Shawn S Hillyer

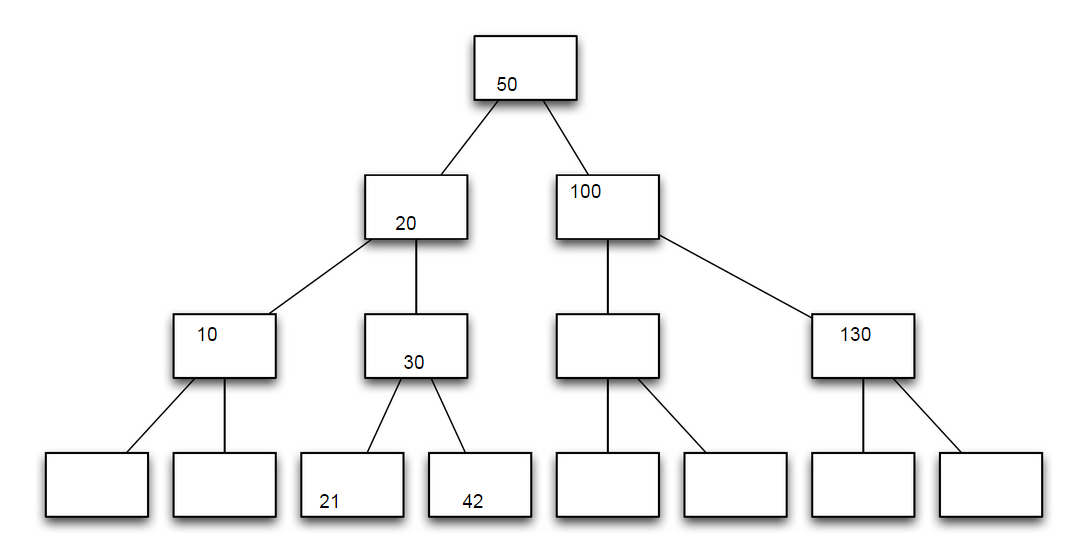
CS 261-400

01/30/2016

**Assignment 4: Answers to questions**

**Show the binary search tree built by adding numbers in this specific order, assuming the graph is empty to**

**start with: 50, 20, 100, 10, 130, 30, 21, 42.**



**Question 2**

The trouble with binary search trees is that they can become unbalanced depending on the order that you

insert values. Give an order for inserting the values 1 through 7 such that the resulting tree is a full binary

search tree. This problem does not require you to fill in a tree, just write down the order in which you would

insert the values. (Hint: it might be helpful to first draw the full tree to figure out how the values must be

arranged, then you can determine the order to add them!)

4 2 1 3 6 5 7

[as long as we add 4 first, and we add 1 and 3 after 2, and we add 5 and 7 after 6, then this will work… so:

4 2 3 1 6 7 5

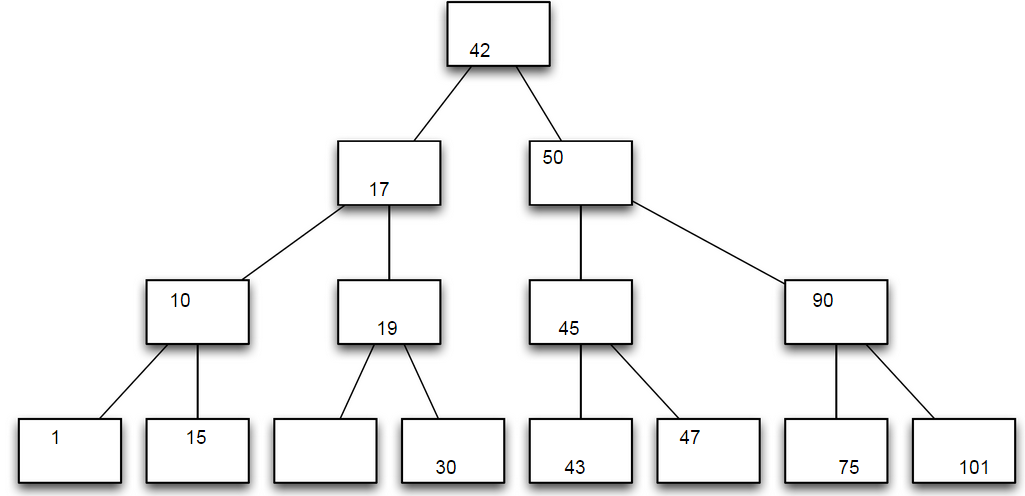
4 6 5 7 2 1 3

4 2 6 5 1 3 7

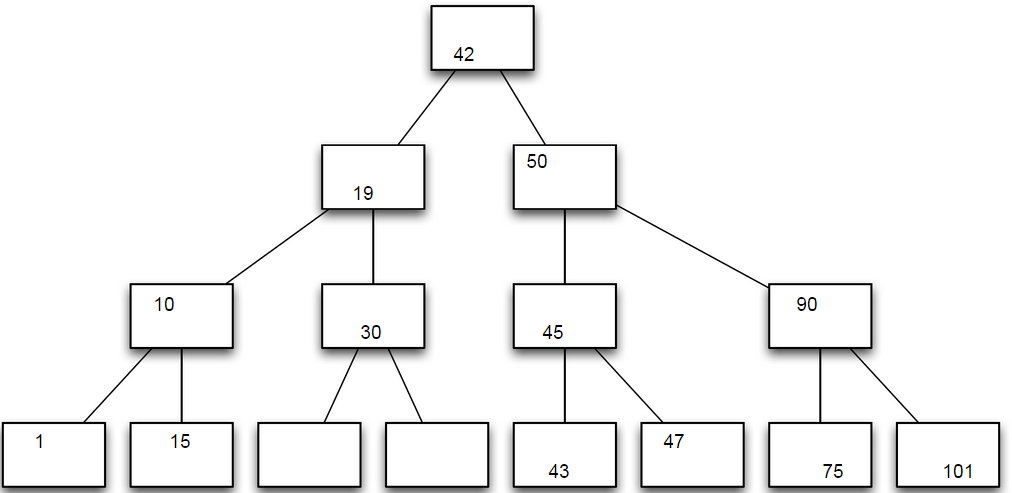
Are just a few alternative solutions

**Question 3**

Part A: Given the following tree, question3.pdf, show the tree after removing the value 16.



Part B: Using the tree produced by Part A, show the tree after removing the value 17.



**Question 4**

The computer has built the following decision tree for the Guess the Animal Game, question4.pdf. The player

has an animal in mind and will answer the questions shown in the tree. Each of the players responses is used

to determine the next question to ask. For example, if the player is thinking of a sea turtle, she would answer

Yes to the first (top) question, "does it live in the water?", which leads to the second question "is it a

mammal?", to which she would answer No.

Show the decision tree that the computer should build after adding a Zergling and a question to differentiate

it, "Does it eat space marines?", to the tree. The question and the animal should be added below existing

questions in the tree. Note that Zerglings *do* eat space marines , *do not* live in the water, *do not* climb trees,

and *are not* mammals (just in case you didn't know :-))

