BSTs

10-28-2011

Opening Discussion

- Minute essay comments:
  - Heterogeneous maps in Scala.
  - I leave today around 1:30 with programming teams.
  - Use of traversals.
  - Pre-order expressions require parentheses.

Binary Search Trees (BST)

- One of the best uses of binary trees is the binary search tree. They make a more efficient implementation of the map ADT.

- In this type of tree, we store a key and data in every node and below any node we put lesser key values to the left and greater key values to the right.

- We find elements by going down the tree always going left or right. This gives us behavior like a binary search, but the tree is more flexible because adds and removes are quite efficient as well.

Adding and Removing

- The code for both adding and removing from a binary tree begins like a search that keeps track of previous (much like a singly linked list).
  - The add always goes to a leaf and adds the new element to the proper side.
  - The remove replaces the node we are removing with either the greatest node on the left or the smallest node on the right.
- Recursion can be used to make some nice solutions.

Coding

- I want us to code a BST based mutable map together.

Minute Essay

- What can go wrong with the type of binary tree that we wrote today to make it perform poorly?