**CS 203 HW #6: Library software design  
Fall 2012**

**Due Date:** Wednesday, March 7 at 11 am  
  
**Directions:** This homework assignment is different than the ones you have done in the past. Answer the following questions with short answers and submit your .docx file to Moodle by the due date. The purpose of this assignment is to get you thinking about object-oriented design and how to design classes in Java. *There is no Java programming required for this assignment. For question 1, include two UML class designs (example below). For questions 2 – 4, answer with a paragraph of text.*

1. [10 points] Suppose you are designing a system to manage a university library's holdings. Provide *two* different classes that you would design for this system. For each class, include at least *three* attributes and at least *three* actions associated with objects in the classes. In addition, for each attribute, provide an instance variable name for the attribute and its associated type. For each action, provide a method name, method parameters, and return types for the methods.

*Here is an example class description for* UniversityEmployee *in a university payroll system. Your two classes should have a similar format.*  
  
Class: UniversityEmployee  
  
Attribute                       Instance Variable Name Instance Variable Type  
employee's name                 name                   String  
employee's ID number            employeeID             int  
employee's direct boss     supervisor     UniversityEmployee  
salary                          annualSalary           double  
employee's subordinates         manages                UniversityEmployee[]  
  
Action             Method Name  Method Parameters    Return Type  
sets supervisor to a new boss   setBoss      newBoss: String      void (none)  
calculates and returns the

monthly salary      getMonthlySalary    none          double  
returns the employee's ID

number               getID               none           int  
  
2. [4 points] Could an object representing a *university employee* in a payroll system be used to model a *user* of a university library system? In other words, are there attributes (instance variables) and actions (methods) of a university employee in a payroll system that are not relevant for a library user? What additional attributes and actions are needed for a library user?

3. [3 points] Describe the sequence of events that must happen in the library system ***software*** when a user borrows a book from the library (checking it out for two weeks). (You may describe the actions in English -- do not worry about writing code.)  
  
4. [3 points] Describe the sequence of events that must happen in the library system ***software*** when a user searches for all books by “J.K. Rowling". In other words, what happens in the software when a user types in "J.K. Rowling" as the author and presses the "Search" button? (To answer this question, think about how the software should organize library holdings to make the search possible and efficient.)

5A. How many hours did you spend on this homework assignment?

5B. By typing your name here, you acknowledge that this work is your own.

Name your file **username\_HW6.docx**. Upload your file to Moodle.