Project 3

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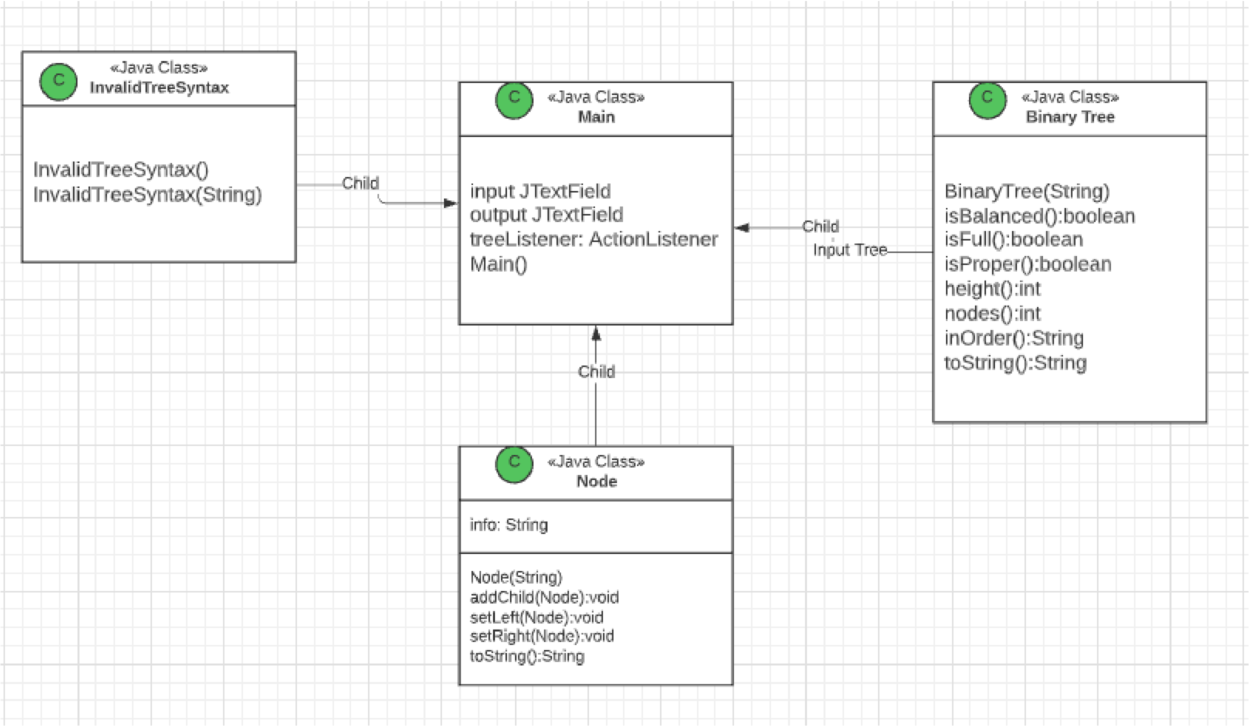
Binary Tree

Contents

Assumptions

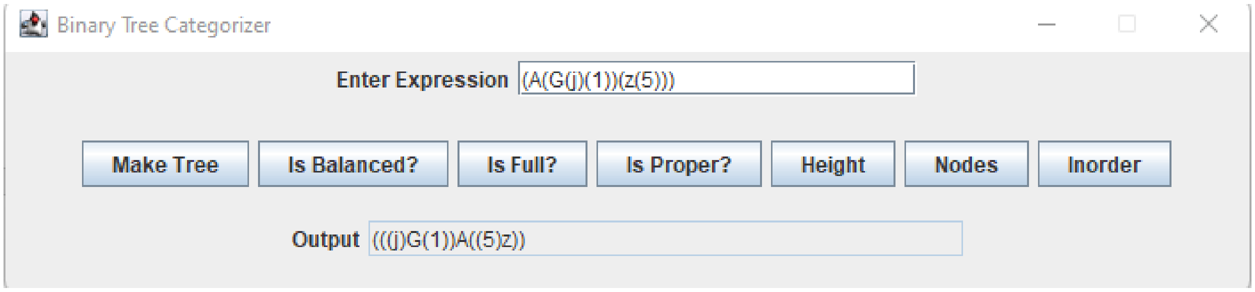
I have made no assumptions prior to working on this script. Binary Tree functions were rather new to me and working with and understanding how to connect a binary tree to its children (nodes) came with a large difficulty that I believe I overcame. I trust that I’ve covered this program with at minimum 90% efficiency and accuracy. There are some strong takeaways with this script that will be mentioned further in the lessons learned.

UML Diagram



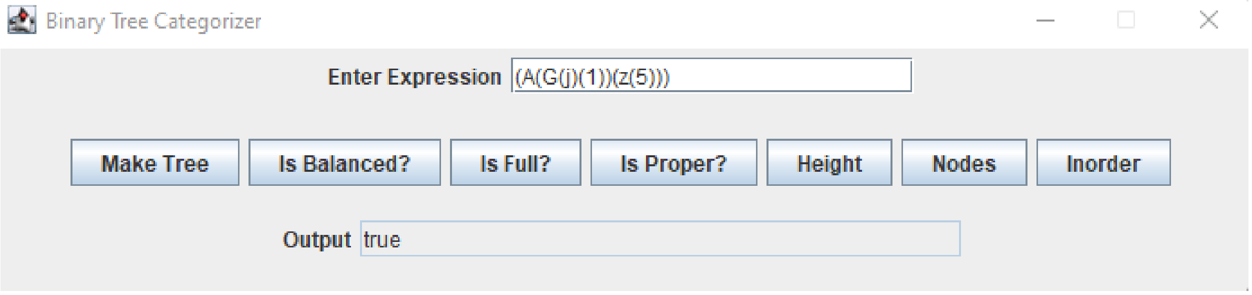
Test Cases

- Test cases include balanced and unbalanced binary trees (3)



Enter Expression (A(G(j)(1))(z(5)))

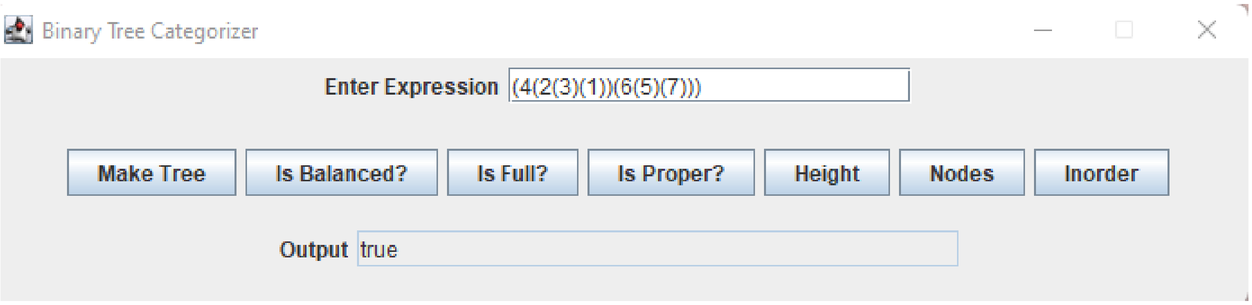
Output (((j)G(1))A((5)z))



Enter Expression (A(G(j)(1))(z(5)))

Output true

isBalanced = True

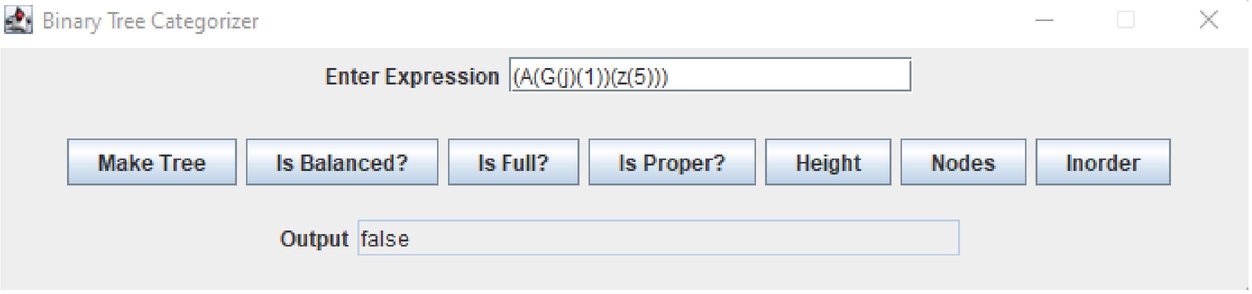


Enter Expression (4(2(3)(1))(6(5)(7)))

Output true

isBalanced = False

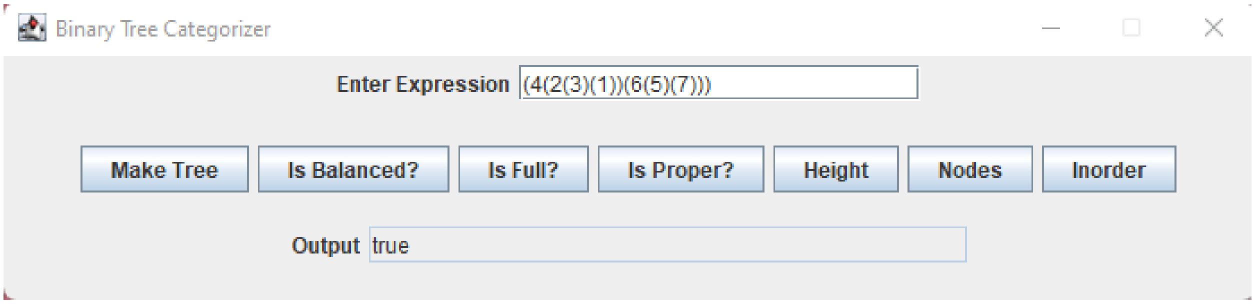
- Test cases include binary trees that are full and trees that are not (2)



Enter Expression (A(G(j)(1))(z(5)))

Output false

isFull = False

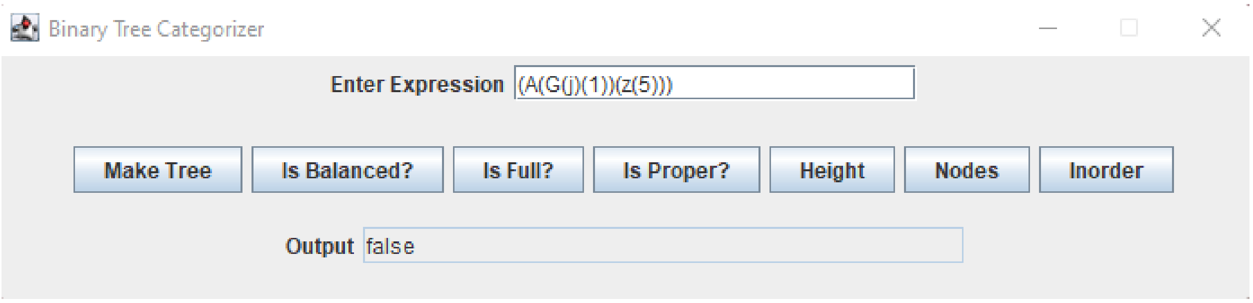


Enter Expression (4(2(3)(1))(6(5)(7)))

Output true

isFull = True

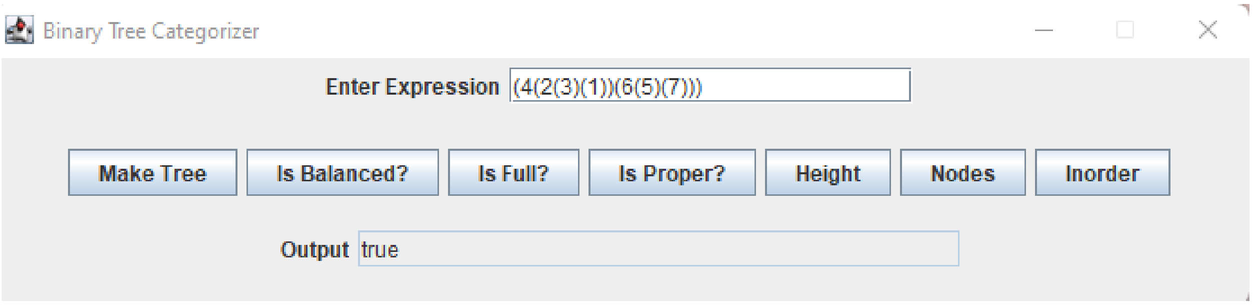
- Test cases include binary trees that are proper and trees that are not (2)



Enter Expression (A(G(j)(1))(z(5)))

Output false

isProper = False



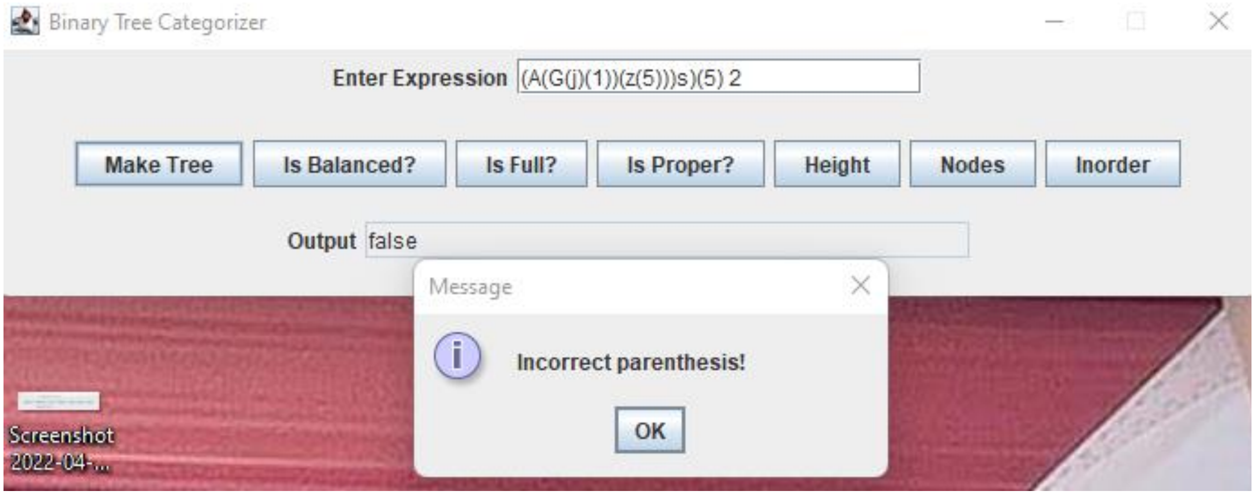
Enter Expression (4(2(3)(1))(6(5)(7)))

Output true

isProper = True

- Test cases include a variety of input strings with syntax errors (3)

Incorrect Syntax



Enter Expression (A(G(j)(1))(z(5)))s)(5) 2

Output false

Incorrect parenthesis!

Lessons Learned

I’ve learned a lot working with Binary Tree’s over the last week. Before this class and project, I wasn’t entirely sure how to craft a binary tree using an input expression. Now I find it a bit simpler, but still have much room to understand further what I am creating. For example, an unbalanced tree would be something like (A(B(1)(2))(C(3)(4))), where A, B, and C would represent parents, and the numerical representing child nodes. This is still a bit rough understanding, but it helped me get through the project a bit more efficiently and helped me understand how to draw out the second half to my test cases alone. I’ll continue working towards understanding the concept but am happy to have at least a bit more understanding now.