Learning Guide Unit 3

Reading Assignment

As you go through the readings and watch the videos, consider the following:

1. How do cohesion and coupling impact the design of software systems, and why is achieving high cohesion and low coupling essential in software development?
2. Compare and contrast any two software architecture patterns discussed in this unit, highlighting their strengths, weaknesses, and suitable use cases.

Read:

1. Letaw, L. (2024). *Handbook of software engineering methods.* Oregon State University. Licensed under CC. 4.0. https://open.oregonstate.education/setextbook/

- Read Chapter 4: Unified Modeling Language Class and Sequence Diagrams (pp. 48 - 71)
  - This chapter introduces Unified Modeling Language (UML) Class and Sequence Diagrams, essential tools for modeling the structure and behavior of software systems. Class diagrams represent the static structure, including classes, attributes, and relationships, while sequence diagrams illustrate dynamic interactions between objects over time. Together, they provide a comprehensive view of system design, ensuring clarity and precision in software development.
- Read Chapter 5: Monolith versus Micro service Architectures (pp.74 till pp. 80)
  - Monolith and microservices are two contrasting architectural styles for building software systems. Monolithic architecture consolidates all components into a single, unified application, making it simpler but less flexible for scaling or updating individual features. In contrast, microservices architecture divides the system into independent, loosely coupled services, each focusing on a specific functionality, enabling scalability and adaptability.

Additional Watch:

1. TutorialsPoint. (2018, May 9). *Software Design Levels* [Video].

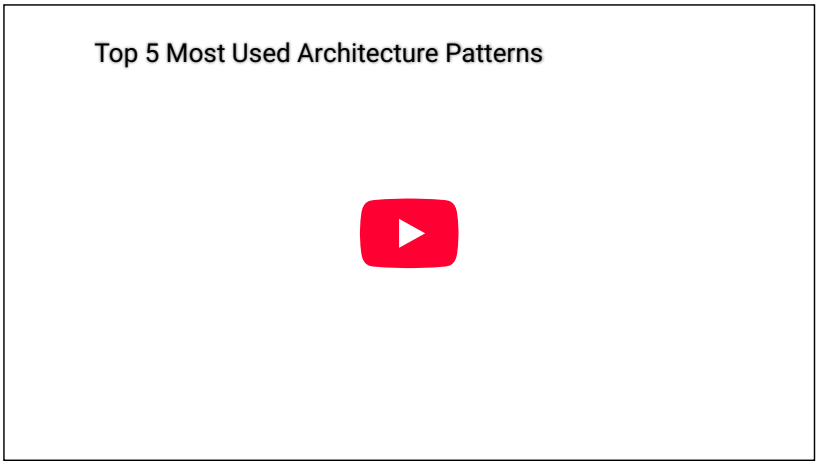
- This video explores the hierarchical levels of software design, including architectural design, high-level design, and detailed design. It explains their roles in defining system structure, module interactions, and specific implementation details

2. QuiCap. (2021, March 15). *Coupling vs Cohesion Explained* | QuiCap [Video].

- This video provides a clear explanation of coupling and cohesion, two fundamental concepts in software engineering. It highlights their differences, demonstrates how they impact software design, and offers practical examples

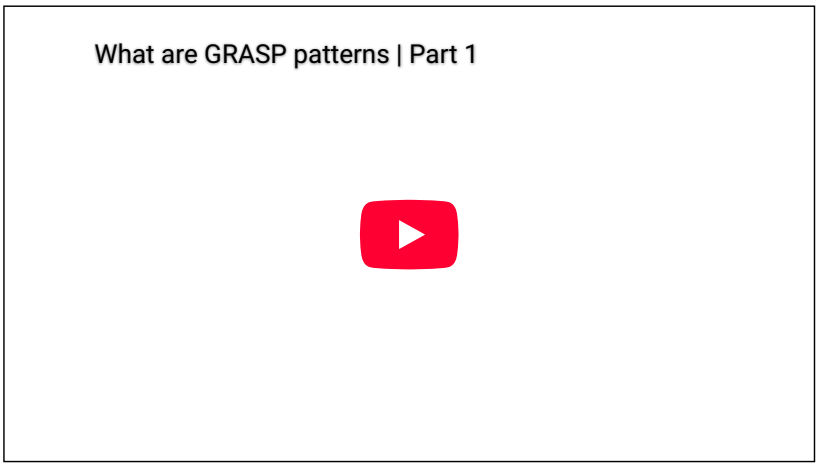
3. ByteByteGo. (2023, August 31). *Top 5 Most Used Architecture Patterns* [Video].

- This video explores the top 5 most commonly used architecture patterns in software design, highlighting their key features, advantages, and typical use cases. It provides a clear overview of patterns like Layered, Microservices, and Event-Driven Architectures, helping viewers understand their practical applications.



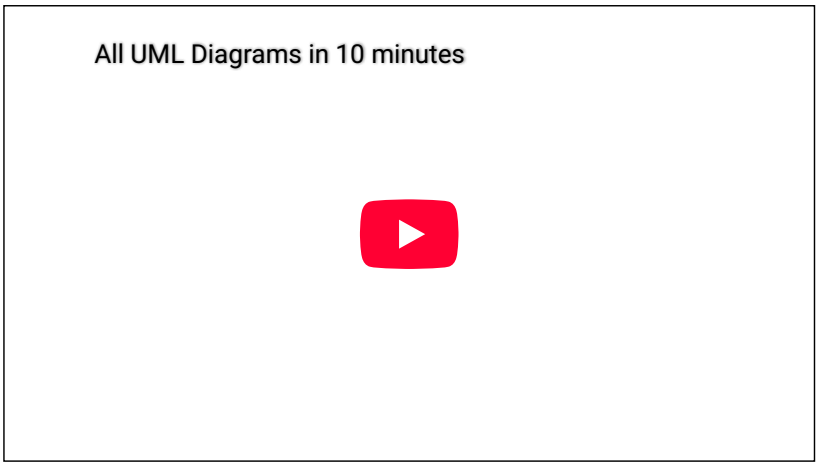
4. Coding Together ENG. (2023, August 31). *What are GRASP patterns* | Part 1 [Video].

- This video introduces GRASP (General Responsibility Assignment Software Patterns), a set of design principles for assigning responsibilities in object-oriented software.



5. Ave Coders. (2021, April 16). All UML Diagrams in 10 minutes [Video]. YouTube.

- This video provides a concise overview of all UML (Unified Modeling Language) diagrams in just 10 minutes, covering key diagram types such as use case, class, sequence, and activity diagrams.


All UML Diagrams in 10 minutes