

Homework 1

Due Date 6/12/2016, 11:59pm

Submission guidelines:

The assignment is due on midnight on June 12. Assignments turned in after that date are considered late, and will be docked 5% per day or part thereof.

You should submit your homework as an attachment file through Blackboard (or email me to zhuq@uhv.edu, if the Blackboard doesn't work and you need to catch up for the due date).

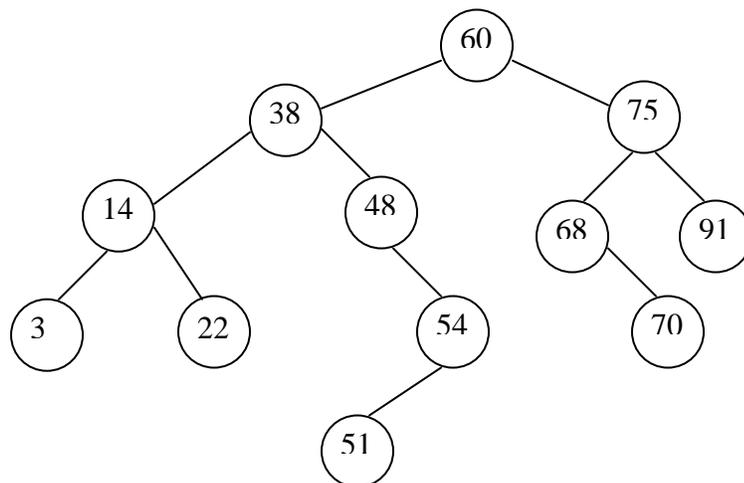
For the written exercises (Part I) you are to turn in your answers in either Word or Text file with your name clearly written on the top of the document, along with the title "Assignment 1, Part I".

For the programming exercise (Part II) you are to turn in:

- a single file named assignment1.java containing all your Java source code
- a single text file named readme1.txt containing your name and any relevant information about your program (known bugs, compilation or operating anomalies, or instructions, etc).
- a single file containing the outputs of several test runs of the program demonstrating that the program works in all reasonable cases.

Part I: written exercises.

1. Begin with the following binary search tree, **draw** the BST that results after the operation or sequence of operations is performed. (**All questions are independent and each question starts from the BST as following**)



- a. How many leaves are in the tree?
 - b. What is the height of node 38? What is the depth of 54? What is the height of the tree?
 - c. Insert 20, 10, 65, 42, and 94
 - d. Delete 48, 75, and 22 (based on the original figure, NOT on c).
 - e. Insert 45, delete 48, insert 59, delete 75, insert 94, delete 91 (based on the original figure, NOT on d).
2. For the infix arithmetic expressions below, **draw a binary tree** that represents the expression, and then use tree traversals to find the equivalent **prefix** and **postfix** expressions.
- a. $(A-B)-(C+D)$
 - b. $(A/B)-(((C-D)-E)-F)$
 - c. $((A*B*C)-(D-E*F))/((G-H)*(I+J))$
3. Construct the Huffman tree and show the encoding for the some words and weights given in the following table.

Words	Weight
a	5,000
b	2,000
c	10,000
d	8,000
e	22,000
f	49,000
g	4,000

Part II: programming exercise

Text programming project 8.3 on page 426. Please use a string as the input from user.