Assignemnt 3

due Thursday, March 11, 2021

1. Insert into an initially empty 2-3-4 tree, in the order given, the following values:

   12, 13, 17, 10, 4, 6, 9, 15, 30, 25, 20, 40.

   Show the intermediate trees after each insertion that causes a split. For consistency, we will split the nodes in the bottom-up manner. Note that a node is full when it has 3 keys and a full node should be split if a new key is inserted into it. [6 points]

2. Insert the values above into an initially empty red-black tree. Show the tree after each insertion that causes any color shifts or rotations. [6 points]

3. From the tree derived at the end of the previous problem, delete 13 and then 12. [6 points]

Total: 18 points