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.
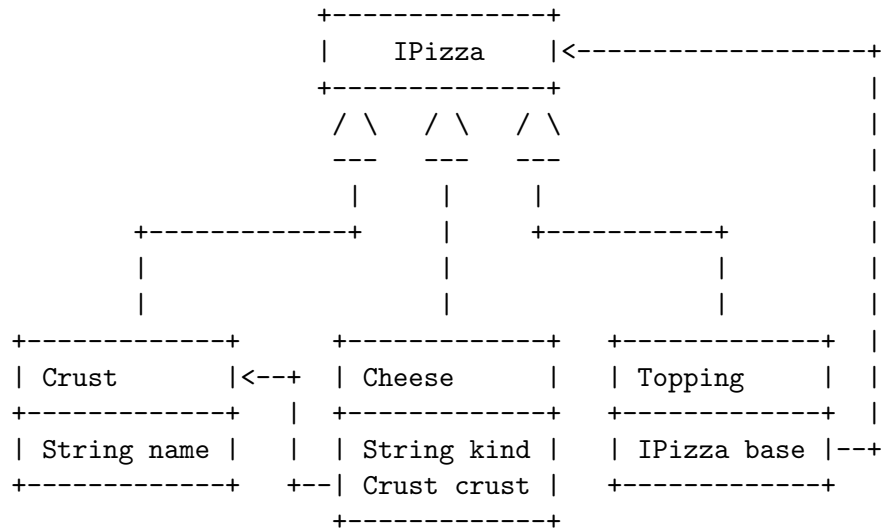
Good luck!

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

Problem 1

Tonight is another meeting of the ACM, and they always serve pizza. So, we want to know a bit about what they serve.

Here is a class diagram that describes a pizza:

```
                +--------------+
                |    IPizza    |<-------------------+
                +--------------+                    |
                  / \   / \   / \                   |
                  ---   ---   ---                   |
                   |     |     |                    |
          +------------+ |    +----------+          |
          |             |         |                 |
          |             |         |                 |
+-------------+   +-------------+  +-------------+   |
| Crust       |<--+ | Cheese      |  | Topping     | |
+-------------+   | +-------------+  +-------------+ |
| String name |   | | String kind |  | IPizza base |--+
+-------------+   +--| Crust crust |  +-------------+
                     +-------------+
```

(It may seem strange, but the toppings have no names.)

A. *(3 points)*

Make examples of data (i.e., instances) for this class hierarchy. Include an example of a thin crust pizza with mozarella cheese, and three toppings.

B. *(9 points)*

Design a method, `weight`, that computes the weight of the pizza represented by a `IPizza`.

The weight of `crust` is always 5. The weight of a `Cheese` is 3. Each topping contributes one to the total size.

C. *(9 points)*

Design the method `replaceCheese` that produces an `IPizza` with the same toppings as this one, having the same crust but with the cheese replaced by the cheese of the given kind.

D. *(9 points)*

Design the method `sameCheeseCrust` that checks whether this pizza has the crust with the given name and the cheese of the given kind.

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E. *(4 points)*

Show the resulting templates for the `Cheese` class.