Lab 6 Recap, Sorting, BST Removal

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Outline

- Lab 6 Recap / Sorting
- BST Node Removal

$O(n^2)$ Sorting Algorithms

- Bubble sort
  - Bubble the largest element to the end in each pass
- Insertion sort
  - Insert the next element into the sorted portion of the list
- Selection sort
  - Find the smallest item and put it in its proper location

O(nlog(n)) Sort Algorithms

- Merge Sort
  - Break the problem up until you have 1 or 2 items and put them in order
  - Merge the sorted lists O(k) where k is the size of the small lists
  - T(n) = 2T(n/2) + O(n) === O(n*log(n)) (masters theorem)

BST Remove

- If the node has no children simply remove it
- If the node has a single child, update its parent pointer to point to its child and remove the node

Removing a node with two children

- Replace the value of the node with the largest value in its left-subtree (right-most descendant on the left hand side)
- Then repeat the remove procedure to remove the node whose value was used in the replacement

Removing a node with two children