Lab Three: Methods

Objective

The objective of this lab is to

- gain further your skill and knowledge with using Netbeans IDE;
- learn about getter and setter methods; and
- learn to access methods in other classes

What to hand in:
Submit your source code no later than Jan 31, 2016 @ 11:59pm in the dropbox.

- Lab3a:
  - Lab3a.java
  - Student.java
- Lab3b:
  - Lab3b.java
  - Book.java

Note: Late submissions will be penalized at a rate of 20% per weekday.

Marking Scheme:
Your solution be assessed based on the following:

- Code formatting
  - correct indentation
  - appropriately named variables
- Code commenting
  - author and date created
  - brief description of all methods, formatted correctly
- Correct implementation of Java classes, including:
  - followed specifications
  - lab3a
    - all errors fixed
    - all specified methods implemented
  - lab3b:
    - all methods added correctly
    - all methods work as specified
    - visibility of all members/methods correct

Note:

- Read the lab notes on methods for assistance.

Exercises

1. Download the Lab3a.zip file and open it. You will need to use *Open Project* under the *File* menu.

   Read through both files and try to understand what is happening. Note that Lab3.java contains a main method and is the main program that will be run. Try to compile both files. You will get some compiler errors. Your goal is to fix Student.java so that it is error-free. Once you have fixed the errors, you can recompile both files and run the program (make sure you are in the Lab3.java window when you try to run the program).

   There are five things that you will be required to do. For the first four items, follow the getName and setName methods as examples. Note that all of the instance variables in the class Student are declared as *private*. This means that you cannot directly access these variables from outside the class Student (for example, if you have an object of type Student named jack you cannot write jack.major). The methods, however, are all declared public.

   For each method that you add, also add the associated comment in this format:

```
/**
* description of what the method does
*
* @param the names of the parameters
* @return the return value
*/
```

   1. Fill in the code for the getMajor method in Student.java.
   2. Fill in the code for the setMajor method in Student.java.
   3. Fill in the code for the getAge method in Student.java.
   4. Fill in the code for the setAge method in Student.java.
   5. Write the code for the increaseYear method in Student.java.
      Pay attention to the method setClassYear. Write your code that you call this method from increaseYear(). Basically, no matter how many years you increase a students status, their classYear will never be greater than 4.

      Note: after you write your increaseYear method, uncomment the code at the bottom of Lab3.java to test your increaseYear method.

2. Download the Lab3b.zip file and open it. Once again you will need to use *Open Project* under the *File* menu.

You will have two files, Lab3b.java which contains the main method and some code to test the Book class (commented out). Book.java is where you will be implementing the methods.

Run Lab3b.java and you will see some errors. Why do you see errors? Because you have not yet implemented the Methods for your Book. To start, comment out the code in the main function. You can re-add it once you've implemented the appropriate Methods.

The Book class will become an object with functionality. Here you are going to implement the features of a Book. Similar to above, except this time, you will be creating the method signatures for the following:

1. A constructor that takes no parameters and sets values to a default;
2. A constructor that takes in The title and author of the book;
3. A setTitle method that accepts a String variable holding the title and returns nothing. (Use the class variable title)
4. A getTitle method that accepts nothing and returns the String variable holding the title. (return the class variable title)
5. A setAuthor method that accepts a String variable holding the author and returns nothing. (Use the class variable author)
6. A getAuthor method that accepts nothing and returns the String variable holding the author. (return the class variable author)
7. A setPages method that accepts an integer variable holding the pages and returns nothing. (Use the class variable pages)
8. A getPages method that accepts nothing and returns the integer variable holding the pages. (return the class variable pages)
9. A setPrice method that accepts a double variable holding the price and returns nothing. (Use the class variable price)
10. A getPrice method that accepts nothing and returns the double variable holding the price. (return the class variable price)
11. Add a class variable to calculate the number of times the object has been created. (hint: static)
12. Add a method to return the value of that variable.
13. Add a class variable (with appropriate visibility) that will determine what number this book is in the collection. (Hint: not static)
14. Add a method to return the value of that variable.
15. Finally, write a method to display all the variables related to the book object.

After each step I strong encourage you go back to the Lab3b.java file and test your method. To test setTitle you will need to create a Book object and then call on the method - this is started for you. Test each method as you complete them.

What to hand in:

Submit Student.java and Book.java to the dropbox