ECE 368 PA3

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The space complexity of the program as a whole is O(n). There are no guarantees that tree won’t be one sided. As such, during all processes it is possible that there are *n* stack frames. A well balanced tree will have log(n) frames, and that is also true in the average case.

Time complexity is n for all functions. Each node only needs to be created once, and because the input file is written preorder, it is easy to create a function that only goes through the tree once. Printing post-order require just a simple run through of the tree, touching every leaf and branch. Packing requires a similar run through. There is no need to visit the same node twice. Printing that information does not require more effort either, it’s also n. Finding and printing the coordinates is possible with a single run through of the tree. Using the dimensions now written to each node, it is possible to find the coordinates through simple comparisons. Because there is a “find maximum” function that needs to be used, it can take longer than the previous functions, but its complexity is still O(n).