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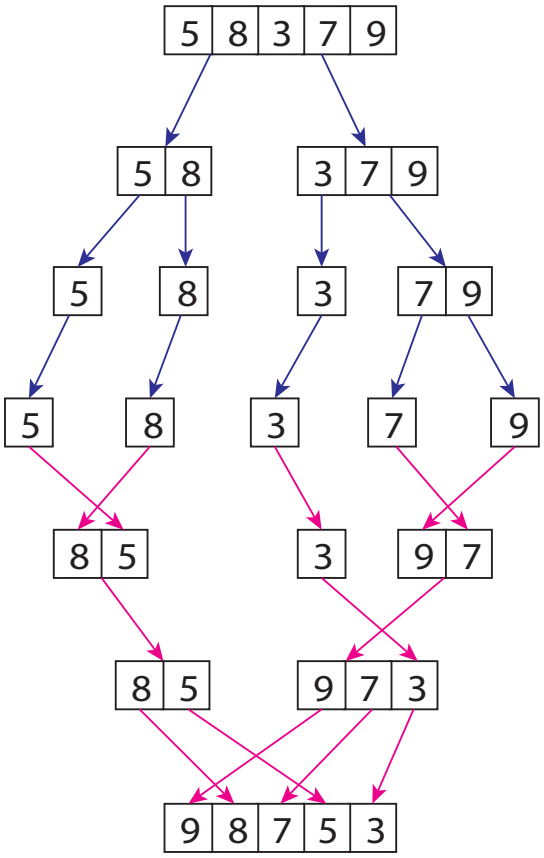
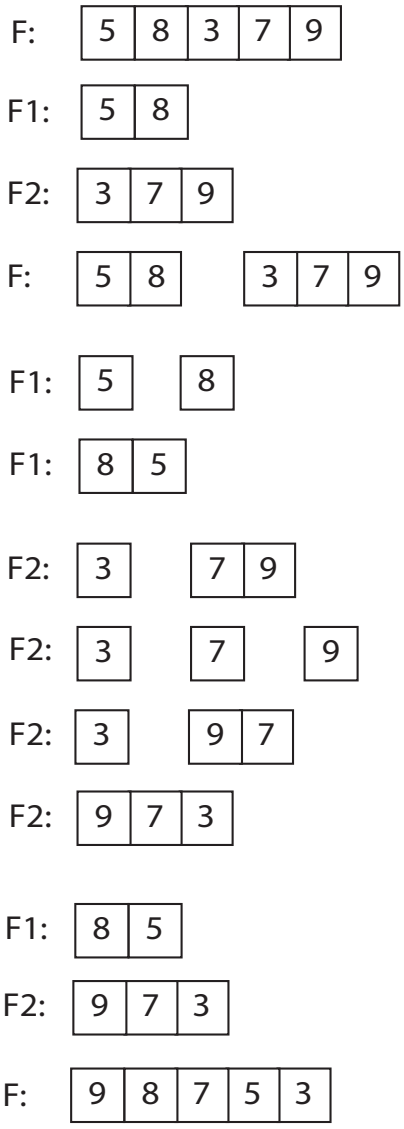
Homework Submission 6
02/16/2016

CST 370
Homework (Sorting and Trees)

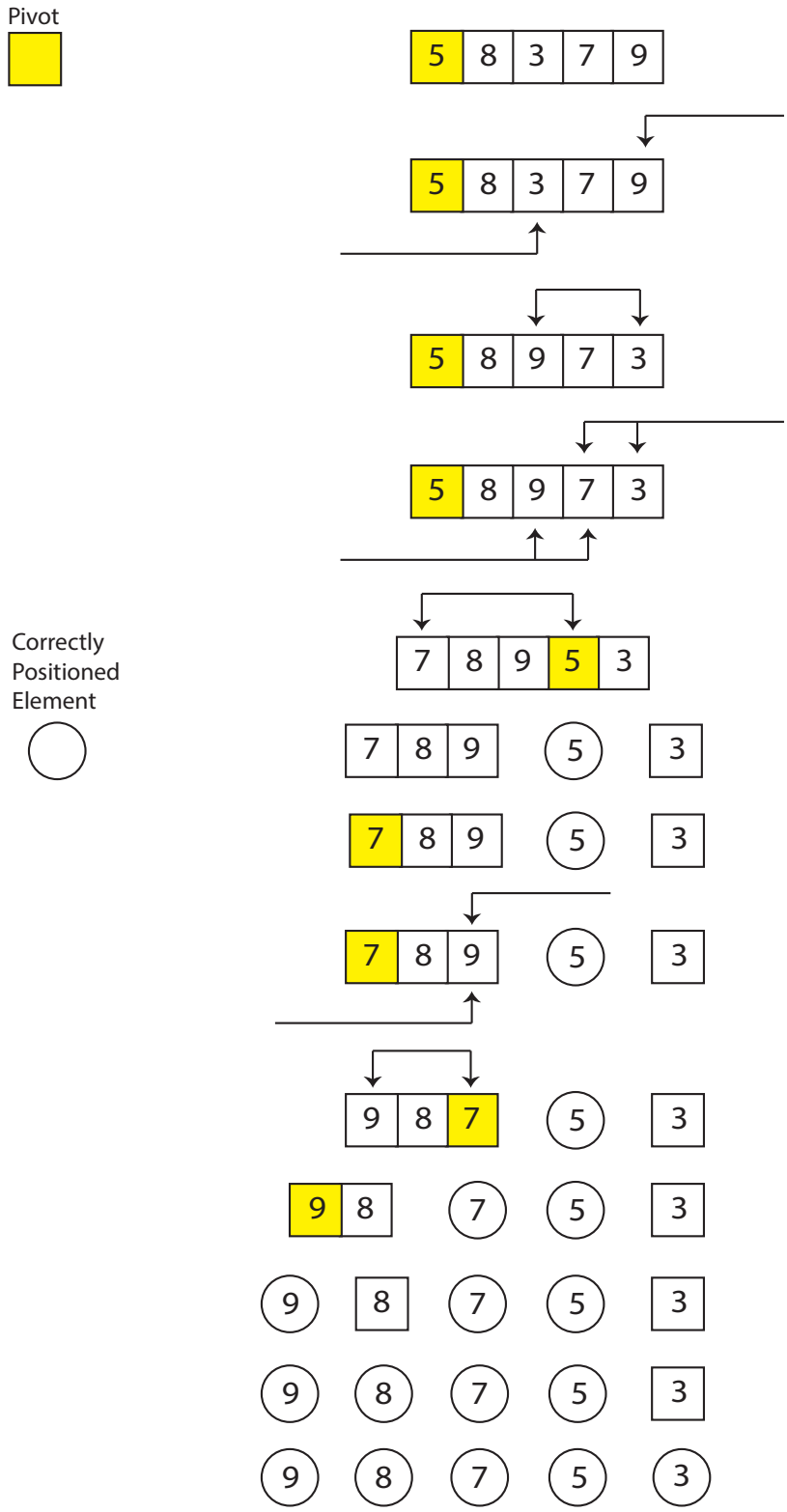
1. Consider the following unsorted array of numbers – 5, 8, 3, 7, 9. Obtain the numbers in sorted order (descending) by applying the **merge sort algorithm**. You are required to outline each step of the algorithm (i.e., show the state of the list after each iteration of the algorithm)

Since merge sort is O(n) in terms of space complexity two separate arrays are created to sort the original array. The algorithm completes the split and merge on the first array (left side) and returns 8, 5. Then completes the split and merge on the second array (right side) and returns 9, 7, 3. Finally the algorithm merges the two arrays in descending sorted order.

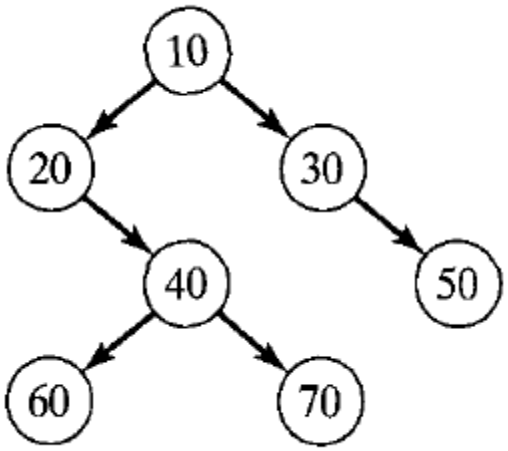




2. Consider the following unsorted arrays of numbers – 5, 8, 3, 7, 9. Obtain the numbers in sorted order (descending) by applying the quick sort algorithm. You are required to outline each step of the algorithm (i.e., show the state of the list after each iteration of the algorithm)



3. Is the following tree a binary tree? If so, is it a binary search tree? **Binary Tree = YES**
Binary Search Tree = NO



4. Is the following tree a binary search tree? **Binary Search Tree = NO**