ADSA-2021 Lab Assignment – 5 Duration: 3 Hrs (Time:2PM to 5PM)

Instructions

1. This is an individual assignment.

2. Your code must completely be your own. You are not to take guidance from any general-purpose code or problem specific code meant to solve these or related problems. Remember, it is easy to detect this kind of plagiarism

3. First TWO PROBLEMS are COMPULSORY. There is a Bonus Question which is optional. Carefully read all problems.

4. **Write only a single main function**. You can call the required functions from the main function.

4. Name the file as follows: S2020xxxxx_A05.c

5. DO NOT zip. **Upload a single .c file** directly to your submission in the common Google classroom.

Q1. Write an insert () function to implement insertion in a B tree of order 4 (or 2-4 tree) with 10 key values (no. of elements in the tree =10). Perform split () whenever required maintaining the property of tree and print the inorder traversal of the tree. From the above tree delete the root node and print the inorder traversal of the final tree. [5]

Q2 Construct a red-black tree by inserting the keys 41, 38, 31, 12, 19, 8 into an initially empty red-black tree. Perform necessary rotation and recoloration [5]

Bonus Question:

In Q2 you inserted the keys 41, 38, 31, 12, 19, 8 into an initially empty red-black tree. Now show the red-black tree that results in successive deletion of the keys in the order 8, 12, 19, 31, 38, 41. Print the inorder traversal of the tree after each deletion. [10]
