Medium

Table: Tree

```
+-------------+------+
| Column Name | Type |
+-------------+------+
| id          | int  |
| p_id        | int  |
+-------------+------+
```

id is the column with unique values for this table.
Each row of this table contains information about the id of a node and the id of its parent node in a tree.
The given structure is always a valid tree.

Each node in the tree can be one of three types:

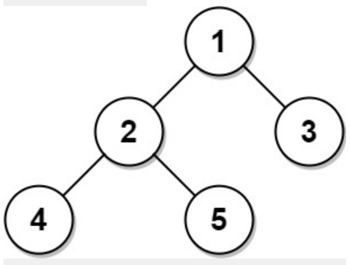
- **"Leaf"**: if the node is a leaf node.
- **"Root"**: if the node is the root of the tree.
- **"Inner"**: If the node is neither a leaf node nor a root node.

Write a solution to report the type of each node in the tree.

Return the result table in **any order**.

The result format is in the following example.

Example 1:

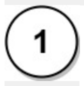


Input:
Tree table:

```
+----+------+
| id | p_id |
+----+------+
| 1  | null |
| 2  | 1    |
| 3  | 1    |
| 4  | 2    |
| 5  | 2    |
+----+------+
```

Output:

```
+----+-------+
| id | type  |
+----+-------+
| 1  | Root  |
| 2  | Inner |
| 3  | Leaf  |
| 4  | Leaf  |
| 5  | Leaf  |
+----+-------+
```
Explanation:
Node 1 is the root node because its parent node is null and it has child nodes 2 and 3.
Node 2 is an inner node because it has parent node 1 and child node 4 and 5.
Nodes 3, 4, and 5 are leaf nodes because they have parent nodes and they do not have child nodes.
Example 2:



Input:
Tree table:
```
+----+------+
| id | p_id |
+----+------+
| 1  | null |
+----+------+
```
Output:
```
+----+-------+
| id | type  |
+----+-------+
| 1  | Root  |
+----+-------+
```
Explanation: If there is only one node on the tree, you only need to output its root attributes.

```
# Write your MySQL query statement below
-- SELECT id,CASE
--          WHEN p_id IS NULL THEN 'Root'
--          WHEN id IN (SELECT DISTINCT p_id
--                      FROM TREE
--                      WHERE p_id NOT IN (SELECT id  -- NOT REQUIRED SINCE ROOT WILL NEVER
COME DOWN TO CASE 2
--                                         FROM TREE
--                                         WHERE p_id IS NULL))
--          THEN 'Inner'
--          ELSE 'Leaf'
--       END AS type
-- FROM Tree

SELECT id, CASE
     WHEN p_id IS NULL THEN 'Root'
     WHEN id IN (SELECT DISTINCT p_id FROM Tree) THEN 'Inner'
     ELSE 'Leaf'
     END as type
FROM Tree
```