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Data Structures and Algorithms

Critical Reflection

Week 4 – Task B

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**Analysis of tasks**

What went well

Successfully implemented searching the lexicographically largest entry within the tree and retrieving the lowest common ancestor of two user input entries. There are some error filtering concerning the search queries of the two queries wish to find the LCA for, whether the ancestor is within the tree or not.

Encountered difficulties

To find the LCA was the most challenging when working with a stack. The issue encountered was to find the common ancestor within the tree, this required identification of the parents of each entry and in which branching of the tree from the root the two entries reside. This was difficult to implement particularly with larger trees as the distance between two entries could span up to the root + 1 node.

**Difficulty assessment**

The lowest common ancestor was difficult to solve, it consists of several parts. Storing the parent of each node, if the children are the nodes that are being searched for return the parent. If the nodes searched for are in separate paths from the root node return the root node. The challenging problem is in returning the parent of two nodes who don’t share the same parent, this requires the algorithm to back track to find the lowest common ancestor one way of doing this would be to store the paths to each node and compare them to find the LCA of them, another would be to backtrack till a common ancestor is found. The choice was the former, this meant comparing the two paths, however, this was not successfully implemented as any trees which span more than 4 depths were difficult to assess and to return the LCA.

**Improvement/Reflection**

The task overall worked well, however, would have correctly configured a function to correctly return the LCA of two which are divergent of different parents. This works on a small-scale tree but a better algorithm to correctly return the LCA would be better. Backtracking and identifying would have done this. This was difficult to visualise and then to code. All in all the task was completed with some error catching however would like to add some filtration for user input of entries in the tree to search for.