26 Lecture - CS504

Important Subjective

Q: What are design patterns in software development? **A**: Design patterns are reusable solutions to common software design problems that provide proven approaches to address specific challenges. **Q: How do design patterns contribute to software development?** **A**: Design patterns improve code maintainability, flexibility, and scalability by promoting best practices and standard solutions to common problems. **Q: Give an example of a creational design pattern.** **A**: An example of a creational design pattern is the Singleton pattern, which ensures a class has only one instance throughout the application. **Q: How does the Observer pattern promote loose coupling between objects?** **A**: The Observer pattern allows subjects (observed objects) to notify multiple observers (listeners) without knowing their specifics, achieving loose coupling. **Q: What is the purpose of the Factory Method pattern?** **A**: The Factory Method pattern delegates the responsibility of object creation to a factory class, allowing clients to create objects without specifying the exact class. **Q: How does the Strategy pattern enable dynamically changing behaviors?** **A**: The Strategy pattern encapsulates interchangeable algorithms, allowing clients to switch between different strategies at runtime, thus enabling dynamic behavior changes. **Q: Provide an example where the Facade pattern simplifies a complex subsystem.** **A**: In a multimedia player, the Facade pattern provides a simple interface to interact with various subsystems like audio, video, and playlist management. **Q: How does the Chain of Responsibility pattern work?** **A**: The Chain of Responsibility pattern creates a chain of interconnected handlers, where each handler processes a request and passes it to the next handler until it's handled or reaches the end of the chain. **Q: Explain the role of the Decorator pattern in software design.** **A**: The Decorator pattern allows adding new functionalities to objects dynamically without modifying their structure, enhancing flexibility and promoting code reuse. **Q: What advantage does using design patterns offer to software developers?** **A**: Design patterns simplify the design process, enhance code readability, and promote best practices, making it easier for developers to build robust and maintainable software.