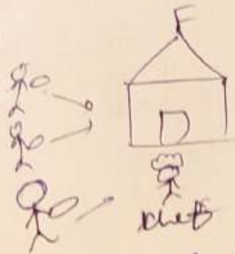
SYSTEM DESIGN

I OPENING A RESTAURANT



-> we have a restaurant where we have only one chef .

-> only chef won't be able to handle all orders.

AS A MANAGER HE CAN :-

① -> Ask the chef to work for more time & give him more money to inc the sales } Vertical Scaling.

② ie -> Optimize process & inc throughput using same resource

Que How to inc sales through only 1 chef

Ans chef can make the preorders at on peak hours (things like dough prepaeation, veg cutting)

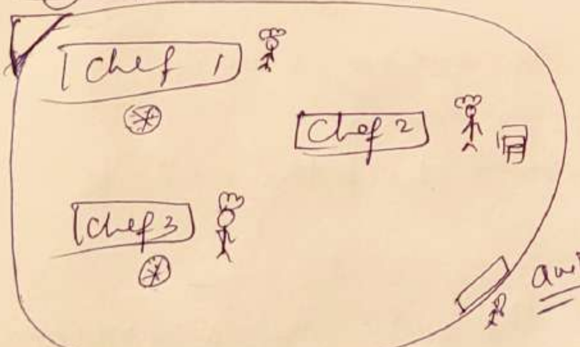
~~How~~ Now lets make it Resileant (ie practalistic)

one fine day chef becomes sick on that day ous buisnees is on risk.

sol -> so we can keep a bkp chef that will work
③ for only ~~o~~ the day the original chef is on leave.

ie keep bkp and avoid singe pt of contack.

④ Inc no of chefs



1 -> good in making pizza
3 -> good in making pizza
2 -> good in making garlic bread.

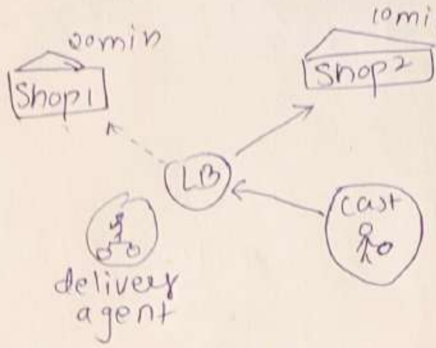
aw Now we get order of bread. whom to assign the bread order?

Ans -> we can randomly assign the order to 1,2,or 3rd chef but that won't be optimal cause if it is assigned to 1st chef and any new requirement comes, ~~he~~ there are chances he won't be able to do it with expertise.

⑤ so we can assign ⊛ pizza to only 1&3 chef
⊡ Bread to only 2nd chef

Que Now suppose our light goes then what ?

(6) Ans. So open another shop at different location 2
Adv → any order close to shop2 the order would be given to that shop



when a cust orders it needs to decide where does the request goes to which shop

Shop 1 → can deliver in 20min
Shop2 - can deliver in 10min.

(7) So there should Be a central system to decide where should the request goes and should make intelligent decision → Load Balancer

(8) Now → Delivery agent → delivery concern
→ Shop 1 & 2 → cooking concern
→ cust → ordering concern
} decoupling.

Each ~~to~~ one has their own different concerns even the manager is same.

(9) (Analyzing, Auditing, Reporting, Machine Learning)
Now suppose cust ~~se~~ orders, though shop 2 takes less time to prepare & deliver & is close to cust
but there could be possible that ~~o~~ oven of shop 2 breaks or tire of delivery agent fails that might take more time to delivery
So we want the last few events & their details gathering last info and finding pattern.
So we need to login to system & check the details

(10) Keep system extensible.
~~Ke~~ As we donot want to rewrite the code again & again

HIGH LEVEl DESIGN

Understand what kind of problems we can face
& how can we solve it.

LOW LEVEl DESIGN → coding stuff ie classes & functions

① Buy a machine to get work done } vertical scaling
② optimize work & inc op by same machine
③ keep another machine for bkp
④ increase the no of machines → horizontal scaling
⑤ Microservice architecture → define all responsibilities within one use case eg pizza assigned to only chef ① & ③ , garlic bread to only ②.
⑥ Distribute the system → for less fault tollerance and quicker response → ie open a restauant at loc 2
⑦ load balaner → a centeralized system to route the request efficently
⑧ Decoupling sys → seperating the concerns ~~to~~ so that we can handle seperate conerns
⑨ ,logging & matrix calculation
⑩ Extensible .