Final Exam Review

CS 446/646 ECE452
Jul 26th, 2011
Coordinates & Time

When

- Aug 2\textsuperscript{nd}, 2011 @ 12:30PM – 3:00 PM

Where

- PAC 7,8
Structure

Section 1: Multiple Choice [20]
- 20 questions (answer all)

Section 2: Design Questions [85]
- 17 design questions (answer all)
  - mostly short answers
  - 2 bit longer questions
    - Garlan & Shaw Case Study
    - Covered in class
Section 3: Bonus Questions [9]

- 4 short answer questions

Maximum possible - 100%
Topics

UML

- notation, class & sequence diagrams
- NO use cases

Design Patterns

- Singleton, Adapter, Bridge, Façade, Command, Iterator, Observer, Strategy, Composite, Visitor, Interpreter
- For each
  - intent, class diagram
  - applicability
    - given a scenario, which and why
  - discussion in the class
Topics

Software architecture styles

• basic styles
  – pipe & filter, data abstraction, implicit invocation, layered, repository, interpreter style

• for each know the
  – intent,
  – advantages & disadvantages
  – variations
  – applications

• first three case studies
Topics

Architectural types

• definition & differences
  – the role of each in the software design process

4+1 views

• for each view
  – definition & diagram
  – purpose
  – usage
Topics

Quality concerns

- functional & non-functional requirements

Enterprise web application architecture

- the different iterations (1\textsuperscript{st}, 2\textsuperscript{nd}, GWT)
- components & tiers
- connectors & protocols
- JEE design patterns
  - front controller, Intercepting Filters, Transfer Object, DAO
Enterprise web application architecture

• design considerations
  – presentation tier enhancements
    • front controller + intercepting filter
  – business tier
    • service layer with Facade and Command
  – persistence tier
    • storage neutrality using DAO & Abstract Factory
Topics

Cloud Computing

• NIST Definition
  – essential characteristics
  – deployment models
  – SPI services

• reference architecture/model

• distributed storage
  – CAP theorem (availability & consistency)
  – scaling & partitioning
  – characteristics
Topics

Cloud Computing

- distributed computing
  - map reduce
    - basic understanding
    - four examples
      - wc
      - distributed grep
      - URL access frequency
      - inverted index
Topics

Re-factoring to Patterns
- Guest lectures by Mehdi
- exercise 4*

Creativity
Another look at design

Alloy
- class activities (binary tree, river crossing)

seL4 Kernel
General Hints

Focus on

- all material discussed in class
- exercises & assignments
- extra reading

Not Included

- Ian Davis guest lecture
- architectural methodology overview