

CS3733-D04 Final Exam

Name:

Answer all of the questions as completely as possible. Do your own work. There is an academic honesty policy at WPI and it will be enforced. Good luck.

Part 1: Basic Knowledge

For multiple choice questions, circle all that apply.

1. (4) UML sequence diagrams and collaboration diagrams contain which of the following UML modeling elements?
 - a. Classes
 - b. Objects**
 - c. Associations
 - d. Methods**
 - e. Dependencies

2. (6) What is the main goal of class design?

To assign responsibilities to classes.

3. (4) Consider the two different styles of implementing a design: design-by-contract and defensive programming.

design-by-contract is easier to test.

defensive programming is a better style if you are building a class library for use in other applications.

4. (4) Which pattern is commonly used in GUI applications to handle the events like menu and button clicks?
 - a. Singleton
 - b. Façade
 - c. Adapter
 - d. Observer**
 - e. Iterator

5. (3) The letters C-R-C in CRC cards stand for what?

Class, Responsibility, Collaboration

6. (6) What is a design pattern?

A general, proven solution to a common problem.

7. (4) Two ways to perform integration are **phased** and **incremental**.

CS3733-D04 Final Exam

8. (5) In UML, a class is represented as a rectangle divided into up to three compartments. What are the three compartments for?
Class name, properties (or attributes), operations (or methods)
[If they say variables for the first, give them one point]
9. (5) What is the major advantage of using the Iterator pattern in your code rather than using something like a for-loop to iterate over a collection?
It hides the implementation of the actual collection.
10. (3) Which of the following are characteristics of beta software?
a. Not licensed
b. Free
c. Feature complete
d. Used for internal customers only
e. Little, or no, documentation
11. (4) Which type of UML diagram is best for representing a use case scenario?
Sequence diagram
12. (3) Which of the following are GRASP patterns?
a. Iterator
b. Creator
c. Don't Talk to Strangers
d. Adapter
e. Information Expert
13. (3) Which of the following are true about CRC cards?
a. They are not useful for experienced O-O developers
b. They describe methods and properties of classes
c. They are easy to create and destroy
d. They are a formal specification of design
e. They are an O-O design tool

Part II: Longer answers

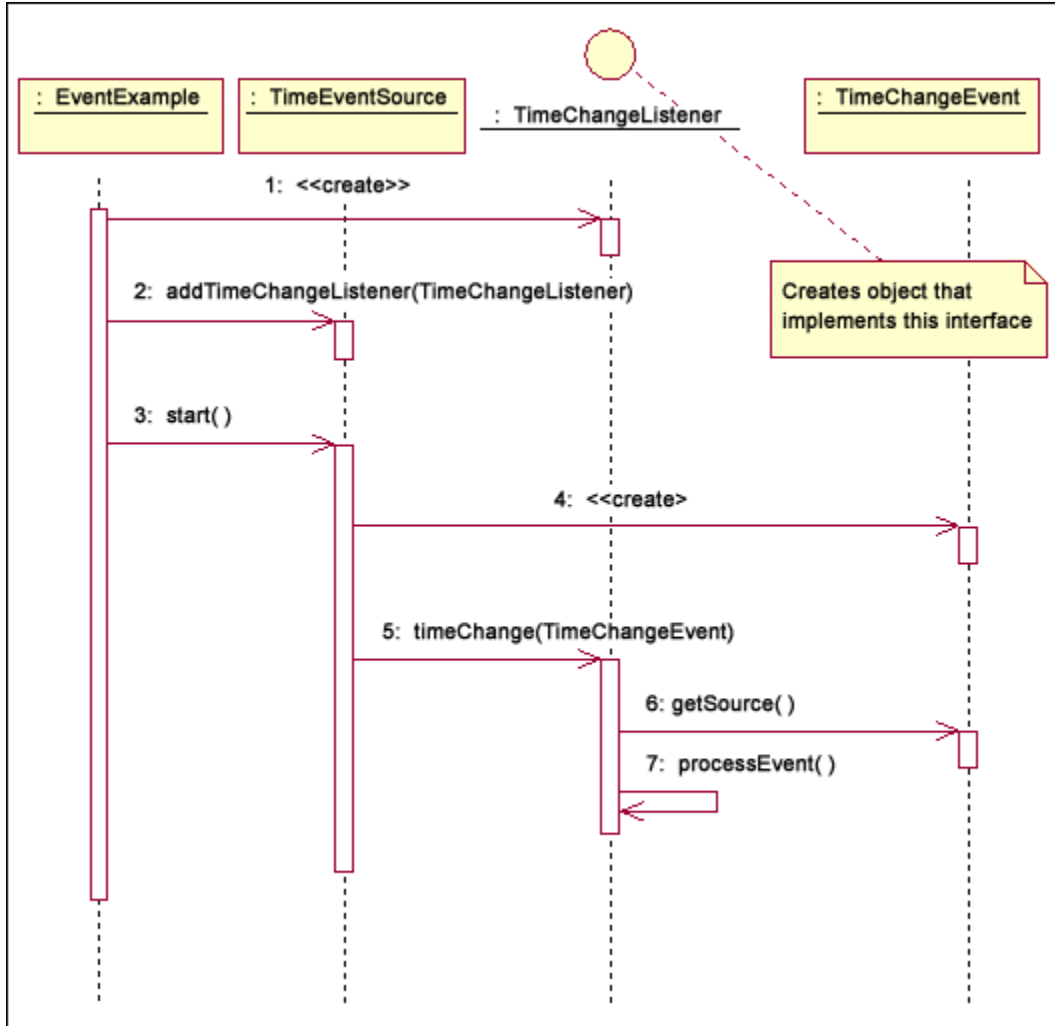
1. (15) Consider the paper *A Rational Design Process: How and Why to Fake It*. Give at least three reasons why a design process will always be an idealization. And describe *why* it is valuable to fake the process.
Any of the following reasons:
- **stakeholders don't know what they want**
 - **some information only becomes apparent as we work through the project**
 - **there are too many details to get it right in the beginning**
 - **change happens**
 - **people make mistakes**
 - **some people have preconceived ideas about the design**
 - **we try to reuse software that wasn't designed for what we need**

CS3733-D04 Final Exam

It is valuable to fake the process because we waste time trying to keep everything up-to-date and in synchronization when it's continually changing and may be wrong.

CS3733-D04 Final Exam

2. (15) Convert the diagram below to an equivalent collaboration diagram.



CS3733-D04 Final Exam

3. (15) Identify and discuss three issues that you must consider when you either license your software or use software that is licensed.
- **can I redistribute the software**
 - **can I change the source code**
 - **if I change the source code do I have to make mine public**
 - **how long do I have the license for**
 - **how many machines can I run the software on**
 - **what are my liabilities**
 - **what recourse do I have if something goes wrong**
 - **what guarantees are there**
 - **do I get upgrades**

[the above can be for either case, just change the “can I” to “can my customer”]