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Computer Science 201 - Assignment 1: Creating a Binary Search Tree

If you have a Study.com College Saver membership and are seeking college credit for this course, you must submit an assignment and pass the proctored final exam. You must submit your assignment before registering for the final. Below you will find prompts and instructions for submitting your assignment.

About this Assignment

In this course, you have learned about trees in data structure, binary trees, and binary search trees. For this assignment, you will develop an application using the Java programming language.

Assignment Prompt

The application must address the following requirements:

- Include a user interface allowing a user to interact with the binary search tree.
- When a user runs the application, it displays a menu and prompts the user to select an option.
- The menu options are:

1. Create a binary search tree
2. Add a node
3. Delete a node
4. Print nodes by InOrder
5. Print nodes by PreOrder
6. Print nodes by PostOrder
7. Exit program

- When a user selects 1) Create a binary search tree, the application creates a binary search tree with the given data (1001, 1003, 1005, 1007, 1009, 1011, 1013, 1015, 1017, 1019).
- When a user selects 2) Add a node, the application prompts the user to input a value for the new node. The application needs to insert the value to the existing binary search tree.
- When a user selects 3) Delete a node, the application prompts the user to input the value of the node that will be deleted. The application needs to delete the node.
- When a user selects 4) Print nodes by InOrder, the application prints the nodes of the current binary search tree by traversing it using in-order traversal.
- When a user selects 5) Print nodes by PreOrder, the application prints the nodes of the current binary search tree by traversing it using pre-order traversal.
- When a user selects 6) Print nodes by PostOrder, the application prints the nodes of the current binary search tree by traversing it using post-order traversal.
- When a user selects 7) Exit program, the application ends.

Related Lessons

If you'd like to review Study.com course material for this assignment, please refer to the following lessons:

- Trees in Data Structures: Methods & Examples
- Binary Trees: Applications & Implementation
- Practical Application for Data Structures: Trees
- Binary Search Trees: Definition & Uses
- Strengths & Weaknesses of Different Search Algorithms
- Practical Application for Data Structures: Search Trees

Grading Rubric

Your project will be graded on the following rubric:

Category	**Unacceptable (0-2)**	**Needs Improvement (3-6)**	**Good (7-8)**	**Excellent (9-10)**	**Total**
Program Specification (x3)	The program does not or partially meets the requirements and contains multiple major errors.	The program partially meets the requirements or contains at least one major error.	The program meets all the requirements but contains one or two minor errors.	The program meets all the requirements and works without any errors.	30
Code Efficiency (x1)	The code employs inefficient algorithms and includes unnecessary components.	The code employs inefficient algorithms or includes unnecessary components.	The code employs efficient algorithms but includes some unnecessary components.	The code employs efficient algorithms and doesn't include unnecessary components.	10
Code Readability (x.5)	The code is not easily understandable and contains improper naming and formatting.	Most parts of the code are not easily understandable or contain improper naming and formatting.	The code is mostly understandable and uses proper naming and formatting.	The code is easily understandable and well-organized and uses proper naming and formatting.	5
Documentation (x.5)	No or very few documentation exists.	The documentation is ambiguous or doesn't not explain what the code is accomplishing and how.	The documentation explains what the code is accomplishing and how but doesn't cover all the important parts of the code.	The documentation clearly explains what the code is accomplishing and how.	5
Total Points					50

Before You Submit

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How to Submit Your Assignment

When you are ready to submit your assignment, please fill out the submission form and copy your code into a Microsoft Word document or .txt file. You should receive your assignment grade within one week.

If you are not satisfied with the score you receive on your assignment, you may revise or rewrite it, and resubmit them for grading using the same submission form above. Keep in mind that the grade you receive on your assignment is only a portion of your overall grade for the course, and you are free to retake the proctored final exam as well if you choose. Please see the course syllabus for a more detailed breakdown of the grading policy.