Today's Agenda:-

1) How to approach Schema Design.

2) MVC architecture

3) Design Tic Tac Toe

How to approach Schema Design:-

in sql b/w two tables cardinalities

1 : 1 :→ id of 1 side on the other side

1 : m OR M : 1 :→ id of 1 side on the m side

Redundancy ×

M : M :→ Mapping Table

1 User 1   1 Aadhar 1 :→ 1 : 1

left → right 1

l ← r 1

users

id	Name	email	aadhar_id
1	Umang	—	205

aadhar

id	name	bm..		user_id
205	—	—	—	1

1
m

1 Batch m — current 1 C. Instructor 1 → M : 1

In this scenario should be clarified by cross questions.. bcoz it can be M:M also

M : 1
B I

1 : m
I B

batches

id	Name	instru_id
1	Af24	2

instructors

id	Name	email
2	Umang	uma- . . .

we can not put b_id in this table bcoz one instructor can take multiple batches.. and it will be a list

list<batches>

✗

{2,1,5}

Storing non primitive data values in SQL columns => Not optimal

For these type of tables we generally need joins

1 Movie M — M Actor 1 : → M : M

we can not put movie_id or actors_id in these tables again that will be a list

movies

id	Name
1	Sikander
2	KKBKKJ

actors

id	Name
2	Salman
3	–
4	. . .

so need another table to map these type of data

movies_actors ✓ PK (m_id, a_id)

movie_id	actorid
1	2
1	3
1	4
1	52
2	2
2	4

For each entity, you'll end up creating a table in the db.

1) Req Gathering → Identify the entities

2) Class Diagram ✓

3) Schema Design

1) For each class in the class diagram, create a table.

Movie Actor movies actors.

2) For each primitive attr, create a column in the table as it is

3) For each non primitive attr, find the cardinality & use the appropriate rule.

object | data type

1:1 →

1:m | m:1 →

```
Class Movie {
    id ✓
    name ✓
    title ✓
    list < Actor > ✓
}
```

List<String> ✗

```
class Actor {
    id
    Name
}
```

movies_actors.

id	Name	title

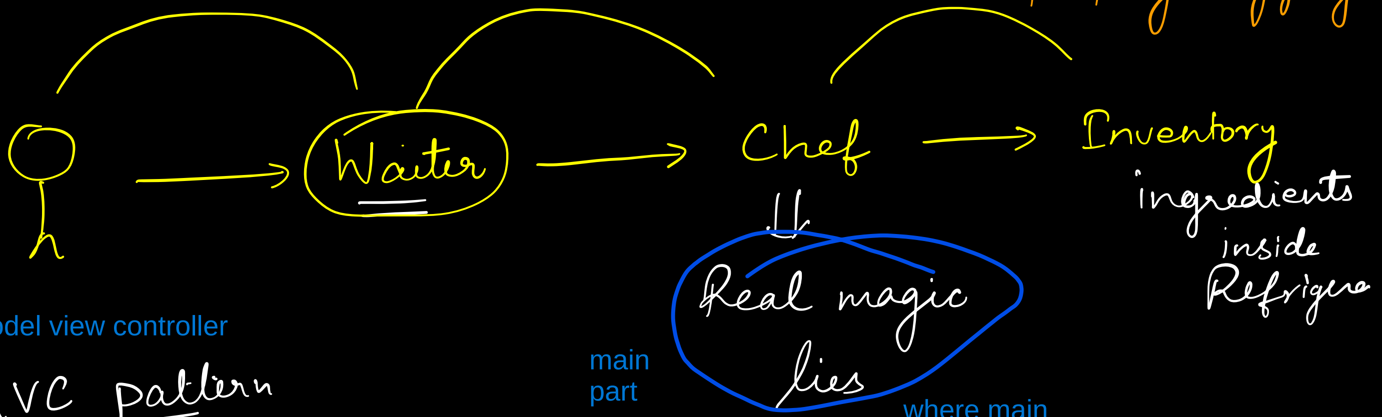
actors

id	Name

How to code ?

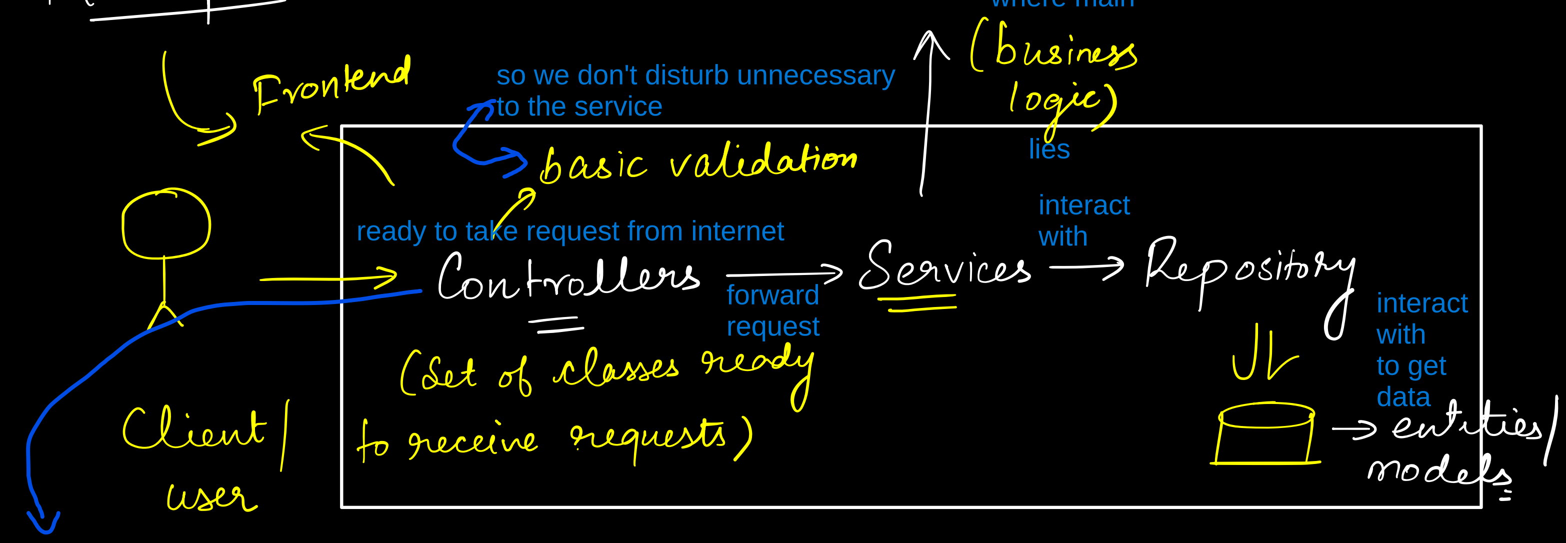
↳ follow some Standard practises for structuring your codebase.

Responsibilites are propely seggregatid



model view controller

MVC pattern

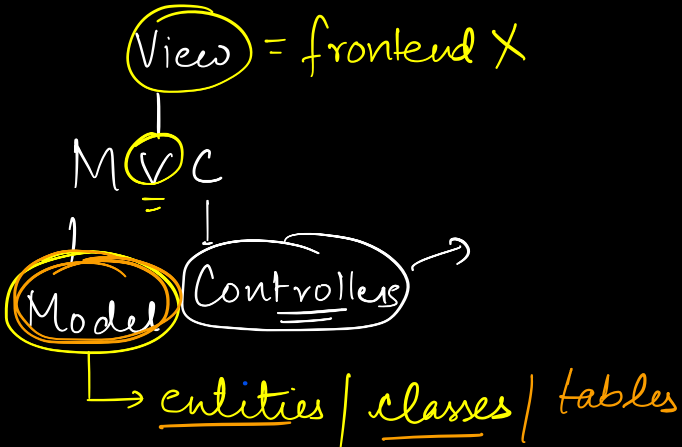

Frontend
so we don't disturb unnecessary to the service
basic validation
where main
(business logic)
lies
ready to take request from internet
Controllers
forward request
Services
interact with
Repository
interact with to get data
entities/ models
(Set of classes ready to receive requests)
Client/ user

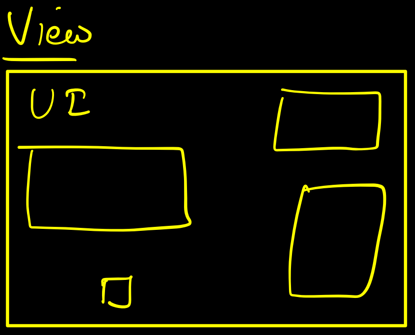
Application System.

e.g. when we hit in ui a request will go to google chrome and based on api data will be displayed on ui
so controllers are first point of contract.. in backend e.g. waiter.. and these are set of classes.. not just one.

API :- Appn programming interface.

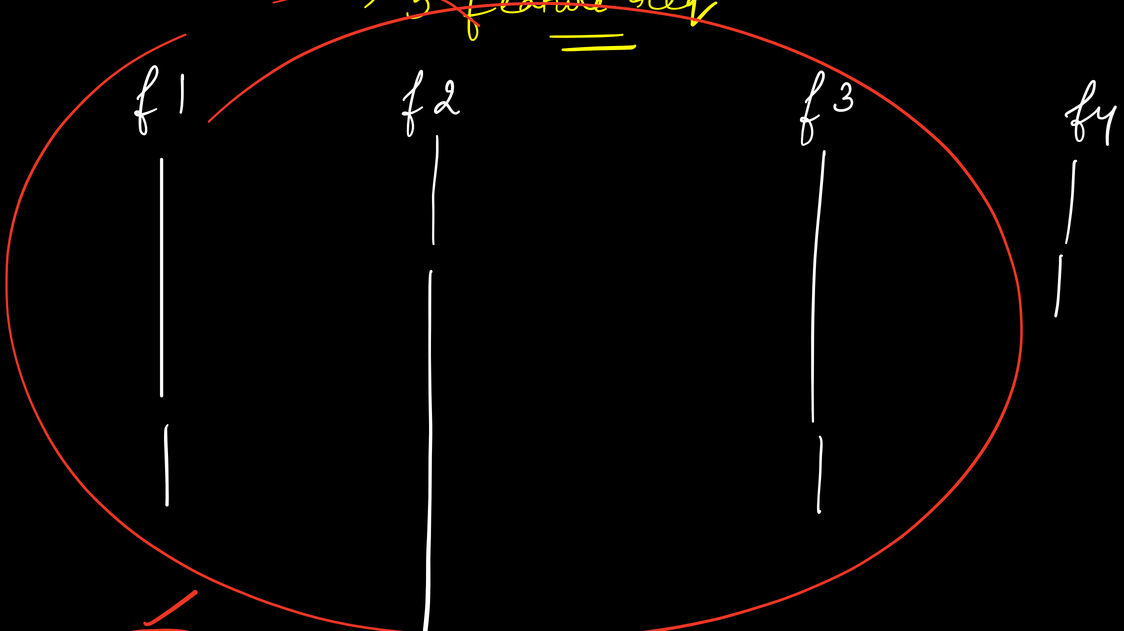
contract b/w frontend and backend





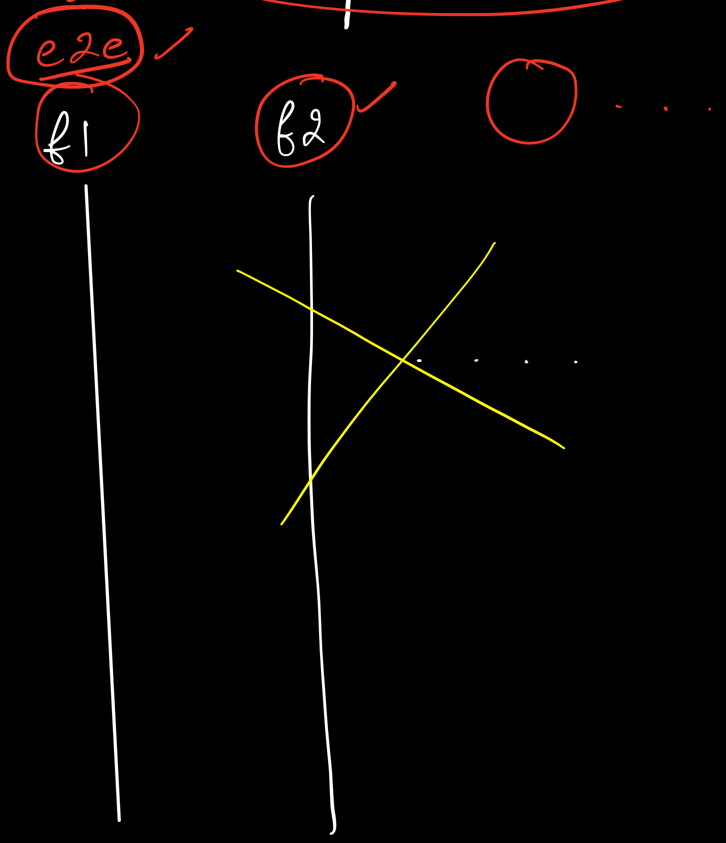
Req Gathering | 1 feature ??

↳ ~~3 feature req~~



⇒ Problem ??

Nothing will Completed e2e.



⇒ Atleast 1 f is going to work e2e

Note

Atleast 1 requirement should be working end to end.

↳ Code all the models (Converting class diag to code)

↳ Start implementing req by req.

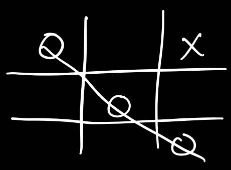
Tic Tac Toe

Design TTT :-

Step 0) Overview of the system

Tic Tac Toe (5 mins)

TTT

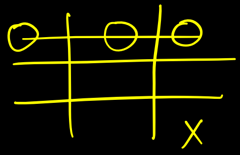


Know ✓

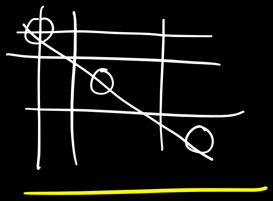
(Align your understanding with the interviewer)

Don't know ✓

(Ask the interviewer to explain about system briefly).



2 players



O X

What kind of system we are going to build?

Entity design

end to end working sol^n. ✓

Do we need to persist data? DB x

↳ NO

in memory db

⇓

Hashmap ✓

Step 1) Requirement Gatheing } => 10 min

1) Size of the board : N X N

we can ask interviewer like if cross board will be only 3*3 only or it can increase.. so if he says yes we can design for N*N board so parameter can be provided.

2) No. of players = N-1

3) Evey player will choose their symbol at the start of the game

if one has symbox X then any other player can not have same symbol

↳ (Builder Design patlern) ✓

4) Will there be a BOT? => No ✗
=> Yes

N-1 players

5) BOT will have multiple difficulty levels.

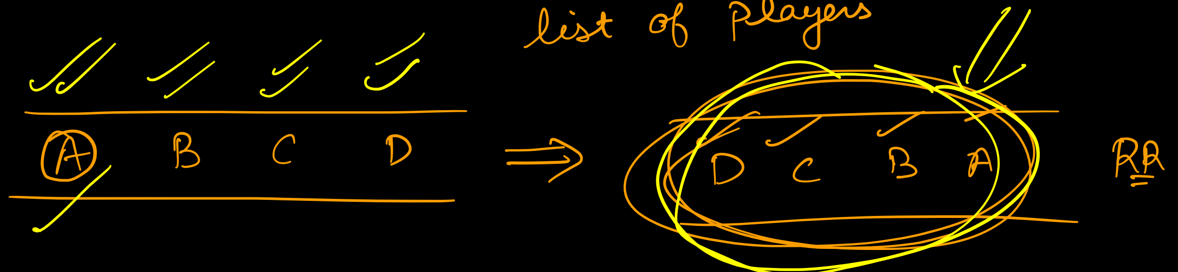
6) No. of BOTs per game => 1 BOT per game / N-2 BOTs per game.

7) Timers within moves? (extn Req).
↳ No.

8) undo feature? => Yes
↳ Global undo feature which wil undo the last move played

9) Who will make the 1st move?

↳ At start of the game, we will randomise the list of players

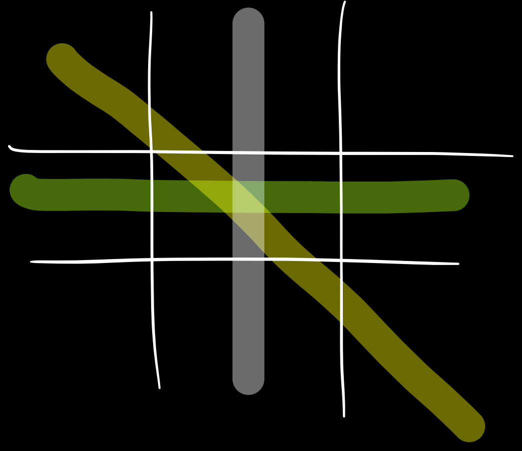


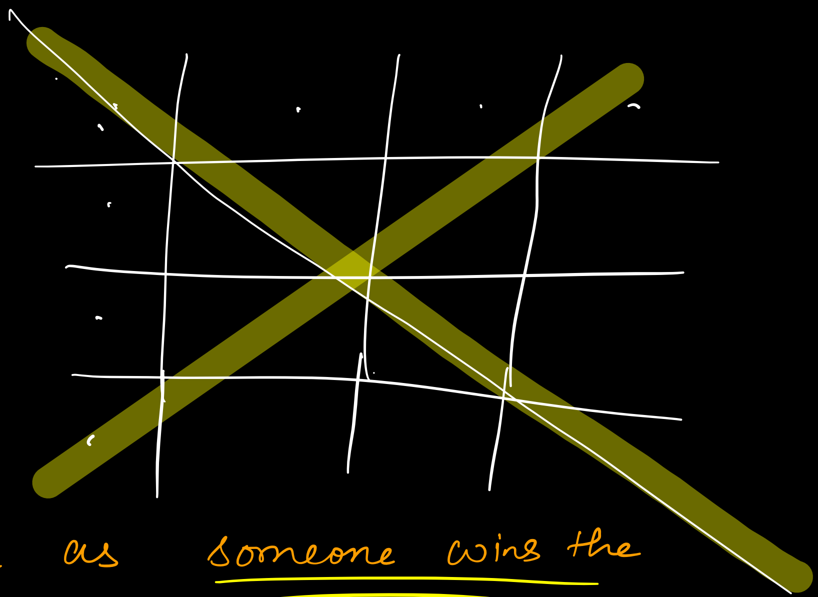
10) How to decide the winner ? → Row, Col, Diag } Strategy design path

If a player gets same symbol across any row OR any col or any diagonal.

1x1 2x2 Invalid

2 diagonals < P, S





10) Game ends as soon as someone wins the game OR it draws. ⇒ Show results.

Req. out of the box

- * Leaderboard
- * Tournament
- * Pause a game
- * Timers
- * exit a game

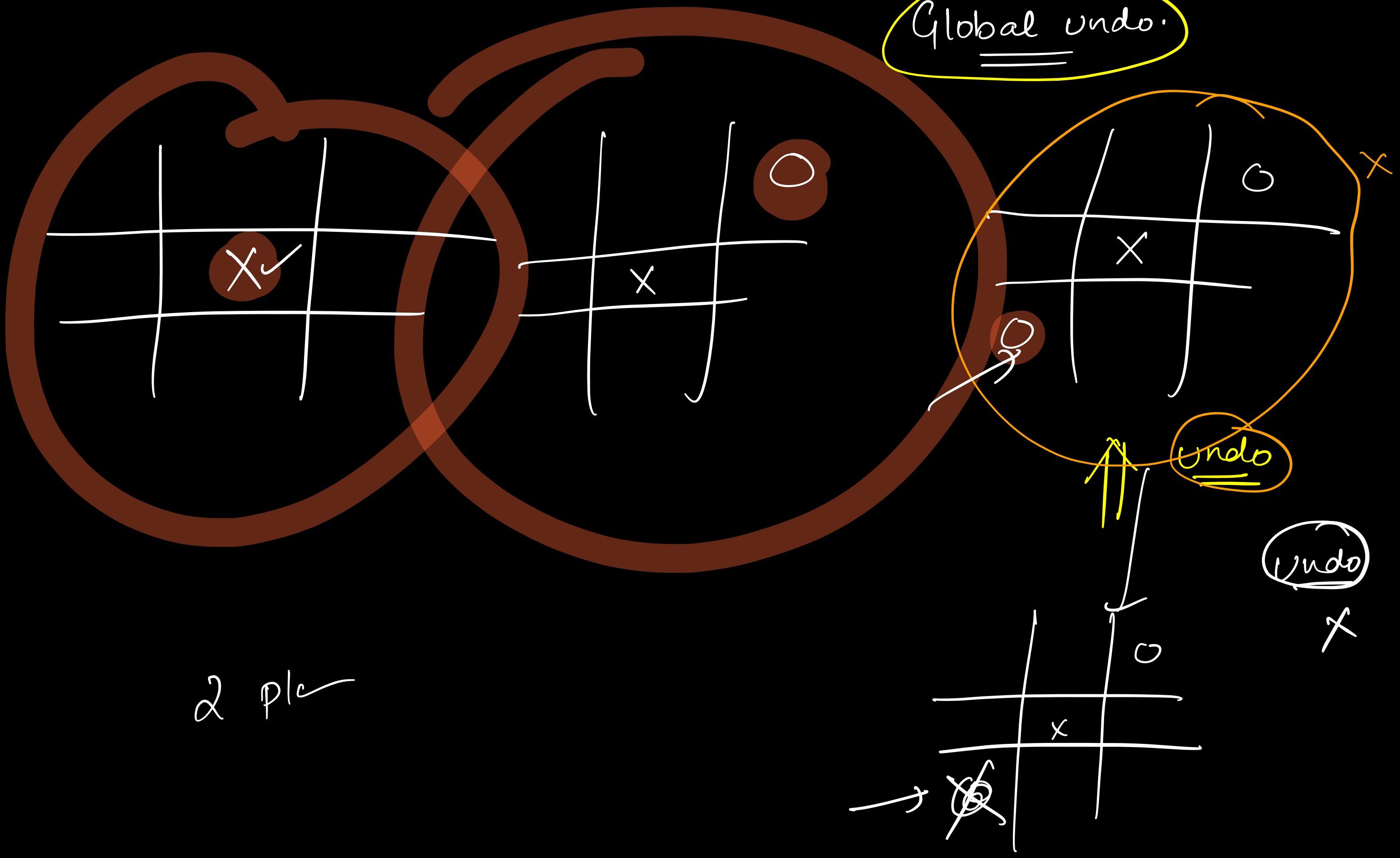
1) Solⁿ should work ✓

Sol^n

HW → Please think about how will you implement undo feature ?

⇓

Global undo.



2 pl

⇓

Game theory

N X N

N - 1

2 play 3 pl 4 p