



Assignment Solutions | Binary Search Tree 1 | Week 18

1. Find the nodes with minimum and maximum value in a Binary Search Tree.

```
void maxAndmin(TreeNode* root) {
    int mn = root->val, mx = root->val;
    TreeNode* temp = root;
    while(temp->left) {
        temp = temp->left;
        mn = temp->val;
    }
    while(root->right) {
        root = root->right;
        mx = root->val;
    }
    cout << mn << " " << mx << "\n";
}
```

2. kth Smallest element in a BST [Leetcode 230]

```
class Solution {
public:
    // bst ka inorder sorted hota hai, use that property
    int k, ans = -1;
    void helper(TreeNode* root) {
        if(!root) return;
        helper(root->left);
        k--;
        if(k == 0) ans = root->val;
        helper(root->right);
    }
    int kthSmallest(TreeNode* root, int k) {
        this->k = k;
        helper(root);
        return ans;
    }
};
```

3. Given the root of a binary search tree, return a balanced BST with the same node values.
[Leetcode 1382]

```

class Solution {
public:
    void inorder(TreeNode* root, vector<TreeNode*> &v){
        if(root==NULL) return;
        if(root->left) inorder(root->left,v);
        v.push_back(root);
        if(root->right) inorder(root->right,v);
    }
    TreeNode* solve(int low,int high,vector<TreeNode*> &v){
        if(low>high)
            return NULL;
        int m=(low+high)/2;
        v[m]->left=solve(low,m-1,v);
        v[m]->right=solve(m+1,high,v);
        return v[m];
    }
    TreeNode* balanceBST(TreeNode* root) {
        vector<TreeNode*> v;
        inorder(root,v);
        return solve(0,v.size()-1,v);
    }
};

```

4. Given the root node of a binary search tree and two integers low and high, return the sum of values of all nodes with a value in the inclusive range [low, high].

[Leetcode 938]

```

class Solution {
public:
    // just use property that inorder is sorted
    int ans = 0;
    void helper(TreeNode* root, int l, int r) {
        if(!root) return;
        helper(root->left, l, r);
        if(l <= root->val && root->val <= r) ans += root->val;
        helper(root->right, l, r);
    }
    int rangeSumBST(TreeNode* root, int low, int high) {
        helper(root, low, high);
        return ans;
    }
};

```

Note:- Please try to invest time doing the assignments which are necessary to build a strong foundation. Do not directly Copy Paste using Google or ChatGPT. Please use your brain 😊.
