Programming Assignment - 10
2-3 Trees, R-B Trees

No Programming required

1) 2- 3 Trees

a) Draw the 2-3 trees that result when you insert the keys Y L P M X H C R A E S T B C A in that order into an initially empty tree. Show all intermediate and final trees after each insertion.

b) Draw the 2-3 trees that result when you insert the keys A L G O R I T H M S X Y Z in that order into an initially empty tree. Show all intermediate and final trees after each insertion.

2) Red-Black Trees

Use left leaning red-black (LLRB) trees as discussed in class for the problems below:

a) Draw the red-black trees that result when you insert the keys Y L P M X H C R A E S T B C A in that order into an initially empty tree. Show all intermediate and final trees after each insertion.

b) Draw the red-black trees that result when you insert the keys A L G O R I T H M S X Y Z J D in that order into an initially empty tree. Show all intermediate and final trees after each insertion.

Programming Assignment

Implement a Red-Black tree using the code provided in section 3.3 and problems 3.39 – 3.41.

Insert the keys 1 to 60 in increasing order into an empty tree. Draw the resulting tree by hand.

Then delete keys 1 to 20 in increasing order. Draw the resulting tree after deleting the first 20 numbers (i.e., after deleting 1-20). You can draw the tree by hand.

You can list the nodes using an in-order or similar traversal and use that to draw the tree.