Indian Institute of Technology Mandi
February-June 2015 Semester

CS202: Advanced Data Structure and Algorithms

Programming Assignment 5

Last date of submission: 18th April, 2016 – 10:00 PM

Implement the Dictionary data structure using binary search tree (BST) and AVL tree using C++ programming language.

1. Create and Use a "Node" class to implement a node of a tree. (Do not use structure (struct))
2. Interfaces for the Dictionary ADT, BST and AVL tree are given in the moodle.
   Dictionary.hpp: abstract Dictionary interface.
   BST.hpp: Interface for BST
   AVL.hpp: Linterface for AVL tree
3. Inherit as much functionality as possible from the BSTree class. Then provide custom AVL Tree functionality on top of that. The AVL Tree should make use of as many BST functions as possible. Override only those methods which are extremely necessary.
4. Your main program should ask the use to input the key each time new key is inserted. Your main program should have following menu of operations and this menu should be displayed each time after the completion of an operation:
   a. Insert a key
   b. Search for a key
   c. Delete a key
   d. Display all the keys as obserbed in inorder traversal
   e. Display all the keys as obserbed in preorder traversal
   f. Display all the keys as obserbed in postorder traversal
   g. Display all the keys as obserbed in levelorder traversal
   h. Display the minimum key in a tree
   i. Display the maximum key in a tree
   j. Display the succesor of a key
   k. Display the predecessor of a key
   l. Display the height of a tree
   m. Exit