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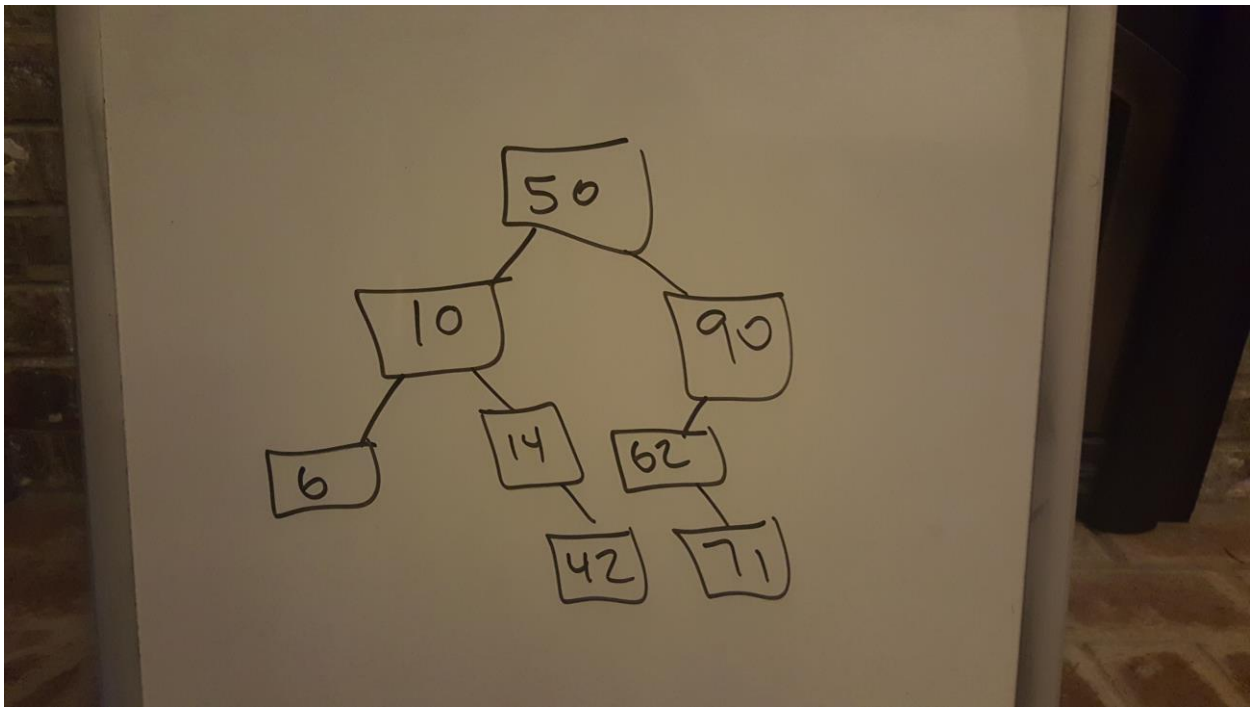
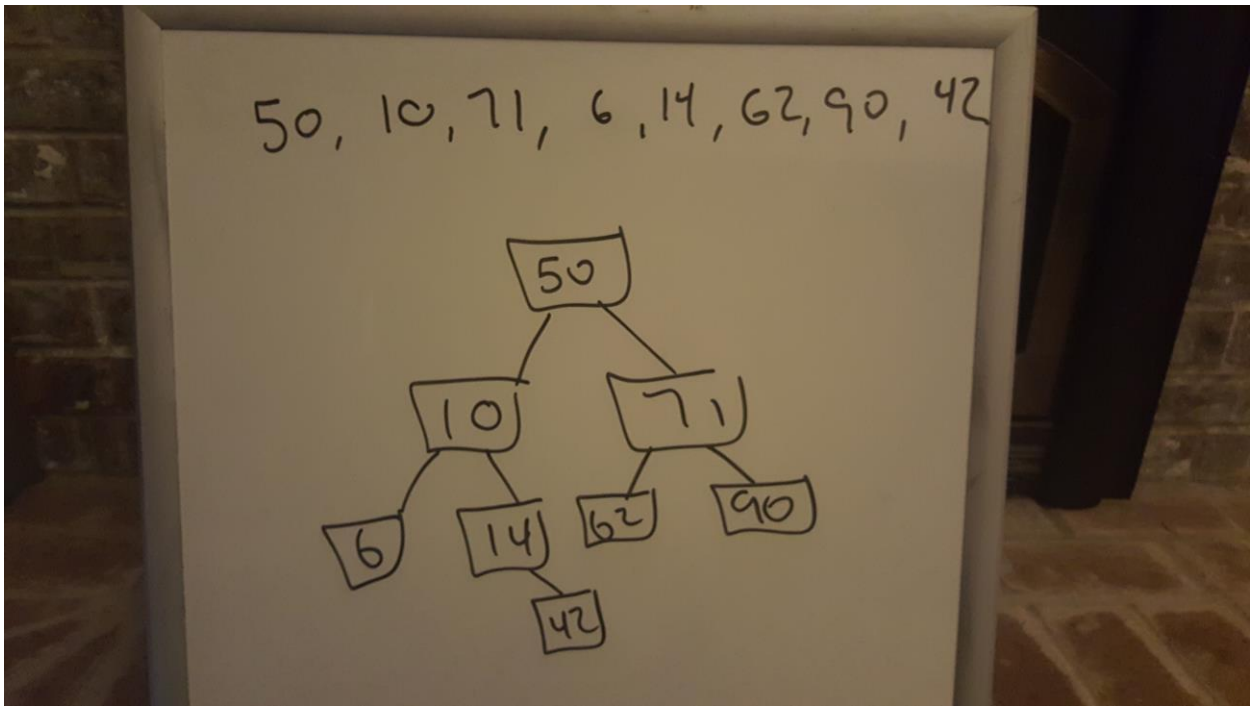
CS 261 Assignment 4

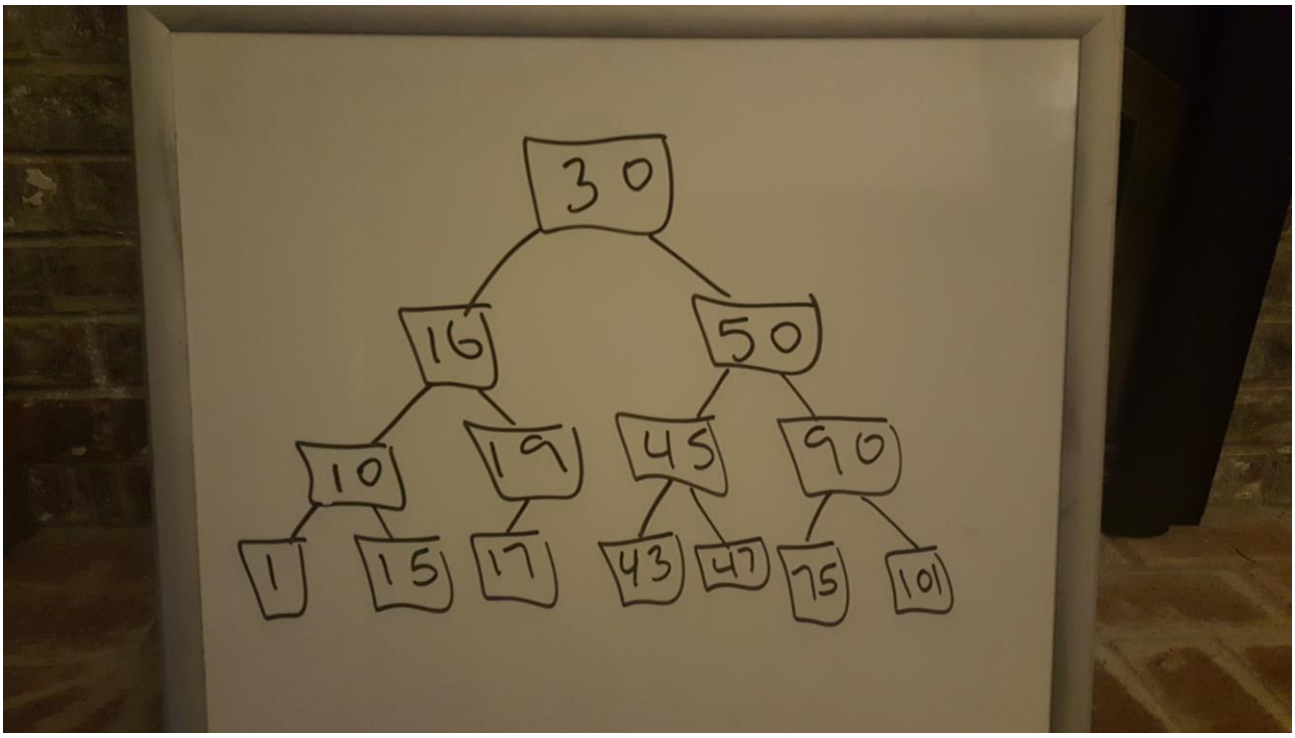
1. Show the binary search tree built by adding numbers in this specific order, assuming the graph is empty to start with: 50, 10, 90, 14, 62, 71, 42, 6. (You may need to add more boxes to the diagram)



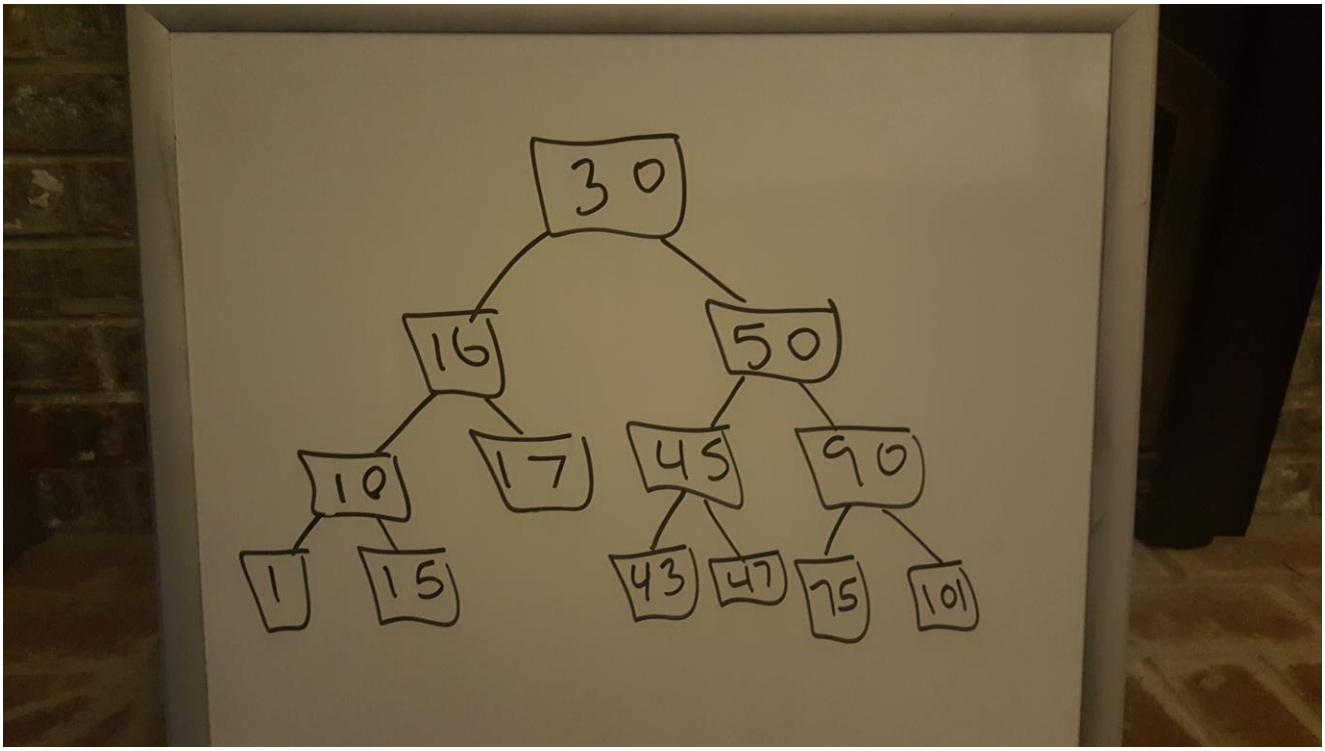
2. The trouble with binary search trees is that they can become unbalanced depending on the order that you insert values. Give an order for inserting the numbers 1 through 7 such that the resulting tree is a full binary search tree. This problem does not require you to fill in a tree, just write down 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!)



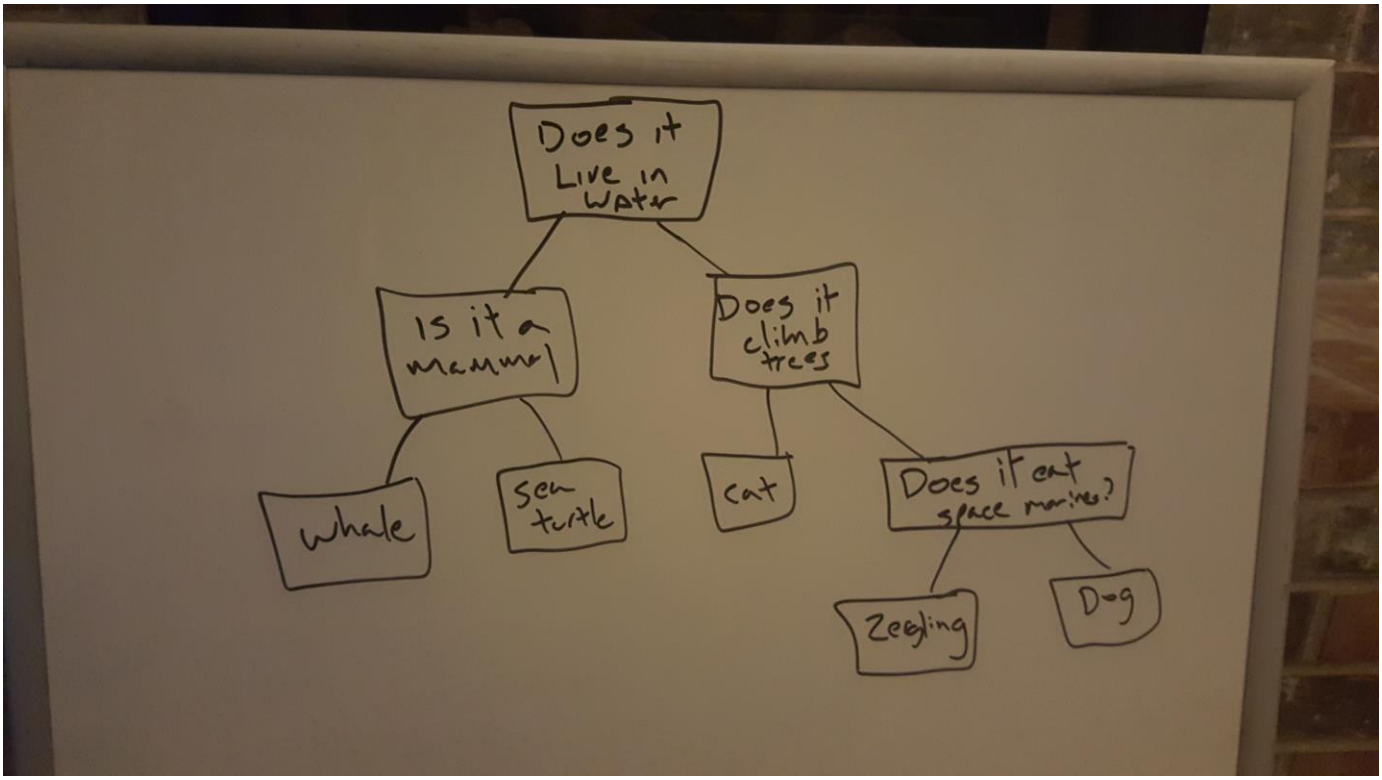
3. A. Given the following tree, question3.pdf, show the tree after removing the value 42.



3. B. Using the tree produced by Part A, show the tree after removing the value 19.



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 :-))


Does it Live in Water
Is it a mammal
Does it climb trees
whale
sea turtle
cat
Does it eat space marines?
Zerling
Dog