Betülnaz HAYRAN – 28354853660 Cansu GÜREL – 16157401836 Batuhan KESİKBAŞ – 40573251614

BIM213-Data Structures and Algorithms

homework-3

Homework 3

**How did we solve it?**

In AVL class, first of all, we added height method which gives us the height of the tree. Then, we have a ‘checkBalanceAndRotate’ method that checks the balances of nodes and rotates if the tree is not balanced.

After that, we have two methods for rotations that are ‘leftRotation’ and ‘rightRotation’ for ‘checkBalanceAndRotate’ method and this method uses these methods to balance the tree with rotations.

In ‘Insert’ method we invoke ‘insert’ method, in invoked method we insert nodes with their key and invoke ‘checkBalanceAndRotate’ method to balance the tree after insertion. Moreover, we updated noOfNodes and count variable.

Then, we have a ‘getBalance’ method which gets the balance factor of nodes and we use this method in ‘checkBalanceAndRotate’ method.

In ‘Delete’ method we invoke ‘delete’ method and returns 0 if deletion succeeds, -1 if it fails. Invoked method deletes the node and its key. Moreover, we updated noOfNodes and count variable. Then, it invokes ‘checkBalanceAndRotate’ method to balance the tree after deletion.

In our ‘maxValueNode’ method, it finds the maximum value on the right sub tree and we use this method in delete method.

In ‘updateCountForSameKeys’ method, when we change count of a node, this method updates the count of nodes that has the same key.

‘Find’ method searches the AVL for a key and returns a pointer to the node that contains the key (if found) or NULL if unsuccessful.

‘Min’ method returns a pointer to the node that contains the minimum key.

‘Max’ method returns a pointer to the node that contains the maximum key.

‘Depth’ method invokes ‘maxDepth’ method. Invoked method returns the depth of the deepest leaf node.

‘Print’ method invokes ‘inOrder’ method. Invoked method performs an inorder traversal of the tree and prints [key, count] pairs in sorted order.

**Which environment did we used?**

We used JetBrains- IntelliJ environment for our project.