CS 635 Advanced OO Design and Programming
Fall Semester, 2022
Assignment 2

San Diego State University -- This page last updated on 10/13/22
Version 1.1 (10/13) - added 3rd strategy

Due Oct 18

Implements a binary search tree with addition. You don't have to implement delete on the tree. The tree contains Student objects. A student object contains first name, last name, red id, and GPA.

You will implement the following patterns on your tree.

1. Internal iterator. The iterator accepts a lambda and evaluates the lambda on all of the elements in the tree.

2. Strategy pattern to order the tree. You will implement three strategies. One to sort by Red Id. Another is to sort by the last name and then by the first name if the two last names are equal. For the third strategy, first round the GPA to the nearest integer. Then sort by rounded GPA and when equal use Red Id.

3. Null Object pattern to add a null node to your tree to eliminate the need to check for null references or pointers in your tree.

4. Visitor pattern. Implement two visitors, One to count the number of null nodes. Another is to compute the longest path in the tree and the average path length in the tree.

Grading

Item	Percent of Grade
Working Code	20%
Unit Tests	10%
Proper implementation of Patterns	60%
Quality of Code	10%

Late Policy

An assignment turned in 1-7 days late will lose 5% of the total value of the assignment per day late. On the eighth day late, the penalty will be 40% of the assignment; on the ninth day late, the penalty will be 60%, and after the ninth day late, the penalty will be 90%. Once a solution to an assignment has been posted or discussed in class, the assignment will no longer be accepted. Late penalties are always rounded up to the next integer value.