

Assignment Project Exam Help

Software Engineering Review

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Overview of today

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- 10 till 11 we'll have this talk.
- Then a little break.
- 11 till 12 we'll go through exam questions.
- Then we'll have a big break.
- Then the lab can be used for asking tutors questions, on everything and the assessed exercise.

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Overview of this talk

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- I have no idea what's in the exam.
- Really, not a clue.
- ... seriously.
- This review covers what I'd consider to be the "harder" parts of the course.
- The course was about:
 - JVM
 - Coupling and Cohesion
 - Design Patterns
 - Testing
 - (Am I missing anything?)

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Coupling and cohesion

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- Coupling and cohesion are two software quality metrics, and are somewhat related. It wouldn't be too hard to write an exam question on coupling and cohesion:

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- You can show you've *learned* the types of coupling and cohesion in the book.
 - You can *apply* your knowledge to spot coupling and cohesion in the wild.
- They're also common job interview questions for some companies.

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What is coupling?

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- A measure of interdependence between modules and routines in a software system.
- Can you name different types of coupling? You've seen at least a few in the labs.

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What is coupling?

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- The book says there are the following types of coupling:

- Content

- Common

- Control

- Stamp

- Data

- Routine call

- Inclusion/Import

- External

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What is cohesion?

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- A measure of how well elements inside a module “belong together”.
- Can you name different types of cohesion? You’ve also seen at least a few in the labs.

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What is cohesion?

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- The book says there are the following types of cohesion:

- Functional

- Layer

- Communicational

- Sequential

- Procedural

- Temporal

- Utility

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Describe cohesion

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- <https://powcoder.com>
- Name a type of cohesion that facilitates code reuse.

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Compare types of cohesion

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- <https://powcoder.com> What is the difference between Sequential Cohesion and Procedural Cohesion? In what way are they similar?

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Design Patterns

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- Design patterns are a key part of “lower level” software engineering, and it’s easy to write exam questions about them.

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- You can show you’ve *learned* the patterns in the book.
- You can *apply* your knowledge to a given problem.
- You can *contrast* and *evaluate* different design patterns and solutions.

- They’re also common job interview questions for some companies.

What is a Design Pattern?

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- Two of the elements that make up a design pattern are a name, and a list of related patterns. What are the other elements?
- Why is each element important?

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What is a Design Pattern?

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- The book says:

- Name

- Context

- Problem

- Forces

- Solution

- Antipatterns

- Related patterns

- References

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Describe a Design Pattern

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- <https://powcoder.com>
- Describe the Composite / General Hierarchy pattern.
- Give an example of when you might use it.

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What are Patterns Good For?

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- <https://powcoder.com> Name three patterns that facilitate code reuse. Briefly justify your answers.

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Compare Two Patterns

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■ <https://powcoder.com>
What is the difference between an Adapter and a Proxy?

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Apply a Design Pattern

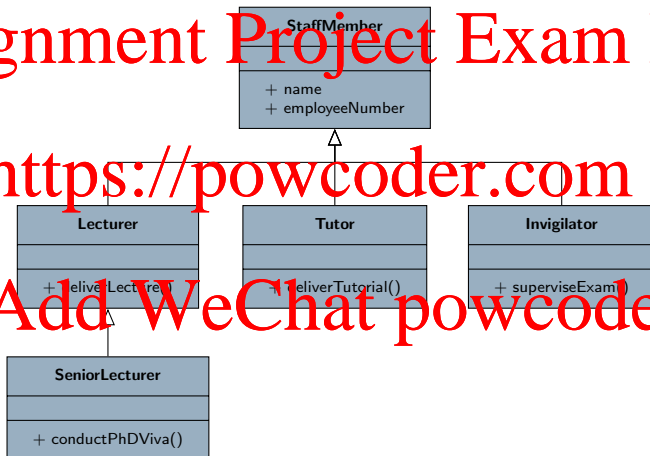
- We are modelling staff members in a University.
- All staff members have a name and an employee number.
- Some staff members may be Lecturers. A Lecturer may run a course, and only a Lecturer may do this.
- Some Lecturers may be Senior Lecturers. A Senior Lecturer may conduct a PhD viva, and only a Senior Lecturer may do this.
- Some staff members may be tutors. A Tutor may deliver a tutorial, and only a Tutor may do this.
- Some staff members may be Invigilators. An Invigilator may supervise an exam, and only an Invigilator may do this.

Apply a Design Pattern

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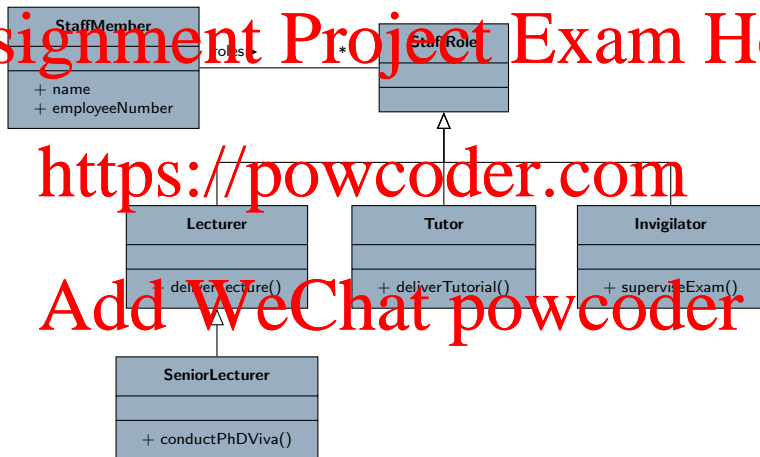
Apply a Design Pattern

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- But a staff member may be more than one of a Lecturer, a Tutor and an Invigilator. Staff members may also take on extra duties over the course of their careers. . .

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Apply a Design Pattern



Deliberately Awkward Interview Question

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- Also, some staff can be First Aid Officers. First Aid Officers can give first aid, and only First Aid Officers may do so.

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Deliberately Awkward Interview Question

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- Also, some staff can be First Aid Officers. First Aid Officers can give first aid, and only First Aid Officers may do so.
- Some staff members who are both Lecturers and First Aid Officers may be Field Trip Leaders. Field Trip Leaders can lead a field trip, and only Field Trip Leaders may do so.

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And all the stuff I left out...

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- Please don't think I'm suggesting this be the extent of your revision
- If I've missed out something you really hoped would be covered come talk to me in the lab.

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