Quiz 6: Binary Search Trees (BSTs)

CS 14 - Data Structures

April 24, 2013

All questions refer to the following definition of a Tree:

```
template <typename T> struct Tree
{
  T val;
  Tree<T> *left, *right;
};
```

Questions:

1. State precisely what property a binary search tree must maintain.

2. What are the best and worst case run times for the following operations:

	best	worst
(a) insert		
(b) remove		
(c) find		
(d) create		
(e) merge		

   Note: You MUST be able to implement each of these functions. You WILL be asked to reproduce at least one of them on the second midterm.

3. Give a linear-time algorithm that tests whether a binary search tree satisfies the search tree order property at every node.

4. Give a linear-time algorithm that takes as input an arbitrary tree, and returns a new tree identical to the old tree, except that all of the leaf nodes have been removed.