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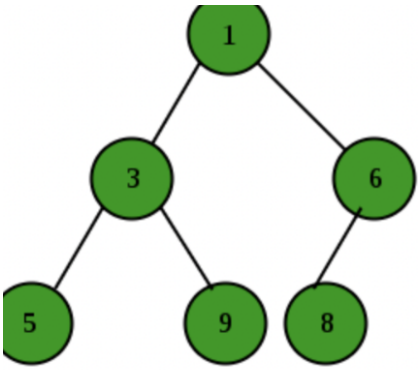
Paper Assignment 4

Sorting

1) An array that is in sorted order is NOT a min-heap.
   For example a sorted array would look like this : {1, 3, 5, 7}.
   And a min-heap tree example could look like this :
   And it's array is : {1, 3, 6, 5, 9, 8}



2) Instead of taking the last element as a pivot we choose the element at position [n / 2], which is the middle element of the sequence.
   On a sequence that is already sorted, the running time of this version of quick-sort would be O(n log n).
   This comes from the fact that the sequence is split every time, which is O(log n) and that you need to loop through the sequence every time, which has a time complexity of O(n). Therefore the running time will be : O(n) * O(log n) = O(n log n).

3) The third line helps with efficiency as it checks if the String is equal to the string we are looking for, which would be useless.

4) The sequence of values removed by the remove maximum operation is :
   r - r - p - o - t - y - i - i - u - q - e - u