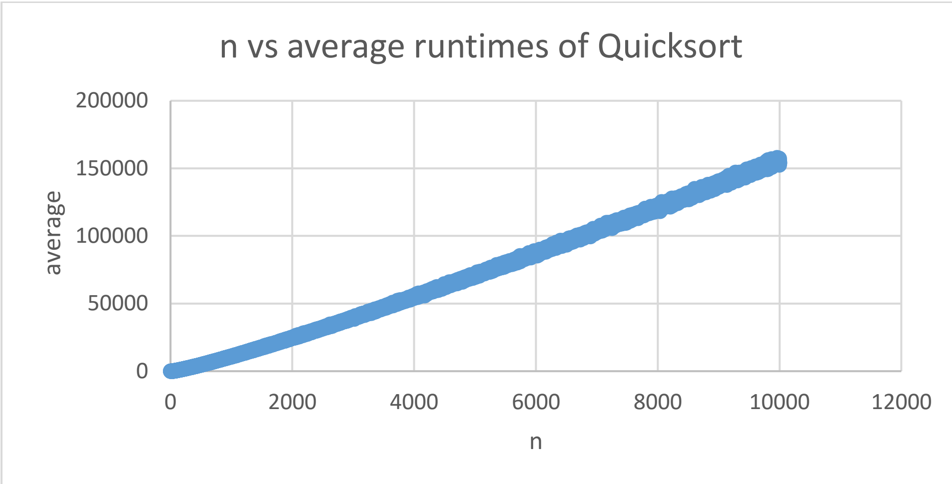
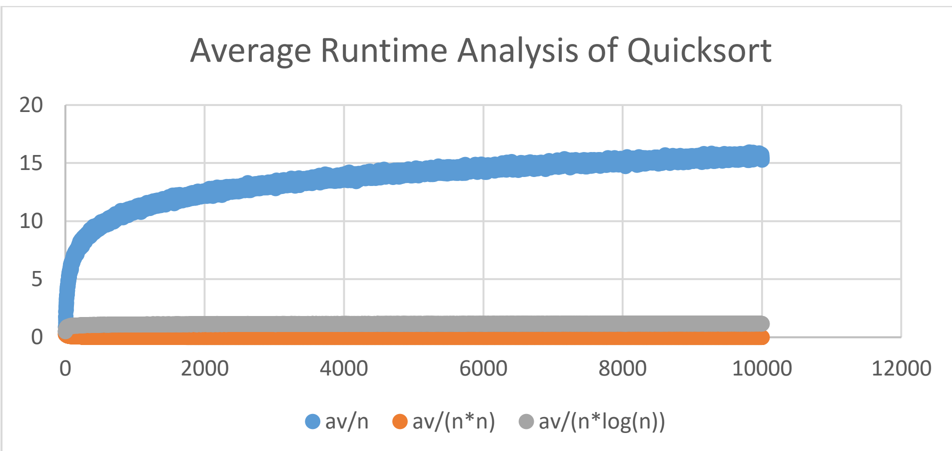
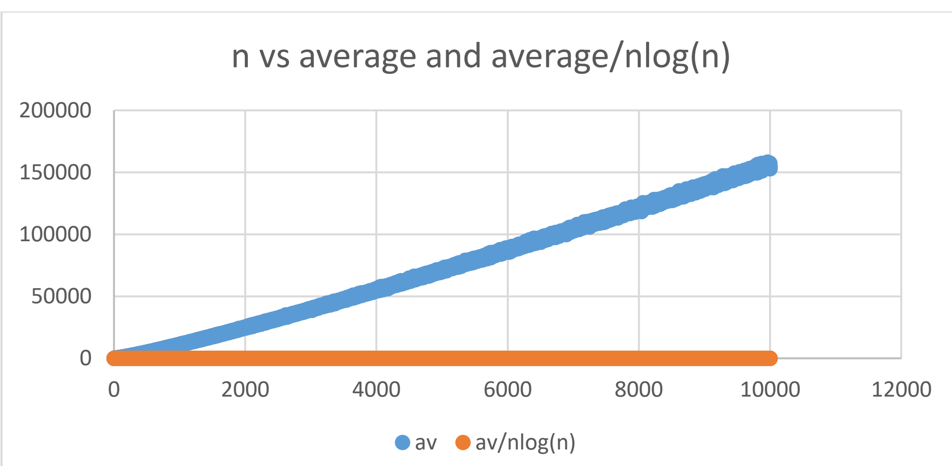
Quick Sort



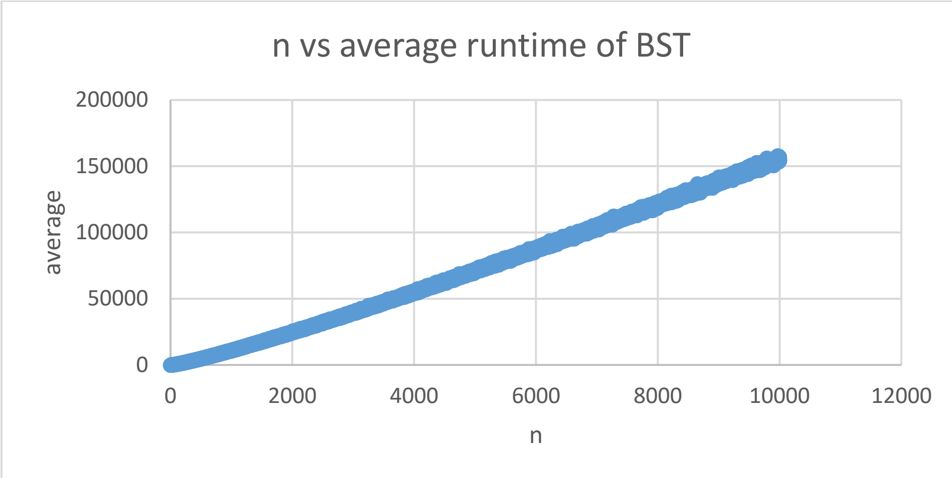


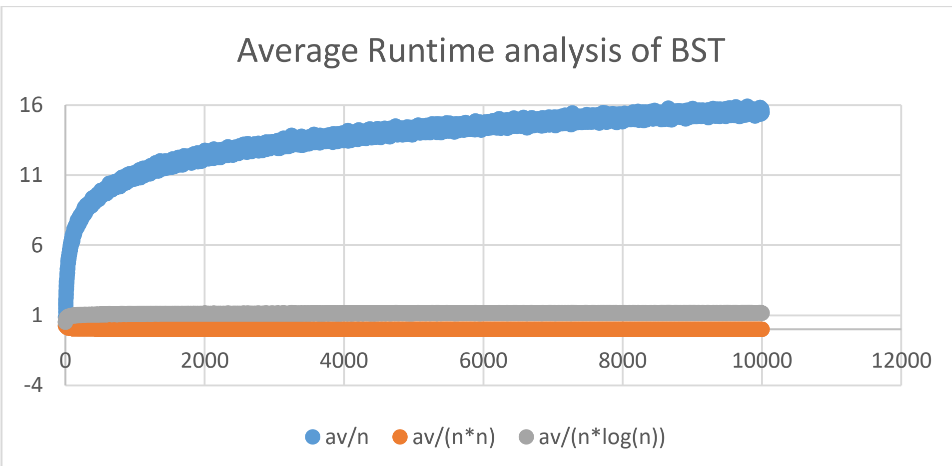
From our theoretical proof, we know that average run time for quicksort should be order of nlog(n).

From the graph, we can see that for both av/n^2 and av/nlog(n) we are getting constant curve but nlog(n) is more nearer to average. So average runtime of quick sort is $\theta(n\log_2(n))$. Below is the graph showing av and av/nlog(n).

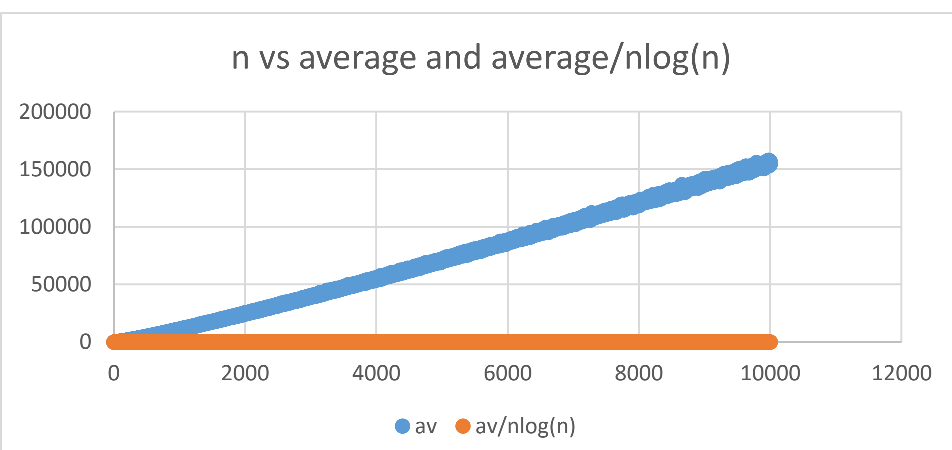


Binary Search Tree

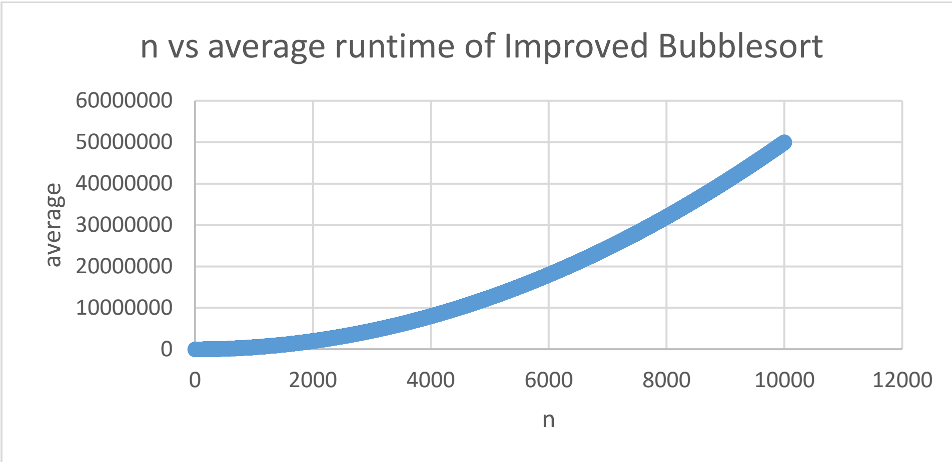


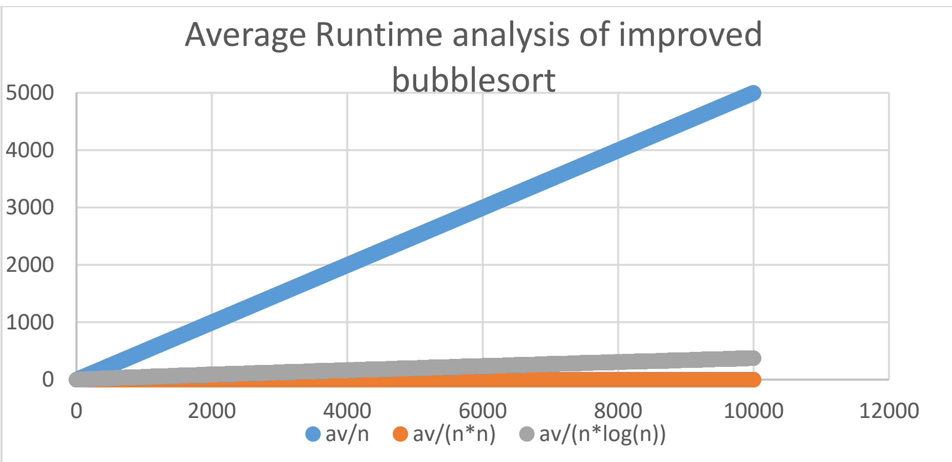


we know that average run time for BST should be in between n^2 and nlog(n).From the graph, we can see that for both n^2 and nlog(n) we are getting constant curve but nlog(n) is more nearer to average. So average runtime of BST is θ(nlog$_2$(n)). Below is the graph showing av and av/nlog(n).



Bubble sort





From the above graph, we can see that for both average/nlog(n) is slowly increasing and for average/n^2 we are getting constant curve. So average runtime of bubble sort is θ(n^2). Below is the graph showing av and av/n^2.