Practice Question 1

Given a Binary Search Tree (BST) that stores country names as keys and their GDP (in billions) as values. Write the steps and pseudo-code for a method that takes the root node of the BST as input and prints the top K countries by GDP in descending order. Assume that K=7. The time complexity of your solution must be O(K).

Solution for Practice Question 1

Steps to Solve:

- **o** **Perform a reverse in-order traversal of the BST. This traversal visits nodes in descending order (right, root, left).**
- **o** **Keep a counter to ensure exactly KKK nodes are processed.**
- **o** **Stop the traversal once KKK nodes have been printed.**

Pseudo-Code:

```
void printTopKCountries(TreeNode* root, int K) {

    static int count = 0; // Counter for visited nodes

    if (root == nullptr || count >= K)

        return;


    // Traverse the right subtree first (descending order)

    printTopKCountries(root->right, K);


    // Process the current node

    if (count < K) {
```

```
        cout << root->key << " - GDP: " << root->value << endl;

        count++;

    }



    // Traverse the left subtree

    printTopKCountries(root->left, K);

}
```

Time Complexity Analysis:

- The reverse in-order traversal will stop early once K nodes are visited, so the time complexity is O(K).

Practice Question 2

Given a Binary Search Tree (BST) that stores book titles as keys and their sales (in millions) as values. Write the steps and pseudo-code for a method that takes the root node of the BST as input and prints the K=9 best-selling books in descending order of sales. Ensure the time complexity is O(K).

Practice Question 3

Given a Binary Search Tree (BST) that stores university names as keys and their global rankings as values. Write the steps and pseudo-code for a method that takes the root node of the BST as input and prints the K=6 highest-ranked universities (smallest rank values) in ascending order. Ensure the time complexity is O(K).