How to approach design Problems & Design a Pen

[Will start at 9:10PM]

Agenda

1. Types of LLD interviews
2. How to approach LLD interviews
3. Design a Pen

Amazon

Types of LLD Interviews

Theoretical

Already Prepared

- Old Tech Companies (Big MNCs / Banks)
- Non-cool / Mid Tier
- Knowledge Test
- Theoretical q^ns
  - ↳ OOP
  - ↳ SOLID
  - ↳ Design Patterns

Design

- Problem Solving Rounds / Case Studies
- "Build PayTM"
  "Build Twitter"
  "Build BMS"
- 45 mins / 1 q^n
- Write code but again not a

Machine Coding

[Most common in Startups]

- Most comprehensive LLD Rounds
- Design + Impl Skills
- 2.5 hrs
- Problem Solving Rounds.
- Simulate real env

→ 30–45 mins | 3–4 q^n |

→ NO code or even at max just small stub not the q^n asked.

→ Not even in IDE

→ just paper (just to check your knowledge of syntax

remaining code.

On Paper / Text Editor

↳ code of classes you mentioned.

→ Main focus is on your design skills, not impl

↓

→ Class Diagram

→ API Design

→ Schema Design

→ Amazon | MNT | Apple

→ Come up with complete working code

(end to end)

→ Not OI

→ FK | Cred | Curefit | Meesho | Scaler | Myntra

→ first round as MC

→ Google, FB ~~X any LLD q^n~~

→ Only HLD q^n

Design and Machine Coding Round

→ test how will you work in day to day SWE exp

Design

→ 45 mins

→ Given a one-liner problem statement
"design Grid"
"design BMS"
"design PayTM"

MC Round

→ 2.5 hrs

→ Given a detailed set of req just like how a PM may give in a real company

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① Gather Req
② Clarifying Req
↳ ask doubts
↳ corner cases.
③ Class Diagram
④ Schema design.
⑤ Write code / answer followup

① Clarifying Req
② Class Diag
③ Schema Design
} 30 Mins

④ end to end. Working Code — 1-2 hrs
⑤ Followup q^n

30 Mins

leaves call here

→ any IDE
→ any f/w
→ help from internet

Ask this to interviewer } Test cases ⇒ Most don't
⇒ Some do (GoJek)

→ No FE
→ command line i/p / Postman etc

HOW WILL WE LEARN AT SCALER

1. Single line Problem Statement
2. Gather Req
3. Clarify Req
4. Class Diagram
5. Schema Design
6. end to end code

MC Round: 1, 2, 3, 4, 5, 6

Design Round: 2, 3, 4, 5

{ BMS: for class ⇒ 2 Req
M/W ⇒ other 4-6 Req }

→ HOW TO APPROACH EACH STEP OF AN LLD PROBLEM

↳ + practice on "Design a Pen"

"Design a Pen"

Step-0: Overview

→ initial alignment

→ you and interviewer should be thinking of same problem statement

Overview

→ You already know about system

① align yourself with the expectation that interviewer has.

→ tell what you know

→ & you are correct

You don't already know about the system

① be humble to ask

② only ask overview

③ i/v shouldn't feel you are gathering req from him

End goals of overview phase.

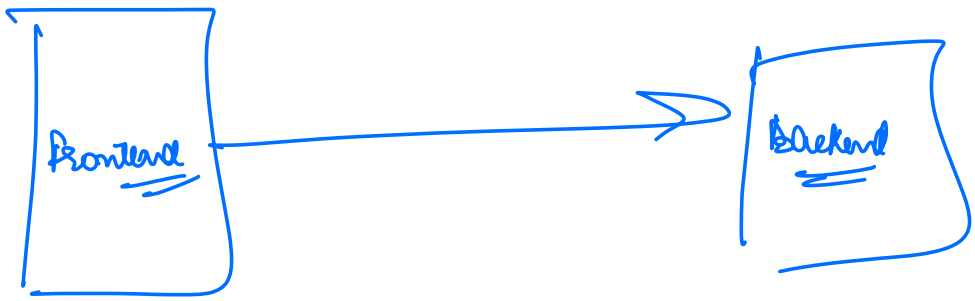
1. what system / entity does an interviewer exactly want me to design.
   - → entity → Class diagram
   - → S/W system → CD, SD

2. do I need to persist data (list/Maps)
   - → will I save in memory
   - or will I need to save in (MySQL) Real DB.
     - → Book My Show
     - → Parking lot

Only if a S/W System and impl is needed

3. how does someone interact with the system
   - → API
   - → command line
   - → Hard coded. → main() {

→ Do you just want me to design entities around X or want to build an X Nput system?



Overview (0) Problem Statement

(1) What kind of design
↳ entity
↳ real system

(2) Persistence

(3) How to take input

(2) Gathering and Clarifying Req

→ immediately ask follow up q^n for a given req.

(image of that in your mind) (a) In overview phase, build a visualization of that system in your mind. so that you are able to think of req around them.

→ suggesting idea with rationale behind them,

→ you should always be leading the interview.

(b) 5-8 core features

(c) Jot down the diff requirements

→ ability to book ticket

→ ability to list movie

→ ability to cancel ticket

Requirements of Pen

1. ability to change refil of Pen.
2. Pen can have diff color.
3. Pens may be closed in diff ways:
   → clicking or cap
4. Support diff types: Ball, Gel, Fountain.
5. Pens have typical attr: grip, refil, nib
6. Store common data about pen:
   material, name, brand, price etc.
7. Pen will have Nib

(8) Diff refil for Ball, Gel pens.

(9) Info about Refil in a pen: Gel and Ball

⇒ Can Sketch pen / marker be considered as pen

⇒ What classifies as a Pen:

→ Anything that can write

→ Some restricting thing

→ ability to change refil for Pen that support that behaviour

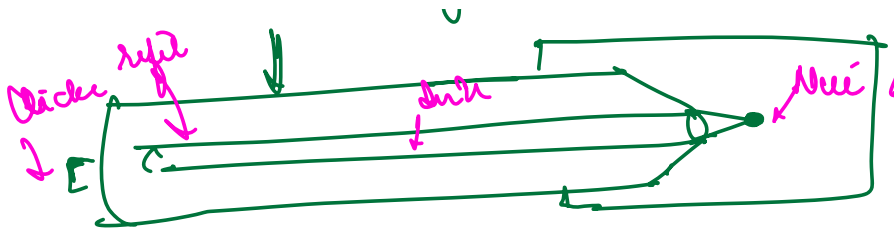
CLASS DIAGRAM

How

⇒ [(1) Visualization] Flow Chart

↓ Requirement (Entity)

↓ Parking Lot



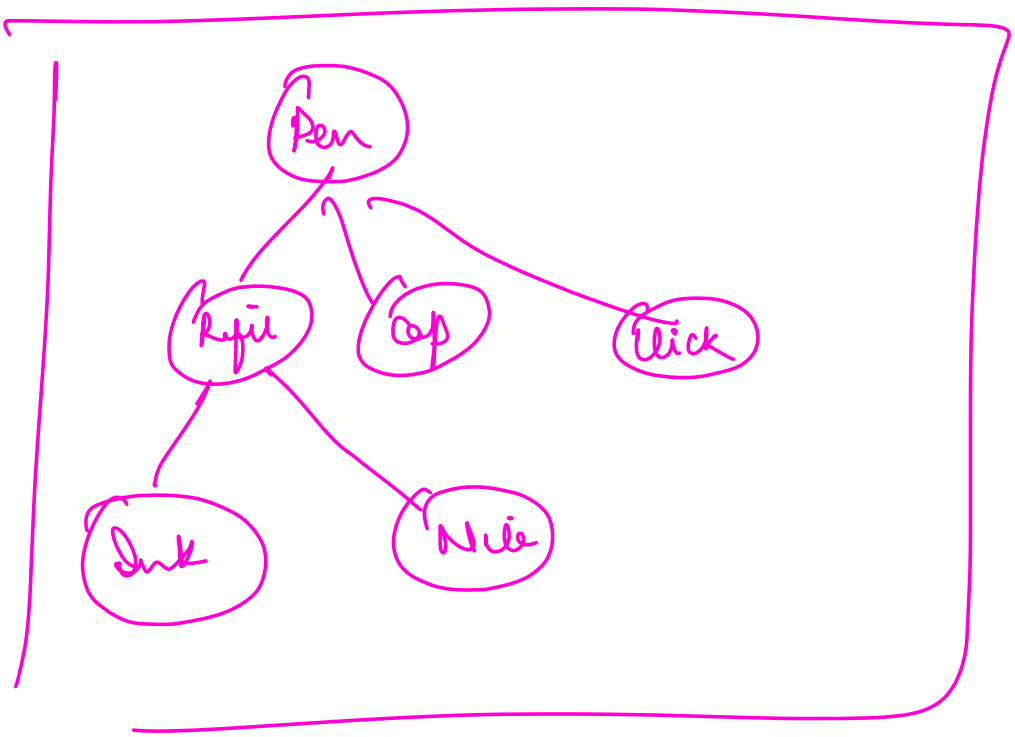
Pen

Create classes outside to inside

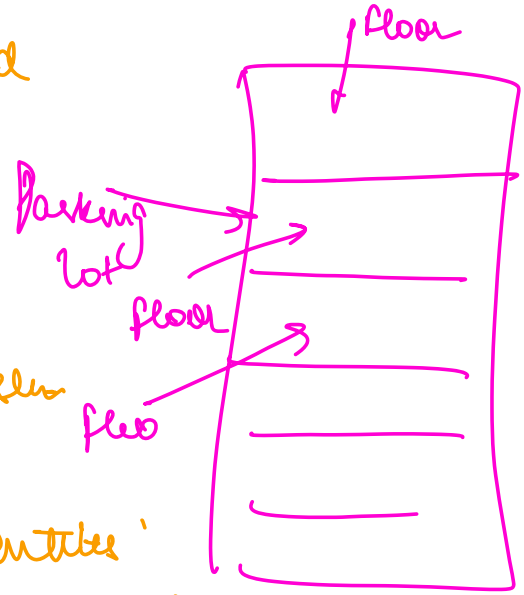
② By finding out all nouns in your requirements.

90% of nouns in your req ⇒ class

(Splitting)



① you are not expected to come up with all classes that will actually be there when you implement the system



② Expectation are :

a.) Classes for all entities

b) wherever there is a possibility design patterns that will be needed.

Monday :→ (Comp V/S Aggregation)
→ Class diag of Per

H/W Befor TTT Class → Wednesday

→ Strategy
→ Practical factory
→ Builder

→ Adapter.

new ChocoScoop( )

```
class ChocoScoop {
    ChocoScoop (IceCream cream) {

    }

}
```

~~new ChocoScoop();~~