Small Assignment #3
Due: Wednesday, 2/12/2025 by 11:59 PM

Submission. Submit this as a single PDF on Gradescope. Assign pages to questions.

Encapsulation.
The next major topic for class is Encapsulation. The main principle of encapsulation is this:

It should not be possible to change an object's data without going through the object's methods.

We will be looking at different ways to achieve good encapsulation in class design, but this assignment is also meant to get you thinking about some of the issues related to encapsulation.

Question 1.
Consider the `Student.java` class.

Based on the principle of encapsulation given above, does this class achieve encapsulation? Explain your answer. If the answer is no, provide a short main method that shows that the principle is violated. Then explain how to fix the issue.

Question 2.
In `Student.java`, `age` is stored as an integer. Do you think this makes sense, or is there a better way to model someone's age? Explain your answer.

Question 3.
Consider the `StudentList1.java` class.

Based on the principle of encapsulation given above, does this class achieve encapsulation? Explain your answer. If the answer is no, provide a short main method that shows that the principle is violated. Then explain how to fix the issue.

Question 4.
It is generally good practice to hide the details of a class's implementation from the rest of the code as much as possible and for the client code to not depend on insider knowledge about the class's implementation. Take a look at the `getStudent` method in `StudentList2.java.` Is there anything about this method that reveals the details of the class's implementation and/or requires the client to know something about the object's details? How would you address this?

Question 5.
Consider the `StudentList2.java` class.

Based on the principle of encapsulation given above, does this class achieve encapsulation? Explain your answer. If the answer is no, provide a short main method that shows that the principle is violated. Then explain how to fix the issue.

Question 6.
Consider the `StudentList3.java` class.

Based on the principle of encapsulation given above, does this class achieve encapsulation? Explain your answer. If the answer is no, provide a short main method that shows that the principle is violated. Then explain how to fix the issue.

Question 7.
Are there any other details in the class definitions given in this assignment that you think should be improved? Explain what the issue is and how you would fix it.