Software Design & Architecture

Minimap of Topics

- Clean Code
- Programming Paradigms
- Object Oriented Programming
- Design Principles
- Design Patterns
- Architectural Principles
- Architectural Styles
- Architectural Patterns
- Enterprise Patterns

Find the interactive version of this roadmap and more roadmaps at

roadmap.sh

Also visit Khalil's guide covering how to learn Software Design & Architecture

Software Design and Architecture

Backend Developer Roadmap

Clean Code Principles

- Be consistent
- Meaningful names over comments
- Indentation and Code Style
- Keep methods / classes / files small
- Pure functions
- Minimize cyclomatic complexity
- Avoid passing nulls, booleans
- Keep framework code distant
- Use correct constructs
- Tests should be fast and independent
- Organize code by actor it belongs to
- Command query separation
- Keep it simple and refactor often

Programming Paradigms

- Structured Programming
- Functional Programming
- Object Oriented Programming

Object Oriented Programming

Primary Principles

- Inheritance
- Polymorphism
- Abstraction
- Encapsulation

Paradigm Features

- Abstract Classes
- Concrete Classes
- Scope / Visibility
- Interfaces

Model-Driven Design

- Domain Models
- Anemic Models
- Domain Language
- Class Variants
- Layered Architectures

Design Principles

- SOLID
- DRY
- YAGNI
- Law of Demeter
- Tell, don't ask
- Hollywood Principle
- Composition over Inheritance
- Encapsulate what varies
- Program against abstractions

Design Patterns

- GoF Design Patterns
- PoSA Patterns

Architectural Styles

- Component-Based
- Monolithic
- Layered
- Structural
- Event-Driven
- Client-Server
- Publish-Subscribe
- Peer-to-Peer
- Messaging
- Distributed

Architectural Principles

- Component Principles
- Policy vs Detail
- Coupling and Cohesion
- Boundaries

Architectural Patterns

- Domain-Driven Design
- Model-View Controller
- Microservices
- Blackboard Pattern
- Microkernel
- Serverless Architecture
- Message Queues / Streams
- Event Sourcing
- SOA
- CQRS

Enterprise Patterns

- DTOs
- Identity Maps
- Usecases
- Repositories
- Mappers
- Transaction Script
- Commands / Queries
- Value Objects
- Domain Models
- Entities
- ORMs

Continue learning with following roadmaps

Backend

System Design