1120. Maximum Average Subtree Premium

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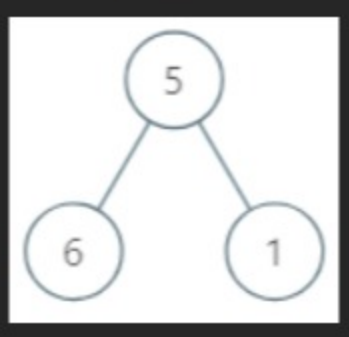
Given the `root` of a binary tree, return *the maximum **average** value of a **subtree** of that tree*. Answers within `10^-5` of the actual answer will be accepted.

A **subtree** of a tree is any node of that tree plus all its descendants.

The **average** value of a tree is the sum of its values, divided by the number of nodes.

Example 1:




```
Input: root = [5,6,1]
Output: 6.00000
Explanation:
For the node with value = 5 we have an average of (5 + 6 + 1) / 3 = 4.
For the node with value = 6 we have an average of 6 / 1 = 6.
For the node with value = 1 we have an average of 1 / 1 = 1.
So the answer is 6 which is the maximum.
```

Example 2:

```
Input: root = [0,null,1]
Output: 1.00000
```

Constraints:

- The number of nodes in the tree is in the range `[1, 10^4]`.
- `0 <= Node.val <= 10^5`

Seen this question in a real interview before? 1/5

Yes No

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Hint 1

Can you find the sum of values and the number of nodes for every sub-tree ?

Hint 2

Can you find the sum of values and the number of nodes for a sub-tree given the sum of values and the number of nodes of it's left and right sub-trees ?

Hint 3

Use depth first search to recursively find the solution for the children of a node then use their solutions to compute the current node's solution.

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