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TidBIT

Donald Knuth is one of the most famous computer scientists/mathematicians of our time. He published a series of books called *The Art of Computer Programming* that are still referenced today. In one of his books, he drew a tree the same way we would see it in nature, with the root at the bottom growing upwards and the leaves at the top. However, most computer scientists opted to draw the trees "hanging" instead because there is a tendency for hand-drawn charts to grow downwards instead of upwards. In other words, as you add nodes into the tree, it's easier to add them below the tree rather than above the tree. Hence, computer science trees hang and grow downwards.

Required Resources

Textbook: *Data Structures and Algorithms*, Chapter 6 (/d2l/common/dialogs/quickLink/quickLink.d2l?ou=1860222&type=lti&rcode=snhu-2534452&srcou=1040994)
This zyBooks reading will provide you with information on the following topics:

- Binary trees, applications of trees, binary search trees (BST), BST search, BST insert, BST remove, BST inorder traversal, BST height and insertion order, and BST recursion

Additional Support (Optional)

Video: CS 260 Lesson 6 Binary Search Tree (https://youtu.be/kq0LPPNwvzQ) (47:48)
This resource provides a video walkthrough of implementing a binary search tree in C++ using recursion and simple while loops for different operations.

Reading: BST Traversal (course_documents/CS%20300%20BST%20Traversal.pdf?isCourseFile=true&ou=1860222)
This document provides examples of the BST traversal methods inOrder, postOrder, and preOrder. You may use this resource to help with the programming assignment in this module.

Website: C++ Tutorial (https://www.w3schools.com/cpp/default.asp)
This resource provides an in-depth tutorial to help you learn about C++. This guide may be helpful for all your programming assignments and projects in this course.

Website: C++ Files (https://www.w3schools.com/cpp/cpp_files.asp)
This webpage provides a close look at C++ files, including iostream and fstream. This resource may be helpful for all your programming assignments, milestones, and projects in this course.