Data Structure and Advanced Programming

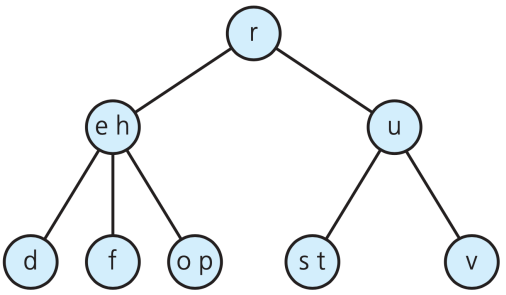
Homework #11
Due: 2021/6/1 08:00am (CST)

NOTE: Please upload your answers in either English or Chinese as a PDF to NTU COOL before the due date and time.

1. (15%) What are the advantages of implementing the ADT dictionary with a 2-3 tree instead of a binary search tree?

2. (25%) Write a pseudocode function that performs a range query for a 2-3 tree. That is, the function should visit all items that are within a given range of values. For example, your function should visit all values between 100 and 1,000.

3. (20%) Given the 2-3 tree in the figure below, draw the tree that results after inserting *k, b, c, y*, and *w* into the tree.



4. (20%) Draw the 2-3-4 tree that results from inserting *o, d, j, h, s, g,* and *a*, in the order given, into a 2-3-4 tree that contains a single node whose value is *n*.

5. (20%) Assume that the tree in the figure below is a 2-3-4 tree, and insert 39, 38, 37, 36, 35, 34, 33, and 32 into it. What 2-3-4 tree results?