

Agenda

Design a parking lot

start @ 9:05pm

Parking Lot (Frequent Interview Problem)

Overview

→ Know / Don't know

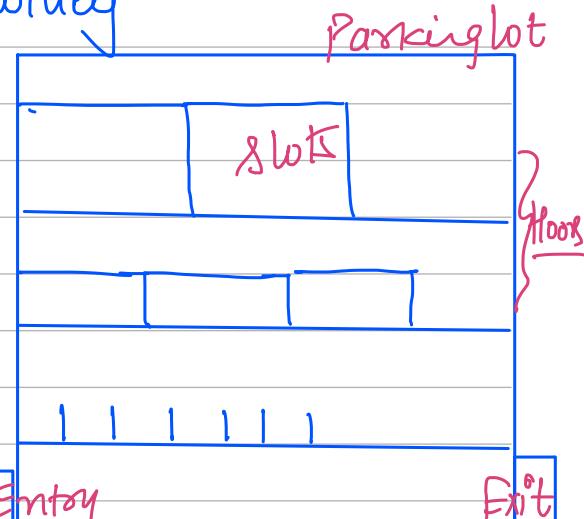
Design a parking lot management system for public parking lots for eg Airports, Malls, etc

It will be an interactive system. User will interact via APIs

Requirement Gathering

→ Visualize the system

→ Visualize the user journey

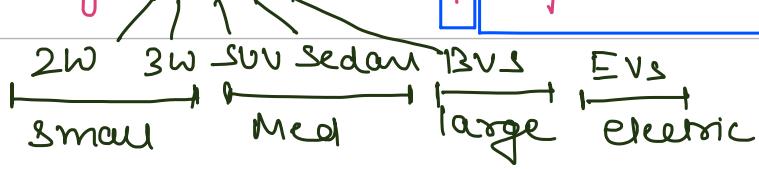


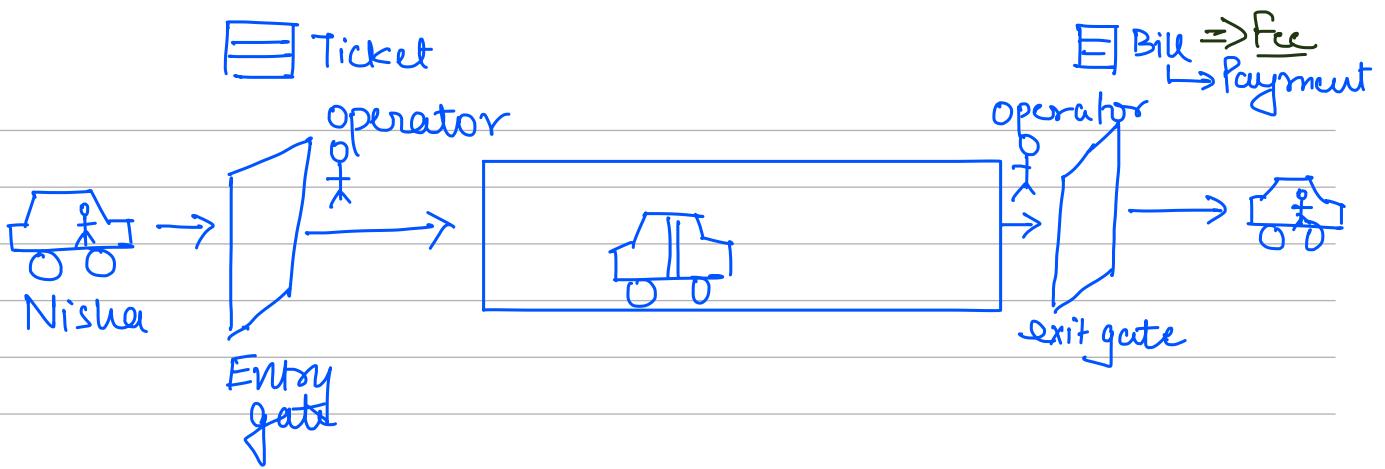
1) Multiple floors

2) Multiple Entry / Exit gates

3) Multiple slots

4) Multiple types of Vehicles



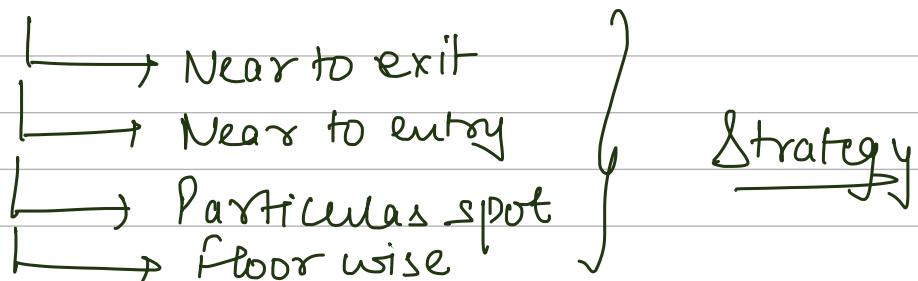


- 5) At the entry gate, ticket will be generated
- 6) Spot assignment at entry gate
- 7) There is a operator. Operator details will be stored
- 8) A Bill will be generated at exit gate
- 9) Payment will happen at exit gate
- 10) User can pay via cash / online (UPI, CC, DC - -)
↳ (Razorpay) GPay - -
- 11) Ticket should contain vehicle info, time, etc
- 12) Electric vehicles parking spot is also supported.

Clarify Requirements

- 1) Spot assignment based on vehicle type

Can be done in multiple ways



2) fee calculation \Rightarrow Multiple ways

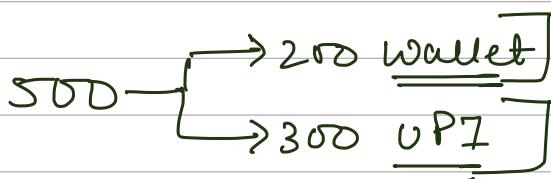
↳ charges per hour

$$\begin{cases} \checkmark 0-5 \Rightarrow 50 \text{ Rs/hr} \\ \checkmark 6-12 \Rightarrow 70 \text{ Rs/hr} \end{cases}$$

Strategy

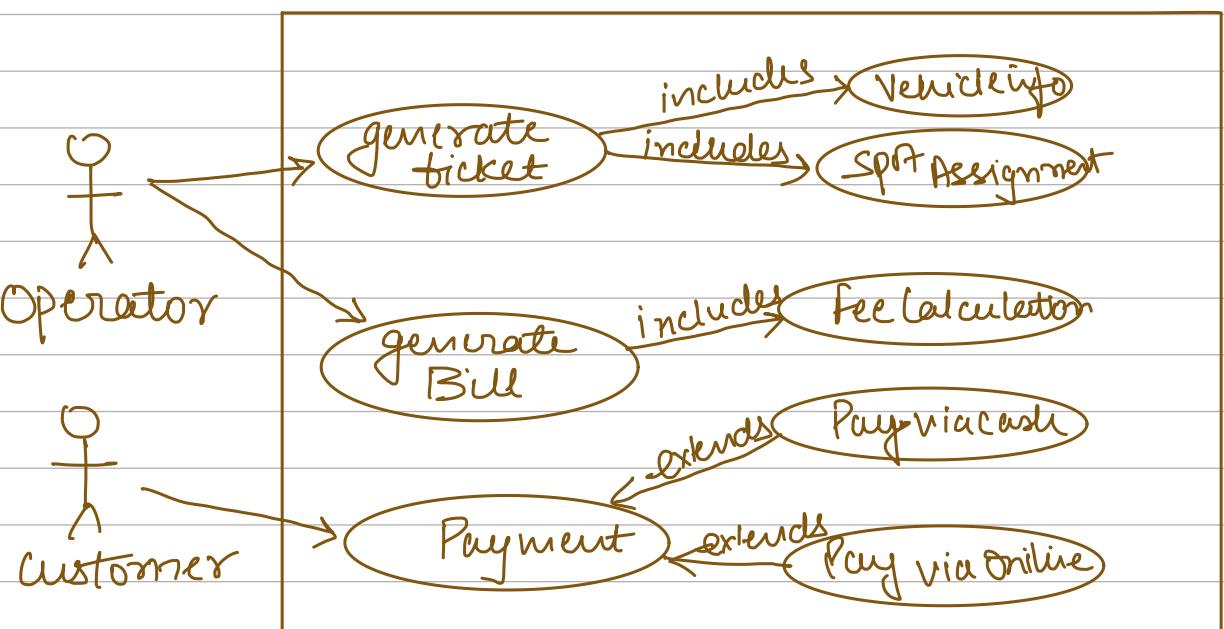
3) Partial Payment

User can pay the fee from different sources

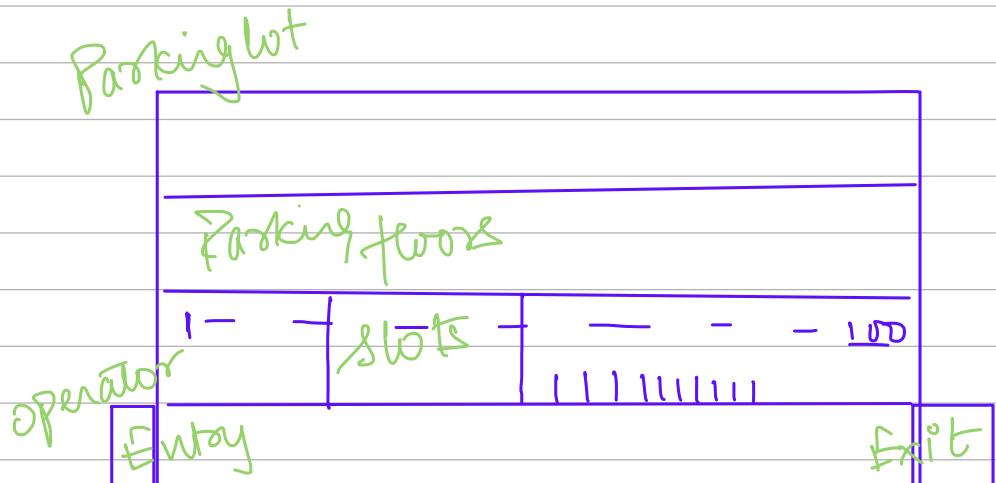
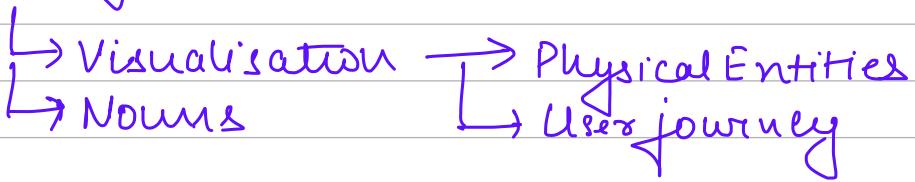


4) EVS total fees = $\frac{\text{Parking fee}}{\text{Electricity Consumed}}$

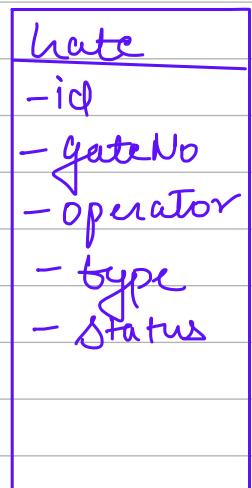
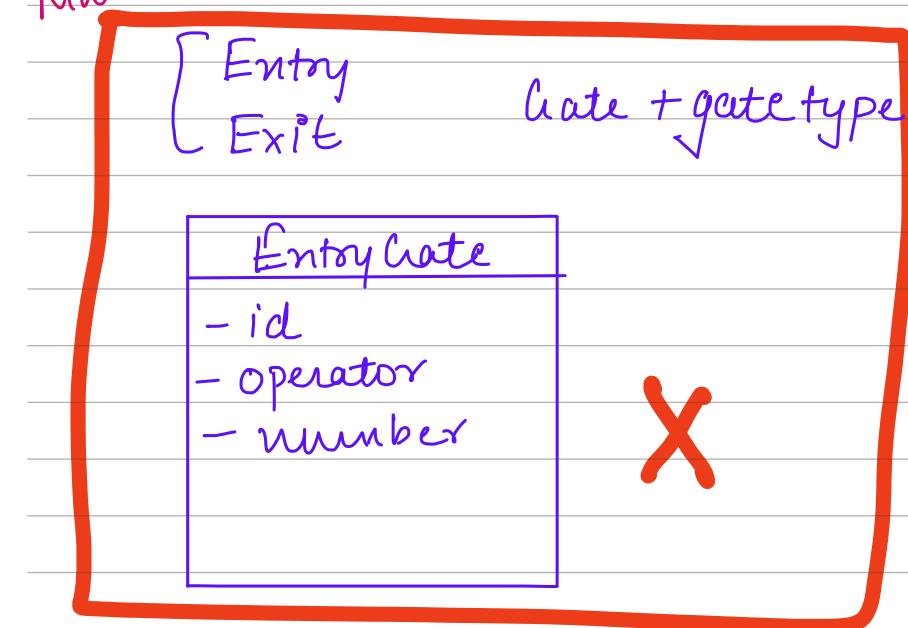
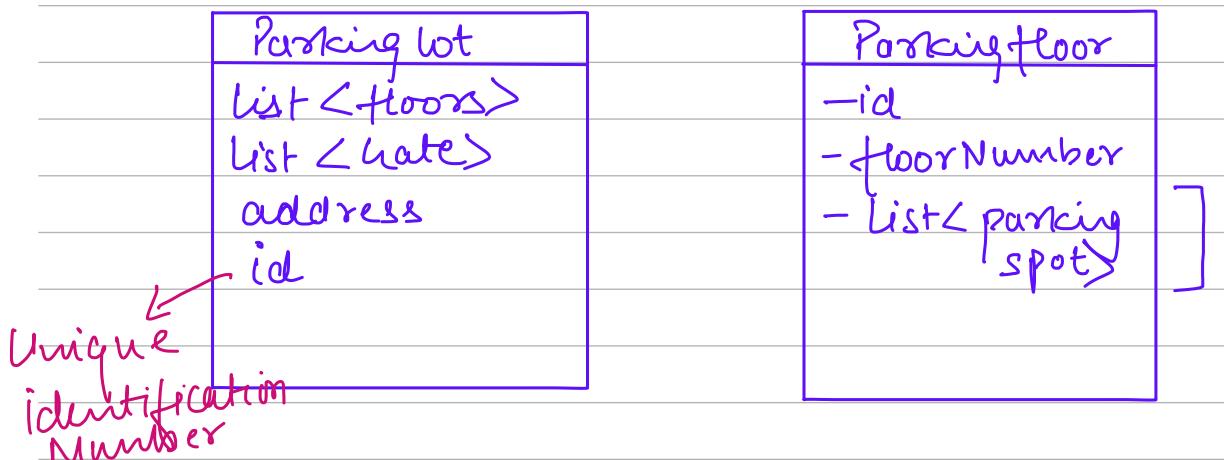
Use Case Diagram



Class diagram

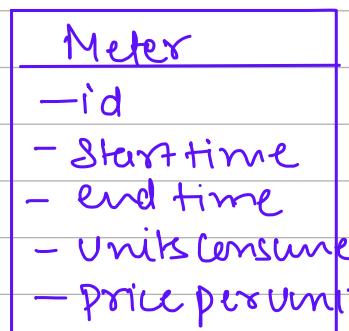
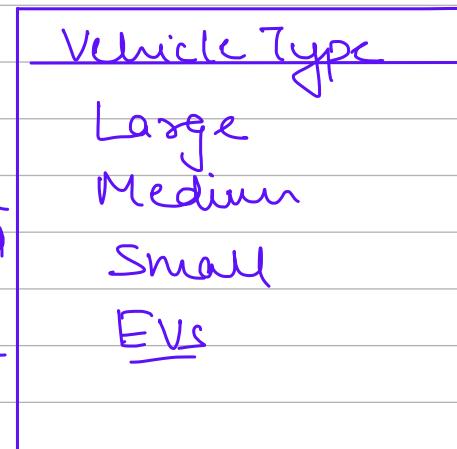
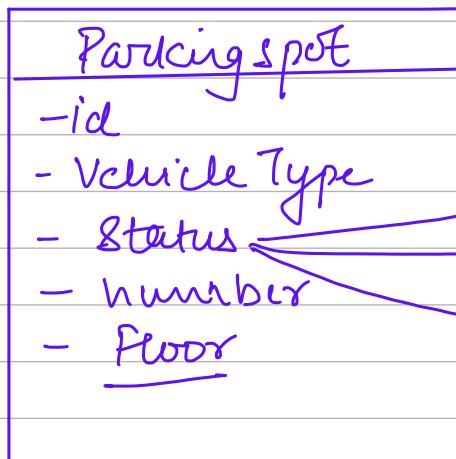


[PMS] → Mall
 → hospital



~~NOTE~~

We might store some redundant data somewhere if that info is required (DATA ACCESS PATTERN)

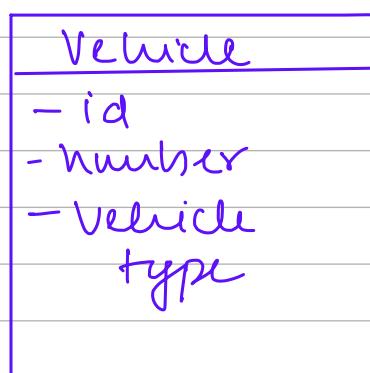


$$\text{Number} = \boxed{\text{FloorNumber} + \text{spotNumber}} \quad X$$

X

↳ Regex (Pattern Matching)]

ABC - 123 → slot Number
 └ Floor



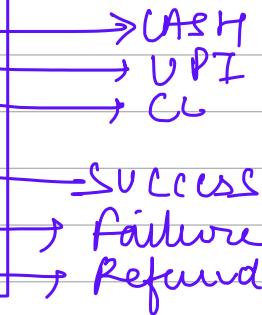
Ticket
- id
- entrytime
- vehicle
- parking spot
- gate (entry)

Bill
- id
- exittime
- Ticket
- fees (Amount)
- gate(exit)
- List<Payment>
- Bill status

Partial
Paymen

PAID UN PAID Refund

Payment
- id
- transid
- Mode
- Amount
- Status



Design Patterns

<<Spot Assignment Strategy>>

<<Fee Calculation Strategy>>

<<3rd party Payment Adapter>>

Builder for parking lot (NOT Required)