

ICS 52 - Introduction to Software Engineering
Midterm Exam #2 – Fall, 2008

Last Name: _____ First Name: _____

1	2	3	4	5	Total
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1. (10 points) There are some similarities and differences between a class in Java and the Software Engineering concept of an Abstract Data Type (ADT).

Identify two similarities between Java classes and ADTs.

Identify two ways in which a valid Java class might not be a true ADT.

2. (20 points) Here's a rule of thumb: "Module interfaces should not reveal how the module is implemented."

Suppose a Java class `Student` has a method documented like this:

```
// Returns the total number of course units for the
// student that count towards graduation.
public int getUnits();
```

Does this method follow the rule of thumb, or not? Explain your reasoning.

Select a desirable software quality discussed in lecture or in the textbook, and show how following this rule leads to software possessing that quality.

3. (30 points) Congratulations! In an alternate iTunes-free universe, you have been hired as a Software Architect for a new system that will allow users to download music and videos and play them on a PC or portable device (just like iTunes and iPod in our universe). This product will be called iHum. Your boss asks you to sketch out two software architectures for iHum, using two different architectural styles (but not using Pipes and Filters, which your boss loathes). For each approach draw a diagram (not a UML class diagram) showing the iHum architecture following that style. Make sure your diagrams are clearly labeled and clearly show a high-level design for iHum using each architectural style.

Name of first style: _____

Name of second style: _____

4. (20 points) Define and contrast the terms *software architecture* and *software design*.

5. (20 points) The textbook says that high cohesion and loose coupling are desirable properties in a design and its subsequent implementation.

Why is high cohesion desirable? Your answer should be based on at least one software quality, principle, or property discussed in lecture or the textbook.

Why is loose coupling desirable? Your answer should be based on at least one software quality, principle, or property discussed in lecture or the textbook.