**) and (**9, 11**).
In the second query from the example test case, you should count the following pairs: (**1, 1**), (**2, 2**), (**3, 3**), (**4, 4**), (**5, 5**), (**6, 6**), (**7, 7**), (**8, 8**), (**9, 9**) and (**10, 10**).
In the third query from the example test case, you should only count a pair (**1, 8**).

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