Problem 109: Convert Sorted List to Binary Search Tree

Problem Information

Difficulty: Medium
Acceptance Rate: 65.48%
Paid Only: No
Tags: Linked List, Divide and Conquer, Tree, Binary Search Tree, Binary Tree

Problem Description

Given the `head` of a singly linked list where elements are sorted in **ascending order** , convert _it to a_** _height-balanced_** _binary search tree_.

Example 1:

![](https://assets.leetcode.com/uploads/2020/08/17/linked.jpg)

Input: head = [-10,-3,0,5,9] **Output:** [0,-3,9,-10,null,5] **Explanation:** One possible answer is [0,-3,9,-10,null,5], which represents the shown height balanced BST.

Example 2:

Input: head = [] **Output:** []

Constraints:

* The number of nodes in `head` is in the range `[0, 2 * 104]`. * `-105 <= Node.val <= 105`

Code Snippets

C++:

```
/**
* Definition for singly-linked list.
* struct ListNode {
* int val;
* ListNode *next;
* ListNode() : val(0), next(nullptr) {}
* ListNode(int x) : val(x), next(nullptr) {}
* ListNode(int x, ListNode *next) : val(x), next(next) {}
* };
*/
/**
* Definition for a binary tree node.
* struct TreeNode {
* int val;
* TreeNode *left;
* TreeNode *right;
* TreeNode() : val(0), left(nullptr), right(nullptr) {}
* TreeNode(int x) : val(x), left(nullptr), right(nullptr) {}
* TreeNode(int x, TreeNode *left, TreeNode *right) : val(x), left(left), right(right) {}
* };
*/
class Solution {
public:
TreeNode* sortedListToBST(ListNode* head) {

}
};
```

Java:

```
/**
* Definition for singly-linked list.
* public class ListNode {
* int val;
* ListNode next;
* ListNode() {}
* ListNode(int val) { this.val = val; }
* ListNode(int val, ListNode next) { this.val = val; this.next = next; }
* }
*/
/**
* Definition for a binary tree node.
* public class TreeNode {
* int val;
* TreeNode left;
* TreeNode right;
* TreeNode() {}
* TreeNode(int val) { this.val = val; }
* TreeNode(int val, TreeNode left, TreeNode right) {
* this.val = val;
* this.left = left;
* this.right = right;
* }
* }
*/
class Solution {
public TreeNode sortedListToBST(ListNode head) {

}
}
```

Python3:

```
# Definition for singly-linked list.
# class ListNode:
# def __init__(self, val=0, next=None):
# self.val = val
# self.next = next
# Definition for a binary tree node.
# class TreeNode:
# def __init__(self, val=0, left=None, right=None):
# self.val = val
# self.left = left
# self.right = right
class Solution:
def sortedListToBST(self, head: Optional[ListNode]) -> Optional[TreeNode]:
```