

Low-level Design (LLD)

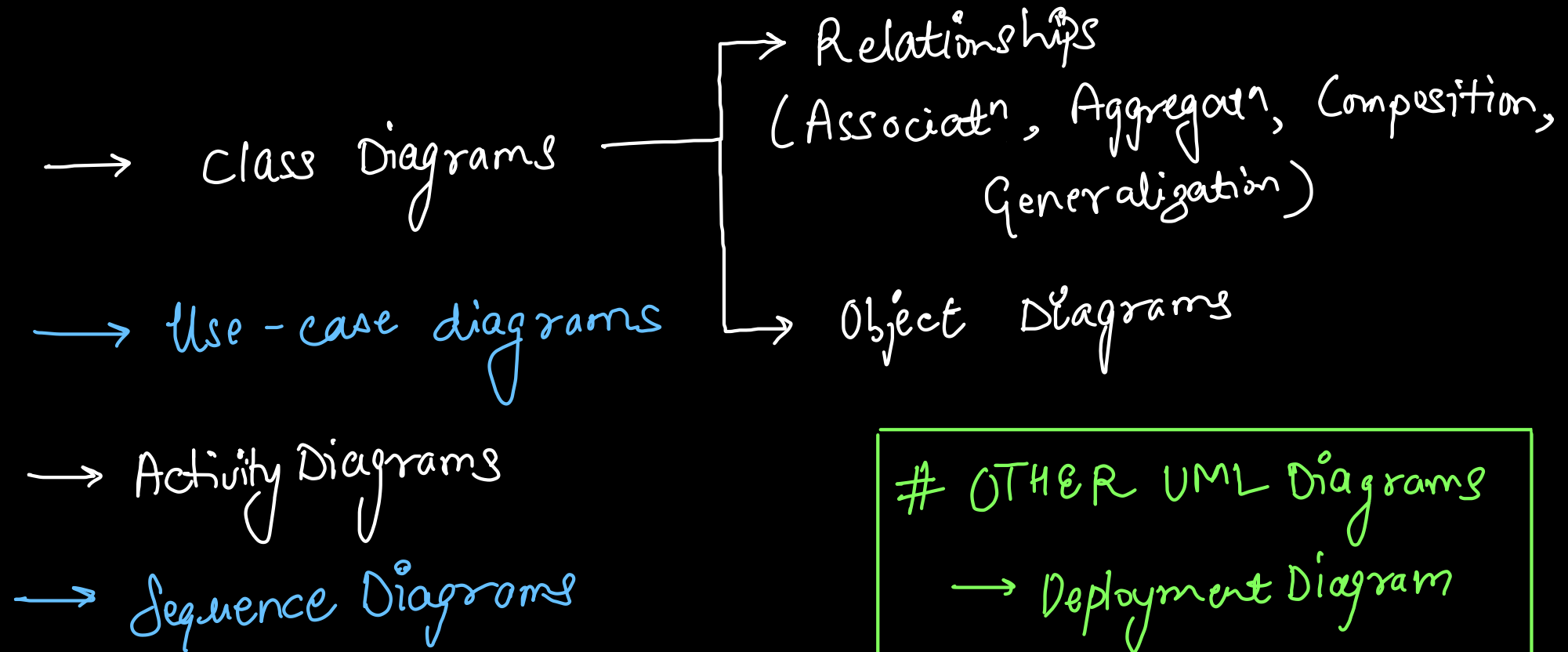
Object Oriented Analysis & Design (OOAD)

Syllabus

① Object Oriented Programming in Java

- 5 Pillars { Encapsulation, Data Hiding, Inheritance, Polymorphism, Abstraction }
- Packages, Exception Handling, Multithreading - Concurrency, Generics & Collection Frameworks, Lambda Expression & Enums

② Unified modelling language (UML) Diagram



OTHER UML Diagrams

→ Deployment Diagram

→ Component Diagram

→ State Chart Diagram

③ Design Principles

⇒ Important Design Principles

- DRY (Don't Repeat Yourself)
- KISS (Keep It Simple Stupid)
- YAGNI (You Ain't Gonna Need It)
- CQS (Command - Query Separation)
- Maximum Cohesion & Minimum Coupling
- Composition (hasA) over Inheritance (isA)

SOLID Design Principles

- (S) : Single Responsibility Principle
- (O) : Open-Closed Principle
- (L) : Liskov Substitution Principle
- (I) : Interface Segregation Principle
- (D) : Dependency Inversion Principle

⇒ Other Design Principles

- Curly's Law
- Boy Scout's Law
- Murphy's Law
- Avoid Premature Optimizatiⁿ
- Law of Perimeter

④ Design Patterns (in Java)

1. Strategy
2. Observer
3. Decorator
4. Factory
5. Singleton
6. Command
7. Adapter
8. Facade
9. Template Method
10. Iterator
11. Composite
12. State
13. Proxy
14. Compound
15. Bridge
16. Builder
17. Chain of Responsibility
18. Flyweight
19. Interpreter
20. Mediator
21. Memento
22. Prototype
23. Visitor

⑤ Case Studies (+ Machine Coding Round)

- Design Parking Lot
- Design ATM
- Design Lift System
- Design Chess Game

→ Intermediate

- Design Movie Ticket Booking System (BookMyShow)
- Design E-commerce Platform (Amazon)
- Design Social Media Platform (Instagram / Facebook)
- Design Chat Application (WhatsApp)
- Design Video Streaming Application (Youtube / Hotstar)
- Design Ride Sharing Platform (Uber / Ola)

More Design Problems

- Design Zomato
- Design LinkedIn
- Design TikTok
- Design Tinder
- Design Splitwise

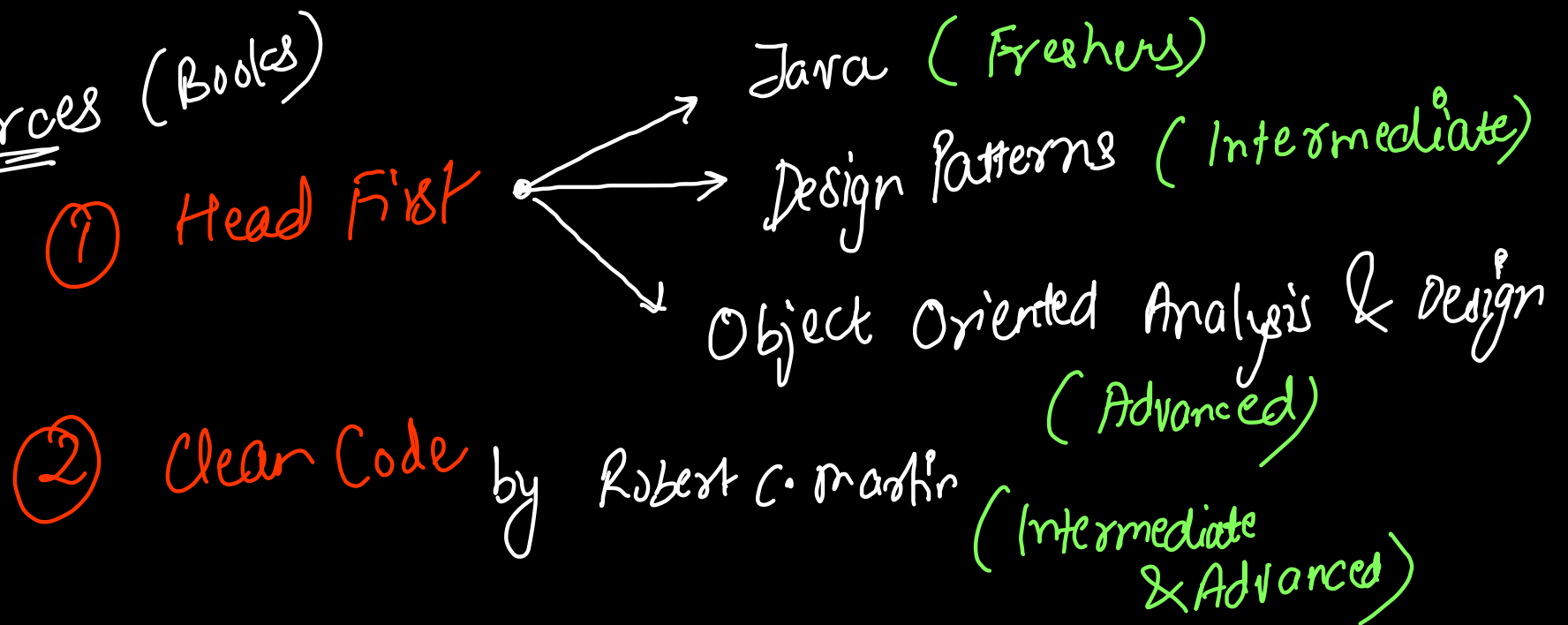
→ Advanced

⑥ End to End Project

Docker + Kubernetes + Prometheus/Grafana
⇒ monitoring service

Resources (Books)

① Head First



② Clean Code

by Robert C. Martin

(Intermediate & Advanced)

Educative
Courses

1) Cracking the System Design Interview :- HLD

2) Cracking the Object Oriented Design Interview :- LHD

UML

↳ GeeksforGeeks Low Level Design

Gaurav
Sen

→ Youtube → HLD (free 20-25 lectures)

LHD Course Not recommended