

CS 24, Fall 2014

HW8: Homework - to be done before Lab08 (50 total points)

Print this form, and write your answers on it.

Accepted: on paper, at the beginning of your lab section on Monday, Dec 1.
Place on front desk, before getting seated.

Name (1 pt): _____

Umail (1 pt): _____@umail.ucsb.edu

Lab Section (1 pt) Circle one: 12:00 1:00 2:00 3:00

1. Read Chapter 8, about trees generally, but mostly about Binary Search Trees.

a. (5 pts) What is a Binary Search Tree?

b. (6 pts) Draw the Binary Search Tree structure that results by inserting the following values in this order: 17, 6, 22, 11, 25, 4

c. (6) The "in-order" traversal of the values inserted in part b is 4 6 11 17 22 25. Show both the "pre-order" and "post-order" traversals.

pre-order:

post-order:

2. (6 pts) Let the following structure be a node of a Binary Search Tree:

```
struct TreeNode {  
    int info;  
    TreeNode *left;  
    TreeNode *right;  
};
```

Complete the following function to return the greatest value in the tree:

```
int greatest(TreeNode *tree) { // use iteration or recursion; your choice  
    if (tree == NULL) return 0;
```

```
}
```

3. (4 pts) why are linked node structures usually used instead of arrays to implement Binary Search Trees?

4. (4 pts) why are tree functions usually implemented using recursion?

5. Read section 9.2 in Chapter 9, about Heaps.

a. (4 pts) what is a "complete binary tree" structure?

b. (4 pts) what is a Heap?

c. (4 pts) why are arrays instead of linked nodes used to implement Heaps?

6. (4 pts) Refer to section 9.1 if necessary: why are Heaps usually the best choice for implementing Priority Queues?

End of Hw8