Midterm Review

CSCI 4448/5448: Object-Oriented Analysis & Design

Lecture 24

The Midterm

- On Friday 3/6 - 50 minutes – starts promptly at noon
- Two locations:
  - ECCR 150 – Undergraduates in 4448/4448B
  - Koelbel Business 218 – Graduates in 5448/5448B AND any students with exam accommodations
  - If you do have an accommodation for the exam, please e-mail me and remind me so that I can give a list of students to Manjunath
- Closed book exam, no connected devices
- You may have one 8.5 x 11 inch note paper, you can use both sides
- You may write out or type your notes (or cut and paste from lectures)
- You cannot use other people's note materials, the notes must be your own
- You will turn in your notes with the exam papers
- You will be given spare paper for scratch paper or for writing out longer answers if needed

Midterm and Quizzes

- I am not directly using quiz questions in the exam
- Having said that, I may duplicate in whole or in part questions from the quizzes as I create the exam, simply because I have a topic I want to cover
- I would look at the quizzes to identify any areas where you may have less clarity on a concept to focus your study and notes

Midterm and Class Exercises

- Much like the quizzes, I don’t plan to take anything specific directly from class exercises
- However, there are common concepts there that may come up
- I would review the class exercises with a view to identifying anything you’re not comfortable with or need notes on

Midterm and Readings

- At this point in the lecture cycle we have been following the topics in the Head First Design Patterns book
- We have covered material from Chapters 1 to 9 and 12 in that book
- I have supplemented and summarized the book materials in lectures
- I will only use the book to pull exam questions if I also covered it in a lecture

- For exam study, I suggest you refer to the book if you have questions regarding topics we reviewed that you'd like to get some clarity or examples from from the book discussions

Midterm and Lectures

- The exam questions will come primarily from the lectures, class exercises, and things we have discussed in class
- This is where I would focus studies and note taking
- The following slides will look at the lectures and topics covered in the exam

Lectures Covered on Exam

- L4 OO Paradigm
- L5 OO Fundamentals
- L9 UML
- L10 Design Patterns/Strategy
- L11 Observer
- L13 Decorator
- L14 Conceptual Modeling
  - Just CRCs if anything
- L15 Factory
- L16 Singleton, Object Pool
- L17 TDD
- L18 Command
- L19 Facade/Adapter
- L20 Horizons
- L21 Templates
- L22 Iterator/Composite
- L23 Patterns of Patterns, MVC

- Not Intros (L1-L3)
- Not Java, Python, Git (L6, L7, L8)
  - Doesn't mean I won't make you read code, but no writing
- Not Problem-Solution (L12)

UML for Class Diagrams

- Inheritance
- Multiplicity
- Association/Reference
  - Single arrows show = 1-way reference
  - No arrows or both arrows = 2 way reference
- Self-association
- Aggregation, Composition, Existence Dependency
- Qualification
- Interface (labeled class or pin/socket)
- Abstract Class (labeled)

- Other UML: Use Cases/WAVE, Sequence, State, Activity

Patterns

- Strategy
- Observer
- Decorator
- Simple Factory
- Factory
- Abstract Factory
- Singleton
- Object Pool
- Command
- Null Object
- Adapter
- Façade
- Template
- Iterator
- Composite
- MVC

- Know the patterns, their UML representations, how they're used, how to differentiate them, principles involved, etc.

Principles (we've covered so far)

1. Encapsulate what varies
2. Favor composition (or delegation) over inheritance
3. Program to interfaces, not implementations
4. Strive for loosely coupled designs between objects that interact
5. Classes should be open for extension, but closed for modification (Open/Closed Principle)
6. Depend on abstractions, do not depend on concrete types (Dependency Inversion Principle)
7. Only talk to your friends (Principle of Least Knowledge)
8. Don't call us, we'll call you (The Hollywood Principle)
9. A class should only have one reason to change

PLUS OO Basics: Abstraction, Encapsulation, Polymorphism, Inheritance

Know the principles (& basics), what they mean, how they impact designs

Exam Notes/Strategy

- There won't be coding directly, you may have to read code, you may have to write pseudo-code (need to understand actions, but exact syntax doesn't matter)
- Some questions are based on knowing definitions, some are programming related, some are on how terms relate to each other, some are essay questions where you'll need to hit points in a short answer, some are diagramming with UML

- Manage your time! X Questions in 50 minutes
- Be brief, succinct, and on point with answers – never more than a sentence or two – hit the keywords
- Skip over anything you may struggle with and knock out the easy ones

Next Steps

- New quiz up this weekend – no quiz the week of the midterm exam
- Grading continues…
  - I am starting to review semester project topics – I will leave comments, but will also contact you if I have questions
- Assignments active
  - Graduate Project Topic Peer Review paper due Fri 2/28
  - Project 3 due Mon 3/2
- Next topics: State, Proxy, Principles Review
- Exams
  - Midterm Friday 3/6 in class – see Midterm Review or Canvas for location details
  - Optional Canvas-based Final – Wednesday 5/6 1:30 to 4 PM in class ECCR 150
    - Final exam score does not affect Midterm grade
    - Final exam grade will be highest of Midterm grade and Final grade (if taken)
- Class Staff can help!
  - Bruce: Tue 4 - 5 PM and Wed 10:30 - 11:30 AM in ECOT 242
  - Manjunath: Monday 1 – 3 PM in DLC Lobby
  - Neethi: Tuesday 1 – 3 PM in DLC Lobby
  - Anirudh: By request
  - Ask for any other coverage you need