CS 3410: Data Structures

Homework 4

Due date: Wednesday, October 24, 2018 at the beginning of class

15pts

1. A binary tree T has 9 nodes. The inorder and preorder traversals of T yield the following sequences: (3pts)

Inorder: E A C K F H D B G

Preorder: F A E K C D H G B

Draw the tree T.

F

/ \

A D

/ \ / \

E K H G

/ /

C B

1. Draw all possible non-similar trees T where (4pts)
2. T is a binary tree with 3 nodes

1 1

/ / \

2 2 3

/

3

1. T is a 2-tree with 4 external nodes

1 1 1

/ \ / \ / \

2 3 2 \* 2 3

/ \ / \ / \ / \ / \

\* \* \* \* 3 \* 4 \* \* 5

/ \ / \ / \

\* \* 6 \* \* 7

1. Suppose the following list of letters is inserted in order into an empty binary search tree: (4pts)

J R D G T E M H P A F Q

1. Find the final tree T

J

/ \

D R

/ \ / \

A G M T

/ \ \

E H P

\ \

F Q

1. Find the inorder traversal of T

A D E F G H J M P Q R T

1. Suppose the six weights 4, 15, 25, 5, 8, 16 are given. Find a 2-tree T with the given weights and a minimum weighted path length P. (4pts)

73

/ \

42 31

/ \ / \

17 25 15 16

/ \

9 8

/ \

4 5

P (Node \* depth + …): 172