Day 1: Introduction to LLD and OOP

→ System Design

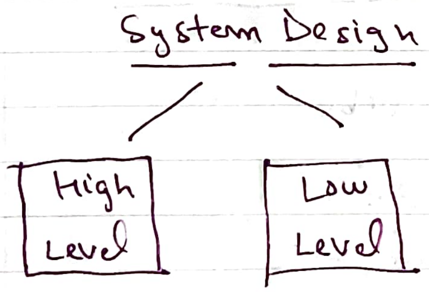
- HLD
- LLD

→ Good software
→ Paradigms (Programmings)

- Procedural
- OOP

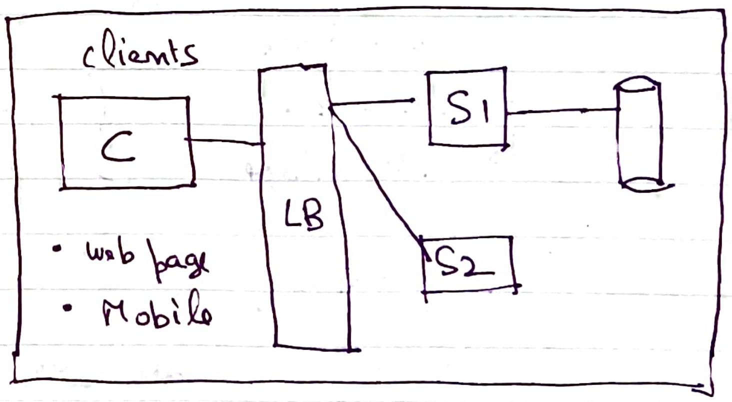
→ OOPS

- Abstraction
- Encapsulation.



→ superficially
→ overview
→ breath level.

Architecture



Implementation

→ Structure
→ classes
→ Interactions
→ Design Patterns

LLD

→ Implementation
→ organisation.
→ Good software.

$$\begin{tikzcd}
 & \boxed{\text{Interview}} \arrow[r] \arrow[dl] \arrow[dr] & \boxed{\text{Theory}} \\
\boxed{\text{Design}} \arrow[d] & & \boxed{\text{Machine coding}} \\
\text{class Diagram} & &
\end{tikzcd}$$

→ class ⟶ Design
Diagram ⟶ Implementation.

Good software

→ Maintainable
→ Scalable
→ Extensible

} Sonarqube

Linters

- eslint - Js
- block - python.

Maintable

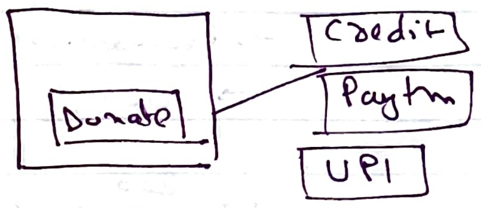
→ easy to understand.
→ easy to change
→ easy to debug.

Scalable

1. Performance
   - handle users.

Factorial → 1 minute ✗
→ 1 seconds ✗
→ $\boxed{\text{200ms}}$ ✓

Extensibility



$\boxed{\text{AWS}}$ ✗

$\boxed{\text{AliYun}}$ ✓

$\boxed{\text{Future Proof}}$

$\boxed{\text{Terraform}}$

Program Paradigms

Python vs SQL

Python

→ Set a = 1
→ Set b = 2
→ c = a+b

→ series of steps to operations

↓

$\boxed{\text{Imperative}}$

↓

→ Python
→ C, C++
→ JS
→ Java

SQL

↓

$\boxed{\text{Get all users}}$

SELECT * FROM USERS;

How to get final value

↓

$\boxed{\text{Declarative}}$

→ SQL
→ HTML
→ React

```
<Button>
click
</Button>
```

· jsx

Imperative

→ Procedural

→ OOP

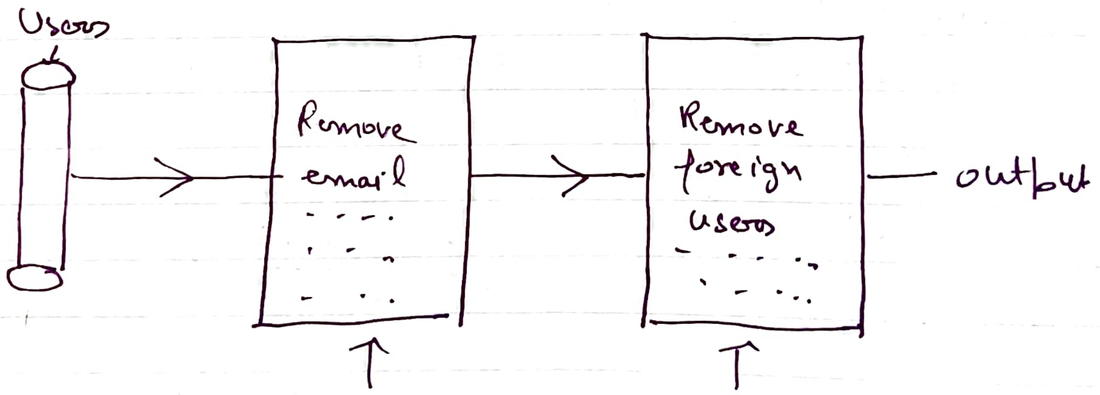
Alice $\xrightarrow{200}$ Bob.

1) Open alice account
2) withdraw 500 from Alice
3) Open bob account
4) Credit 500 to Bob.

Programming

① State — Data }
② Behaviour — Logic }

Procedural — State and behaviour are kept separate.



Advantage

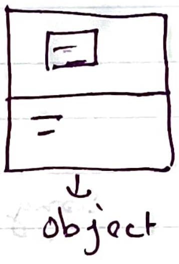
1) Easy
2) Modular
3) state decouple ✓ Behaviour.

Disadvantage

1. State is not shared.
2. Extensible
3. Security — e2e.

OOP

Car
- wheels } State
- horn
- drive } → behaviour.
- honk



Account
id name balance
- trasfer - credit - debit

id, name, balance → state.

trasfer, credit, debit] → behaviour

Advantage
- → Maintainable,
- → Reusable
- → Extensible.
- → Security.

Disadvantage
- → Pre-step of Design.
- → complex.