CS3733-B04 Final Exam Study Guide

Design

- What is architecture, in the context of software development? (It is more than structure. It includes technology and decisions that go into the system design.)
- What is the concept of layering in system architecture? Why do you use it? Give examples of a layered architecture.
- What is the client-server model of architecture? What is the three-tier model?
- What is the difference between think-client and thick-client architectures?
- If analysis deals with the problem domain, what does design deal with?
- What are the PCEMF layers that the author describes in the textbook? What goes into each layer?
- What are the 4+1 views for software architecture (see class notes for classes 17-20)?
- Given descriptions of certain classes in a 3-tier system, identify what layers (tiers) the classes go in.
- What are design patterns?
- How are design patterns different than templates?
- What are common sections of describing a design pattern?
- Be able to describe Adapter, Singleton, and Façade patterns.
- What are dependencies?
- Why are dependency cycles bad? How might you remove dependencies from a design? (See textbook)
- How do you represent a dependency in UML?

Agile Methods

- What is Extreme Programming?
- What are the main practices of XP and how are they used?
- Describe some reasons why you think XP can be useful, and in what context
- Describe some reasons why you think XP is not a viable method, and why?
- What are the four agile principles? What are two ways of interpreting the principles? (as binary values and as continuous values along a spectrum)

Testing

- What is the purpose of testing? Why do you test?
- What are the three main levels of testing? Describe each? (Unit, Integration, System)
- What are the two main methods of testing? Describe each? (Black box, white box)
- Given a situation, piece of software, describe how you would test it using black box, or white box testing.
- What is a test case?(Input, Expected Results[, actual results])
- What is exploratory testing? What are the benefits of exploratory testing?
- Be able to construct test cases for a given problem situation.
- What are boundary tests?
- Be able to identify, out of a set of test cases, which ones are redundant.
- What is path testing? How is it different than condition testing?

- Be able to count the number of tests needed for path or condition testing of specific code.

Miscellaneous

- What is CMM? How is it different from a process?
- What is ISO9000?
- Why do organizations want to be certified; either ISO or CMM certified?
- What is refactoring?
- What does it mean when someone talks about "code smells?"
- What is the difference between measure, measurement, and metric?
- Why do we measure?
- What makes something a good metric?
- Given a situation / context, describe a metric that might apply for a specific purpose? For example, if you were asked to assess the readiness of a software product for release, you might measure the rate of change of code in % lines changed / time period. You might measure the defect rate per time period and see if the trend is going down, or if it's increasing.
- What might be some good metrics for personal use? Team use? Organization use?
- According to Parnas and Clements, what is the ideal process?
- What do Parnas and Clements mean when they say that you should fake the process?
- What causes a project to be unable to follow the ideal process?