

Discrete Structures. CSCI-150. Spring 2014.

Homework 11.

Due Fri. May 2, 2014.

Problem 1

How many edges does a full binary tree with 10000 internal vertices have?

Problem 2

Suppose 1000 people enter a chess tournament. Use a rooted tree model of the tournament to determine how many games must be played to determine a champion, if a player is eliminated after one loss and games are played until only one entrant has not lost. (Assume there are no ties.)

Problem 3

Show that a simple graph is a tree if and only if it is connected but the deletion of any of its edges produces a graph that is not connected.

Problem 4

Use Huffman coding to encode these symbols with given frequencies:

A : 0.05, B : 0.07, C : 0.08, D : 0.10, E : 0.15, F : 0.25, G : 0.30.

Show all intermediate steps of the tree construction.

What is the average number of bits required to encode a symbol?