

CSI 35 LECTURE NOTES (Ojakian)

Topic 11: Tree Basics

OUTLINE

(References: Finan: Ch7, Rosen: 11.1, 11.2, 11.4)

1. Rooted Trees
 2. Applications
 3. Spanning Trees.
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1. Rooted Tree

2. Applications

- (a) Binary search trees

Definition: For any vertex, all the vertices in its left subtree are smaller, while all the vertices in its right subtree are larger.

PROBLEM 1. *Create a binary search tree from a list of numbers:*

5, 2, 9, 7, 1, 4, 12, 6, 20.

Then search for a number in the tree. Compare the search time in the tree versus the list.

- (b) Decision Trees

PROBLEM 2. *Create a decision tree for sorting 3 distinct elements.*

3. Trees: Equivalent Definitions

- (a) Connected and acyclic.
- (b) Connected, n vertices, $n - 1$ edges.
- (c) Acyclic, n vertices, $n - 1$ edges.
- (d) There is a unique path between any two vertices.

4. Spanning Tree