

Binary Tree Nodes



You are given a table, *BST*, containing two columns: *N* and *P*, where *N* represents the value of a node in *Binary Tree*, and *P* is the parent of *N*.

Column	Type
<i>N</i>	<i>Integer</i>
<i>P</i>	<i>Integer</i>

Write a query to find the node type of *Binary Tree* ordered by the value of the node. Output one of the following for each node:

- *Root*: If node is root node.
- *Leaf*: If node is leaf node.
- *Inner*: If node is neither root nor leaf node.

Sample Input

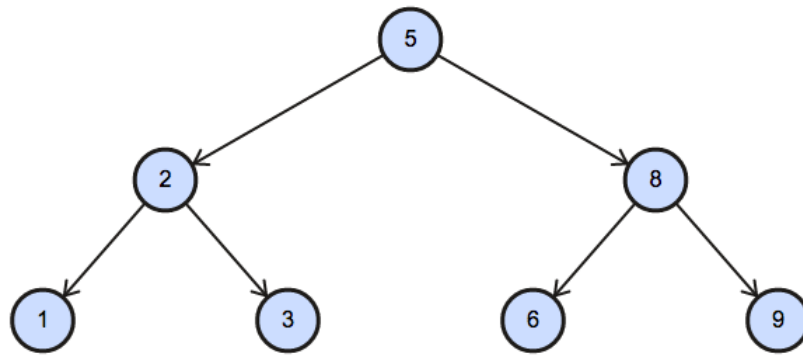
<i>N</i>	<i>P</i>
1	2
3	2
6	8
9	8
2	5
8	5
5	<i>null</i>

Sample Output

```
1 Leaf
2 Inner
3 Leaf
5 Root
6 Leaf
8 Inner
9 Leaf
```

Explanation

The *Binary Tree* below illustrates the sample:



```
SELECT
  CASE
    WHEN P IS NULL
      THEN CONCAT(N, ' Root')
    WHEN N IN
      (
        SELECT DISTINCT
          P
        FROM
          BST
      )
      THEN CONCAT(N, ' Inner')
      ELSE CONCAT(N, ' Leaf')
    END
FROM
  BST
ORDER BY
  N ASC
```