CS2400 Fall 2018 Project 1

Total points: 100

Due date: Wednesday, September 26, 2018

Purpose:

1. Warm up your programming skills.
2. Understand the interface and application of bags.

Task Description:

Task 1: Imagine a pile of books on your desk. Each book is so large and heavy that you can remove only the top one from the pile. You cannot remove a book from under another one. Likewise, you cannot add a book beneath another one. You can add another book to the pile only by placing it on the top of the pile.

If you represent books by their titles alone, design a class that you can use to track the books in the pile on your desk. Specify each operation by stating its purpose, by describing its parameters, and by writing a pseudocode version of its header. Then write a Java interface for the pile's methods. Please follow the code examples in our lecture slides to comment your code.

Task 2: Define a class PileOfBooks that implements the interface described in Task 1. Use a resizable array in your implementation. Then write a program that adequately demonstrates your implementation.

Task 3: Repeat Task 2, but use a chain of linked nodes instead of an array.

Task 4: Using Big Oh notation, indicate the time complexity of each method defined (in Task 2 and Task 3) in the best case and the worst case. Please provide explanations for your answers.

What to Submit?

1. Source codes for Tasks 1-3.
2. Written document for Task 4.
3. Please zip all documents as yourname_p1.zip and submit it in blackboard.

You will be graded based on the quality of your program and the correctness of your algorithm analysis.