CS 341: Advanced Data Structures
Homework #2

Milestone 1 due: January 28, 2010 (before class)
Milestone 2 due: February 2, 2010 (before class)
Milestone 3 due: February 9, 2010 (before class)

Programming Problem

Purpose:

To understand and practice the development of ADTs.

Description:

In class, you have developed a PurpleBox ADT with your team. Your job as individuals is to create an implementation for this ADT. This homework should be completed in phases.

Phase 1
Submit your ADT description and the corresponding Java interface. These should meet the requirements given in class. Only one should be submitted per group.

Phase 2
Develop a test program for your implementation based on the interface you created. This should include a test driver class which contains a main method that allows users to perform typical PurpleBox functions. It must allow testing of all required functionality (see previous handout for requirements). These tests must utilize an object of your ADT and calls appropriate methods on the ADT object. At a minimum, this should include calls to all methods that are part of your interface.

In addition, you must create a skeleton class with all the required methods. At this time, the methods may be stubbed out (not perform their required functions, but have a valid prototype and return something of the required return type). You should be able to run the test program without error, although you may not see correct operation at this point.

For phase 2, you should <u>submit your work electronically only</u> in an email to <u>nanderson@winona.edu</u> with the subject line:
      CS341 HW2 PHASE2 submission Your Name

If your subject line does not look identical to what is above (with Your Name replaced by your actual name) you may not receive credit as this is automatically filtered into the correct homework location by subject. You should submit:
-   Your .java and .class files
-   Output showing your code compiling and results from executing your test cases

In addition, you should bring to class on a thumb drive or make available electronically your .class files ONLY (do not allow your team member access to your .java implementation) on the due date. This will allow you to verify that you have truly programmed to the interface by combining your implementation with the test class implementation of your team member to determine compatibility.

Note that you will not receive a homework grade until phase three has been completed.

Phase 3

For phase 3 of this assignment, you should complete the implementation of your ADT. By the end of this phase, you should have produced an interface, an implementation of your interface, and a test class for your ADT. If possible, I suggest you utilize a graphical interface for your test class, but this is not a requirement and you will not be penalized for using a console interface.

Note that everyone in your group should utilize the same interface. You are allowed to electronically exchange with your team members the .java file <u>for the interface</u>, as well as the .class files for your implementation and test programs. *You are not allowed to exchange any other .java files in any fashion. Doing so is violation of the academic integrity policy.*

For this portion of assignment, you should <u>submit your work electronically</u> in an email to nanderson@winona.edu with the subject line:
            CS341 HW2 PHASE3 submission Your Name

If your subject line does not look identical to what is above (with Your Name replaced by your actual name) you may not receive credit as this is automatically filtered into the correct homework location by subject. You should submit:
- A UML class diagram of your system.
- Your .java and .class files
- Output showing your code compiling and results from executing your test cases
- A description of your design process and design decisions. Specifically, what factors did you consider when selecting the data structures and algorithms for your design and what did you settle on based on these factors.

For this assignment, you should also submit hardcopies.

You will be graded on the quality of your code, documentation and test cases as well as your adherence to the interface you negotiated with your team members. To receive full credit, you should meet the requirements listed, demonstrate this through your test cases, and all code should be well formatted and commented.