LCA Pairs

You are given a connected tree of **N** nodes numbered from **0** to **N-1** rooted at the **0th** node, where **p[i]** is the parent of **the ith** node and **p[0] = -1** as the 0th node is the root.

Calculate the numbers of pairs of nodes (a,b) $0 \le a < N$, $a \le b < N$ such that LCA(a,b) = x , for each x where $0 \le x < N$.

The LCA or lowest common ancestor between two nodes a and b is defined as the lowest node in tree that has both a and b as descendants (where we allow a node to be a descendant of itself).

Example 1:

```
Input:
N = 3
p[] = [-1, 0, 0]
Output: [4, 1 , 1]
Explanation: The structure of tree is :
   0
  / \
 1   2
For LCA = 0, we have 4 pairs (0,0), (0,1),
(0,2), (1,2)
For LCA = 1, we have only 1 pair (1,1)
For LCA = 2, we have only 1 pair (2,2)
```

Example 2:

```
Input:
N = 5
p[] = [-1, 0, 0, 1, 1]
Output: [8, 4, 1, 1, 1]
```

```
Explanation: The structure of tree is :
      0
     / \
    1   2
   / \
  3   4
For LCA = 0, we have 8 pairs (0,0), (0,1),
(0,2),(0,3),(0,4),(1,2),(2,3),(2,4)
For LCA = 1 , we have 4 pairs (1,1), (1,3),
(1,4),(3,4)
FOR LCA = 2, we have only 1 pair (2,2),
FOR LCA = 3, we have only 1 pair (3,3)
For LCA = 4, we have only 1 pair (4,4)
```

Your Task:

Your task is to complete the function **calcPairs()** which takes the integer **N** and a list **p[ ]** of size **N** as input parameters and returns a list of **N** elements a_0, a_1, .. a_{N-1} where a_i is the the number of unordered pairs for which lca(a,b) = i , where $0 \le a < N$, $a \le b < N$

Constraints:

$1 \le N \le 10^5$

$0 \le p[i] < N$ where $0 < i < N$

p[0]=-1