<https://leetcode.com/explore/challenge/card/may-leetcoding-challenge/536/week-3-may-15th-may-21st/3335/>

Given a binary search tree, write a function kthSmallest to find the **k**th smallest element in it.

**Example 1:**

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

3

/ \

1 4

\

  2

**Output:** 1

**Example 2:**

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

5

/ \

3 6

/ \

2 4

/

1

**Output:** 3

**Follow up:**  
What if the BST is modified (insert/delete operations) often and you need to find the kth smallest frequently? How would you optimize the kthSmallest routine?

**Constraints:**

* The number of elements of the BST is between 1 to 10^4.
* You may assume k is always valid, 1 ≤ k ≤ BST's total elements.