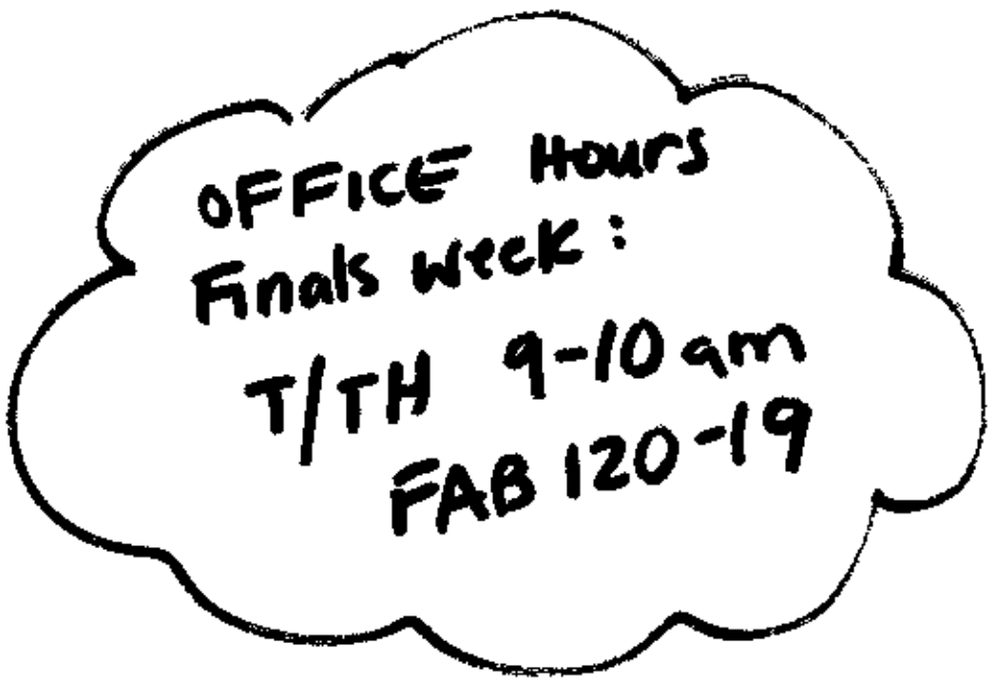
** Final Exam **

- BST
- Trees (2-3, 2-3-4, Red Black, AVL, B tree)
- Hash Table

CODE
- BST
- LLL
- DLL
- CLL



Final *(100 points)*
CS 163: Data Structures

Name: _____;

Date: _____

Email Address: _____

Please limit "short answer" questions to 1-2 sentences.

1. Short Answer (25 points) -- Limit your answers to 2-3 sentences --

a) Explain the difference between the insert algorithm for a 2-3 tree vs. a 2-3-4 tree

b) Explain the benefits of hash tables

c) Compare and contrast the efficiency of two sorting algorithms (of your choice) – include execution speed as well as memory concerns in your answer

d) Explain the benefits and drawbacks of the AVL tree

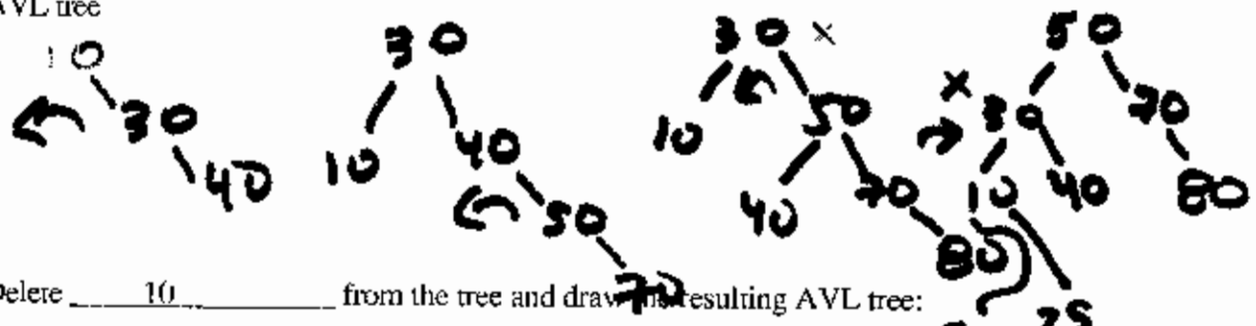
e) Explain how much memory is required to manage a 2-3-4 tree?

f) Explain how much memory is required to manage an AVL tree?

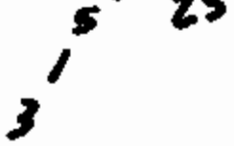
2. (25 points) Given the following data, draw the following trees:

10 30 40 50 70 80 5 25 3

a) AVL tree



b) Delete ____10_____ from the tree and draw the resulting AVL tree:



c) 2-3 tree

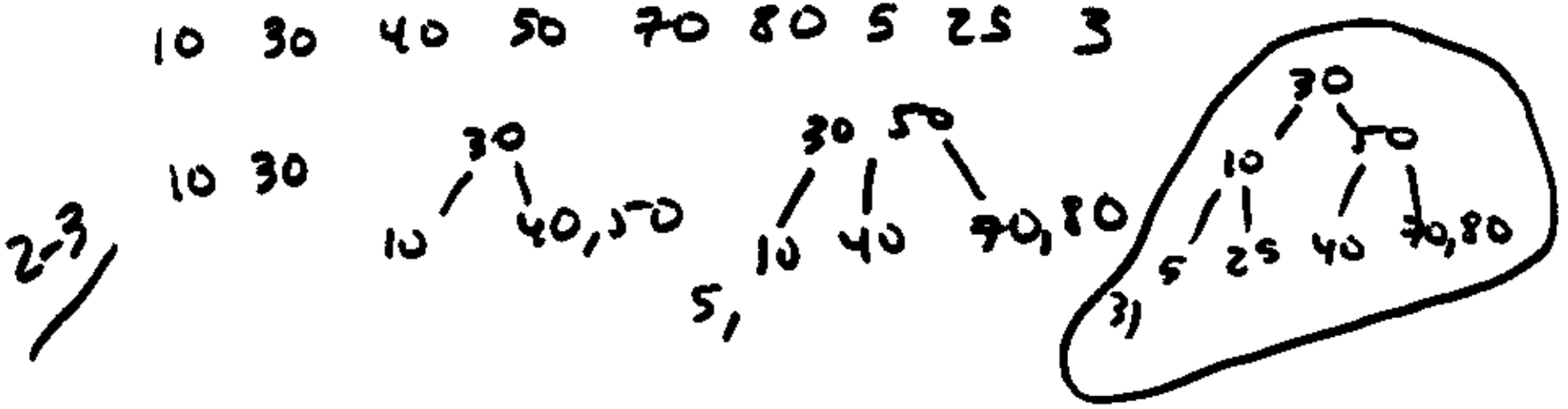
d) Delete ____30_____ from the tree and draw the resulting 2-3 tree:

e) 2-3-4 tree

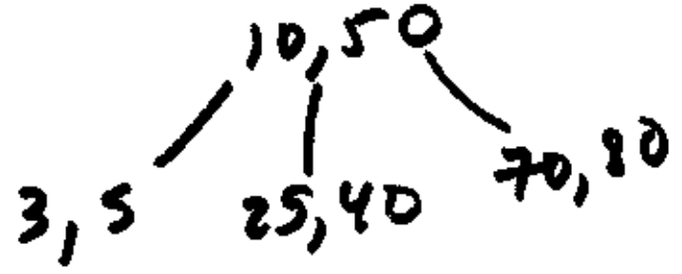
f) Now, add 90 to the 2-3-4 tree -- what would the resulting tree be?

10 30 40 50 70 80 5 25 3

2-3



Delete 30



2-3-4