CS 2510 Exam 1 – Spring 2012

Name: _____

Student Id (last 4 digits): _____

• Write down the answers in the space provided.
• You may use all syntax that you know from *FunJava* (that is, the parts of Java we have studied in class), although there are several features you will *not* need.
• When defining methods, you do not need to give a complete class definition—just indicate in which class your method definition should be placed.
• For tests you only need to provide the expression that computes the actual value, connecting it with an arrow to the expected value. For example `s.method() -> true` is sufficient.
• Remember that the phrase "design a class" or "design a method" means more than just providing a definition. It means to design them according to the **design recipe**. You are *not* required to provide a method template unless the problem specifically asks for one. However, be prepared to struggle if you choose to skip the template step.
• We will not answer *any* questions during the exam.

Good luck!

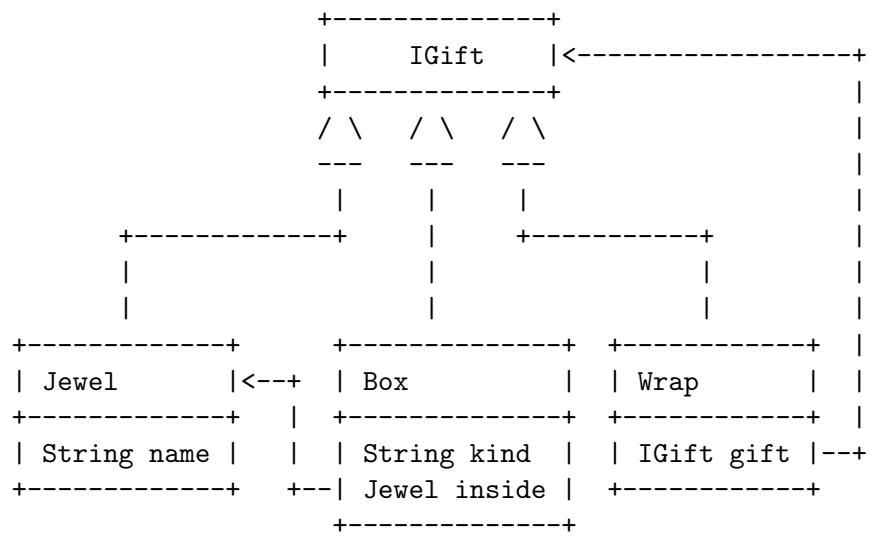
Problem	Points	/
A		/ 3
B		/ 9
C		/ 9
D		/ 9
E		/ 4
Total		/34

34 Points

Problem 1

Valentine's day is coming, so here is a nice gift you can give or receive. Of course, it needs to be in a nice box, and wrapped carefully.

Here is a class diagram that describes this gift:



A. *(3 points)*

Make examples of data (i.e., instances) for this class hierarchy. Include an example of a ruby in a red box with three wrappings around it.

B. *(9 points)*

Design a method, `size`, that computes the size of the gift represented by a `IGift`.

The size of `Jewel` is always `5`. The size of a `Box` is `8` regardless of what it contains. Each wrap contributes one to the total size.

C. *(9 points)*

Design the method `replaceBox` that produces an `IGift` wrapped in the same wrappings as this one, containing the same jewel inside but with the box replaced by the box of the given kind.

D. *(9 points)*

Design the method `sameJewelBox` that checks whether this gift contains the jewel with the given name and is inside of the box of the given kind.

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E. *(4 points)*

Show the resulting templates for the `Box` class.