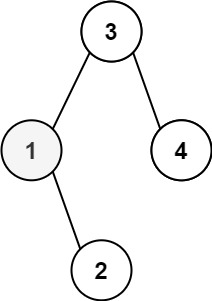
**Kth Smallest Element in a BST**

<https://leetcode.com/problems/kth-smallest-element-in-a-bst/>

Given the root of a binary search tree, and an integer k, return *the* kth *smallest value (****1-indexed****) of all the values of the nodes in the tree*.

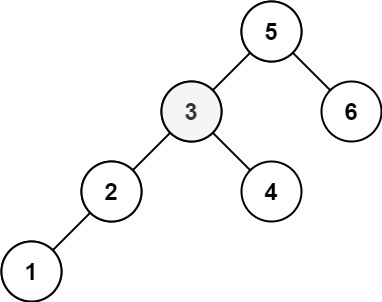
**Example 1:**



**Input:** root = [3,1,4,null,2], k = 1

**Output:** 1

**Example 2:**



**Input:** root = [5,3,6,2,4,null,null,1], k = 3

**Output:** 3

**Constraints:**

* The number of nodes in the tree is n.
* 1 <= k <= n <= 104
* 0 <= Node.val <= 104

**Follow up:** If the BST is modified often (i.e., we can do insert and delete operations) and you need to find the kth smallest frequently, how would you optimize?