Elevator System Design

What happens when you press the up button on an elevator from the 4th floor, while it's already moving down from the 10th floor?

Elevator System Design

"Would you consider all these variables during the elevator system design process?"

Popular Elevator Companies :
- Otis
- Schindler
- Mitsubishi

Gen2® Prime

Budget-friendly lift for residential buildings.

BOOK NOW

Gen3™ Nova

Designed for low- to mid-rise residential and commercial buildings.

BOOK NOW

Price	From ₹818,021	From ₹979,037
Smooth Landings	✔	✔
Energy savings up to 75%	✔	✔
Sleep mode	✔	✔
Zero lubrication	✔	✔
Smart IoT technology		✔
Big data analytics		✔
Advanced monitoring		✔
Seamless elevator calling		✔
Max Rise	20m	60m
Passenger capacity	up to 408 kg (5-6 p)	up to 1020 kg (>13 p)
Top speed	up to 0.7 m/s	1.0 m/s
Max stops	6	21
Available aesthetics	8	20
Hall fixtures	TBC	Flat and flush
Handrail finishes	Flat only	Stainless steel
Handrail arrangement	Rear or none	Left or Right Hand / Rear
Car operating panels	1	3 variations
Entrance door openings	2	3

⇒

TS → OOPS → D Principles (SOLID) → D. Patterns

↓

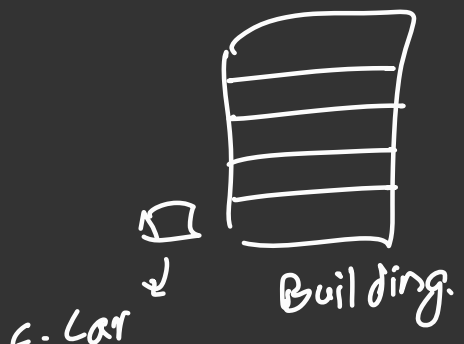
System Design (LLD)

↳ Elevator S.D

↓ State

↓ Strategy

⇒ Elevator System Design



→ How many Elevators

→ Elevator Request → Serve (Algorithm)

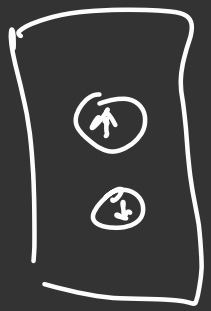
→ Floors ?

→ Capacity ? (7P / 950kg)

States: Idle → waiting for Request

Door Close → Moving

Door Open → Entry / Exit

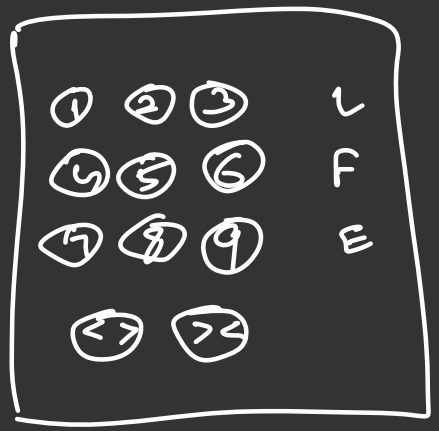


Outside Elevator

↓

Requesting for Car (Direction)

(Elr Curr Posn → Source)

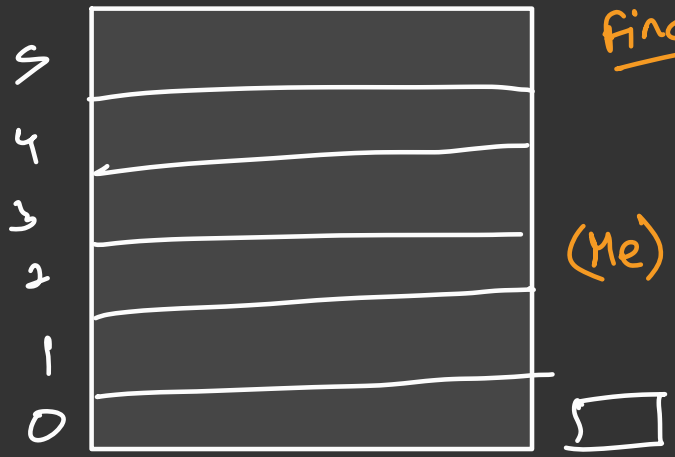


Inside Elevator

↓

Give Destination floor

(source → Destin)



⇒ Request (↑)

1. Car will be assi this Request.
2. Car (0 → 2)

⇒ Door open → He Enter → Door Close

(Moving state) ⇒ Serving

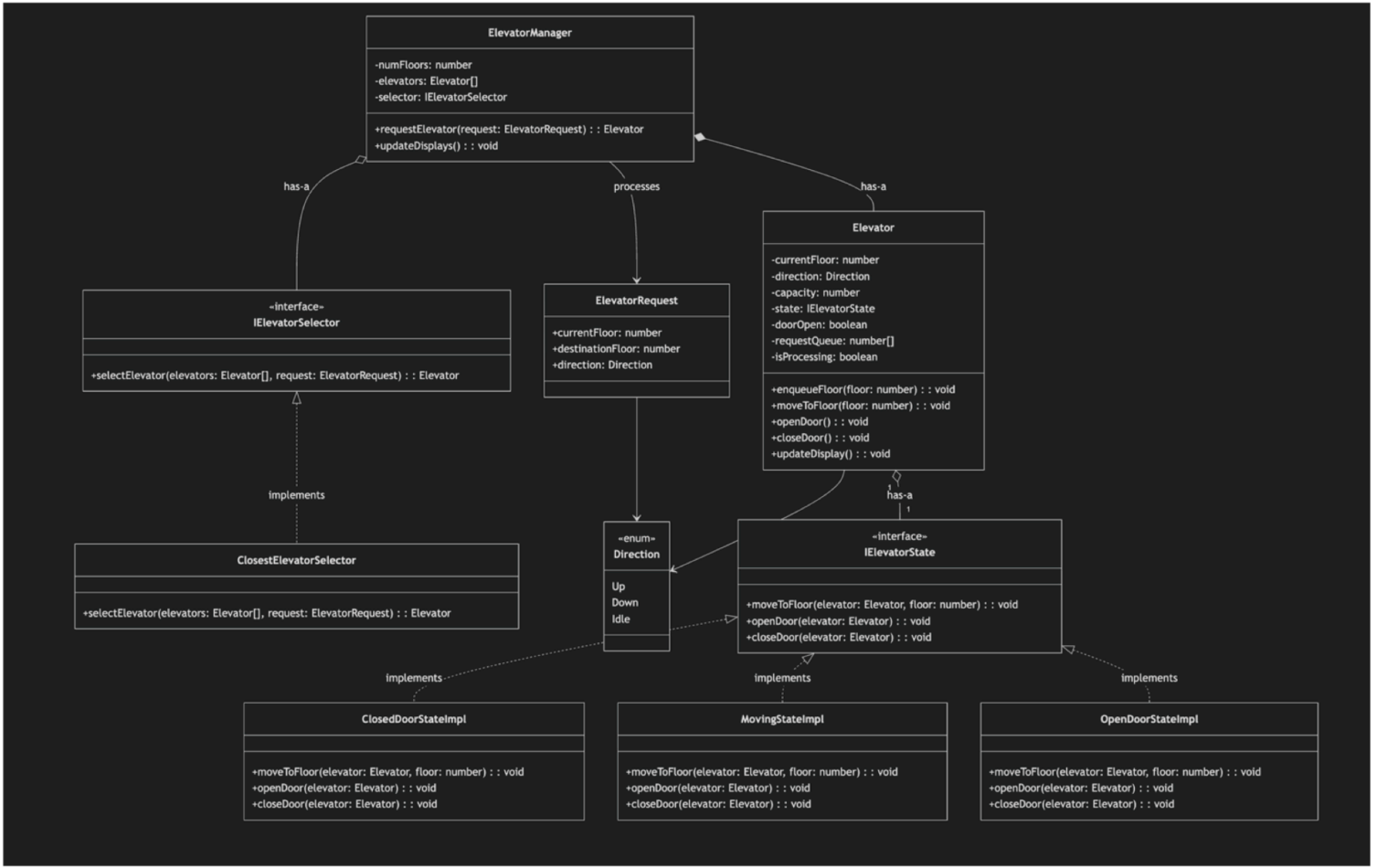
Car (2 → 5)

Building.
↳ elevators[]
↳ ElevatorManagr. → Boost Avail Elev
↳ floors.

Elevator
↳ capacity
↳ state
↳ direction.
↳ Queue

E. states
↳ CloseD
↳ close
↳ open
↳ Door
↳ close
↳ ops.
↳ Idle
↳ chgs
↳ op-

ElevatorRequest
↳ source
↳ Destin"


ElevatorManager
-numFloors: number
-elevators: Elevator[]
-selector: IElevatorSelector
+requestElevator(request: ElevatorRequest) : : Elevator
+updateDisplays() : : void
has-a
processes
has-a
«interface»
IElevatorSelector
+selectElevator(elevators: Elevator[], request: ElevatorRequest) : : Elevator
ElevatorRequest
+currentFloor: number
+destinationFloor: number
+direction: Direction
Elevator
-currentFloor: number
-direction: Direction
-capacity: number
-state: IElevatorState
-doorOpen: boolean
-requestQueue: number[]
-isProcessing: boolean
+enqueueFloor(floor: number) : : void
+moveToFloor(floor: number) : : void
+openDoor() : : void
+closeDoor() : : void
+updateDisplay() : : void
implements
has-a
ClosestElevatorSelector
+selectElevator(elevators: Elevator[], request: ElevatorRequest) : : Elevator
«enum»
Direction
Up
Down
Idle
«interface»
IElevatorState
+moveToFloor(elevator: Elevator, floor: number) : : void
+openDoor(elevator: Elevator) : : void
+closeDoor(elevator: Elevator) : : void
implements
implements
implements
ClosedDoorStateImpl
+moveToFloor(elevator: Elevator, floor: number) : : void
+openDoor(elevator: Elevator) : : void
+closeDoor(elevator: Elevator) : : void
MovingStateImpl
+moveToFloor(elevator: Elevator, floor: number) : : void
+openDoor(elevator: Elevator) : : void
+closeDoor(elevator: Elevator) : : void
OpenDoorStateImpl
+moveToFloor(elevator: Elevator, floor: number) : : void
+openDoor(elevator: Elevator) : : void
+closeDoor(elevator: Elevator) : : void