

STUDY NOTION

- Login/Sign-up → OTP verification



→ Next window
(using Back/Next ke Jaise)

- ① List previous
② update my OTP

Valid for Only the latest transaction

using the first "transaction"

► Change Password :-

- ① get data from step 1
 - ② get old password
 - ③ Validation
 - ④ update data in DB
 - ⑤ Send mail - Password
 - ⑥ return response
- I use 2 controller
c1 and c2,
- c1 → will be like change
password change in,
c2 → DB to update database

→ Post-Save

lock user karo

(mujhe tabhi database me kai

entry save/insert hoga tabhi, use Pahle Keuch
specific code execute honge)

Xe code tumhe OTP ke

'Schem' ke niche likhna hoga, aur jiske 'Schema' ke
orders implement karna hoga!

① Reg ki baki se email length
aur check krenge, user already exists
or not

• Yes - return response

• No - generate OTP

Mistake/Warning :-
1 → Old OTP create kia tha tho, aur DB ded kia tho agar
OTP mil gya ha
to the generation

2 → Old OTP create kia tha tho, aur DB ded kia tho agar
OTP mil gya ha
tha abhifind I create only unique OTP everyone

and returning the token and a status as if token given to API by user worked

Auth ke hum jemne wala token Verify karte hain agar some nil value place in user
(authentication check karte)

course → video/image → upload on cloudinary
as thumbnail
↓
media storage server

date h to thik h, mil to update hoga
detach.

Sign In :-

- ① Data fetch from step 1
- ② validate token
- ③ 2 password matching
- ④ check user exist or not
- ⑤ find most recent OTP stored for the user
- ⑥ Validate OTP
- ⑦ Hash password
- ⑧ Insert create in DB
- ⑨ Return response

Logout :-

- ① get data from step 1
- ② validation date
- ③ user check exist or not
- ④ generate JWT, after password matching
- ⑤ Create cookie and send response

Razorpay ke liye I have to use Order API (I chat documentation)

→ user ne course buy kiya aur pay kardya apne bare razorPay ka ah, nyle as a StudyNation Platform maybe kee
Razorpay ke ek function h user na bol dia ke tab transaction successful hoga to tum na ek API create kia ht
Razorpay ke API mere StudyNation me use hoga h
Aur ab ye kee main ke kya saarely ne li kar h, to main as secret key Pahla di aur use user se keege phis last me main
apne secret key verify karunga

Topic 2 K new notes

→ Open & Create

► Rating & Review :-

WEEK 11 M1 T2

- ① get user id
- ② fetch data from user body
- ③ check if user is enrolled or not
- ④ check if user already reviewed the course
- ⑤ create rating & review
- ⑥ update course with this rating/review
- ⑦ return response

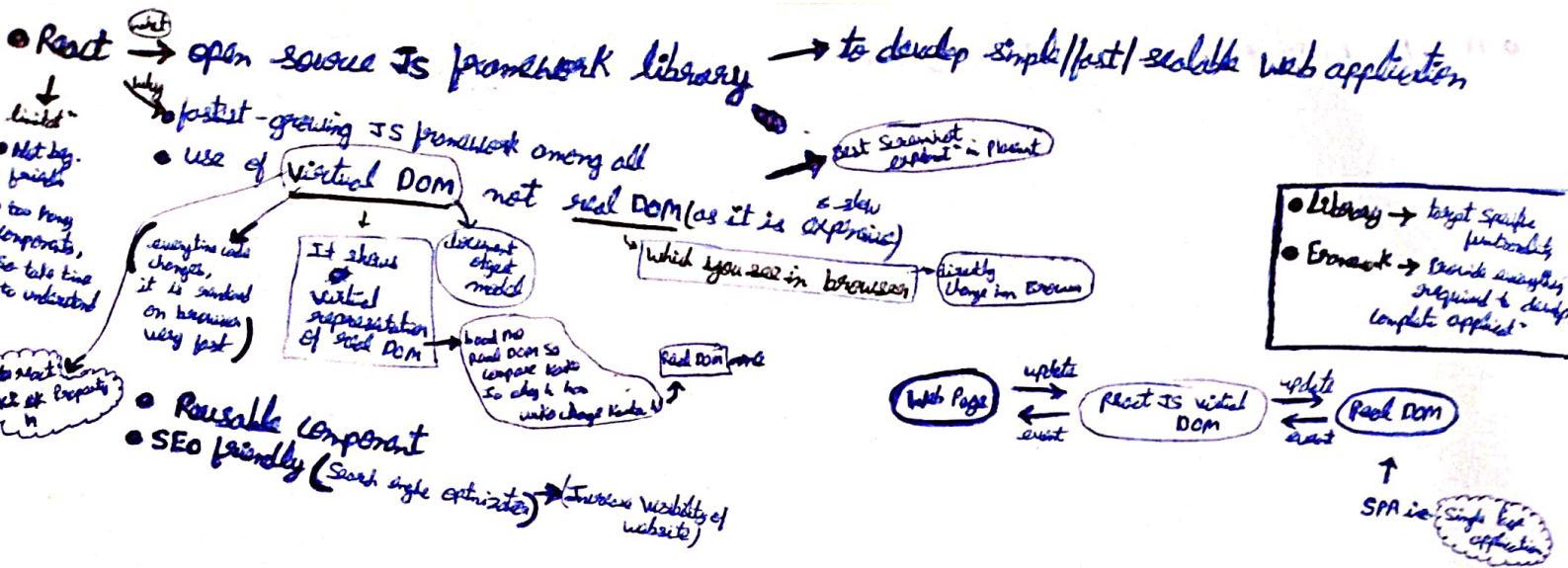
► check once, PDFs → **API connection**

► How abra hi kota h → Server side me main me kuch code likha aur wo mongoDB me push kar diya, lekin mujhe apne frontend side us value ko use karke UI pe show karne h to, main server side pe hi fetch karke uska liya aur API call karke Server se frontend side mongo liya aur koi back jese useState hook ka use karke uska UI pe show kar diya.

► Postman ko hum MERN stack me isliye use karta h kyuki ye Ek Powerful tool h Jo hume APIs ko test karne, debug karne, aur unke response ko dekhne me help karta h, MERN stack me, backend typically Node.js aur Express.js banaye jata h, Jo API create karne ke liye use hota h.

Postman se ye APIs easily test ki ja sakti h bina kisi front-end application ke.

Q - stuck in RazorPay, as The payment is really done by user or anyone. So, we key "exception" (OTP step)
 Q - Not exactly I stuck but modify → Reset OTP (OTP step) [the show was
done via ✓]



① User State → It is one type of the hook
(when we change the value & reflect it on UI, then we use this)

[..., , ...]

↑ ↑
Value of function that
Variables helps to change
 the value

- Hook → we can use static & other neat features without writing ~~and~~ class
(it sounds like pre-defined function)

② **useEffect** → If you want to do any task after rendering,
(i.e. Merge Side Effect)

```
[..., ...]  
↑  
callback func  
↑  
array of dependency
```

- Why use keys?
 - ↳ we generally keys when we map.
 - we avoid using array index as key

- ① Event listeners (to touch, table touch log)
(on click → Class)
↳ Phases
 - Capturing Phase
 - bubbling Phase
- lesson file
- Performance () → Performance.now() → depend on → Reflect → Set time out → Request → Response
 - ↳ browser
 - ↳ browser + code change
- Event loop
 - ↳ asynchronous function
 - Cell Stack
 - Event Queue
 - ↳ Set time out list
- Promise → either → resolve/reject → then/catch()
 - ↳ return promise
- API 2
 - JSON format
 - Web socket

• Prop drilling

All set

Parent

child

Keen Auto
Change the
opposite seats
driving

Context API

Parent
Child

Keine lokale Variable, die bag hier zu bilden nicht nötig

- Inner Join



100

Select * from Tab1
inner Join Tab2
on Tab1.numid = Tab2.numid

- Left outer Join



Select * from Tab1
left outer Join Tab2

on Tab1.numid = Tab2.numid

| | |
|-------------|-------------|
| Rank | → 1 2 3 3 5 |
| VS | |
| Desire Rank | → 1 2 3 3 4 |

- Right outer Join



Select * from Tab1
right outer Join Tab2

on Tab1.numid = Tab2.numid

- Full outer Join



Select * from Tab1
full outer Join Tab2

on Tab1.numid = Tab2.numid

③ Cross Join

(New)

Select * from

Tab1 Cross Join Tab2

- Select max(), min(), ~~avg()~~, sum(), count() from employee;
- Select * from employee where commission between 0.1 and 0.14;
- Select * from employee where name like '%c';
 '%R%';

④ find total of salary of employee based on the deptno. and job

- Select deptno, Job, sum(sal) from employee
group by Job, deptno
order by deptno

- Select deptno, max(sal) from employee
group by deptno

Having max(sal) > 7000;

- Select last_name, Job_id, Salary from employee
where Job_id =

before (143) part (Select Job_id from employee)

(03) (last_name where employee_id = 143))

and Salary >

(Select salary
from employee

where employee_id = 143)

HR

▷ Introduce yourself :

- Good Morning everyone, and Thank You for this opportunity.
- My Name is Anish Kumar Sinha and I am pursuing my Computer Science(B-Tech) from VIT Vellore.
- Throughout my academic journey, I developed a strong passion for Web Development and developed my programming skills by taking part in various coding contests.
- During my internship at Valero Technology, I had the opportunity to work on a variety of tasks related to web development and SEO optimization.
- During my internship, I learned valuable lessons about the importance of teamwork, effective communication and time management.
- ~~As your company is hiring for the same skills, I believe I am the right fit for this role. I am eager to contribute my skills to your team and grow as a developer.~~

▷ Are you Planning for further studies :

- As of now I have no such plans for further education, I am really excited to work in the real world, get Industry experience and understand how business works.
- However, I strongly value the concept of continuous learning. I intend to keep upgrading my skills with the latest technologies through online courses and certifications.

► What are your strength and weakness:

RH

- Sir, I feel my biggest strength is Leadership and Team Work. As I led a team in one of the 48-hour hackathon organised by VIT vellore, where my role was to get the data set of leaf-detection (end-to-end) solution and Implement in Web. After the completion of the Project, I pitch the Problem statement and full detail solution to the ~~interview~~ Judges.
- ~~Shyness is something that I struggle with in large groups. I was hesitate to talk with the stronger. As a result, I always tried to take part in college events and hackathons, And delivering my unique ideas and approach and overcome the shyness. Delivering my thoughts to my team is ~~not~~ I do easily but to other team/members where I feel shy (little bit)~~

Sir, I was very impatient person, when I start something, I always wanted to end before sleep or eat, which causes bad side effect on my health. As a result, I am trying to do Yoga to become Patient Person and Stressless Person. (\$ chant MC everyday)

► Why should we hire you:

- I have carefully reviewed the Job description and its clear that you are seeking a web developer with expertise in full stack development. My education as Computer Science graduate, along with my full stack project, coding developer and Internship, all align perfectly with your requirement.
- During my education, I took on the challenge of creating a full stack project, which involved designing and developing a dynamic web application from scratch. This exp. taught me the imp. of efficient code, and user experience. Also the internship exp. of client satisfaction & project complete on-time makes me located.
- My ability to seamlessly transition from concept to code, along with my problem-solving ensures I can make an immediate impact on your business.

Intern

- During my internship at Valco Technology Pvt Ltd, I had the opportunity to work on a variety of tasks related to web development and SEO optimization.

My Responsibility -

- I was responsible for implementing frontend optimizations using Next.js. My work involved enhancing the website's SEO through various techniques, such as optimizing meta tags, improving page load times, and ensuring mobile responsiveness.
 - These optimizations led to up to 30% increase in search engine visibility and a 20% improvement in overall website performance.
- I also interact with client, working on client project where we built websites according to the client's requirement. Although the projects were relatively straightforward, they provided valuable insights into client needs and project management.

Q- What are the challenges you faced and how you solved it?

- One of the primary challenges was optimizing the website's performance while ensuring it remained SEO-friendly. Balancing these two aspects required careful planning and execution.
 - Solution: I implemented several performance optimization techniques, such as code splitting, lazy loading of images, and minimizing JS. These ~~not~~ improvements helped maintain a balance b/w performance and SEO.
- Working on client projects involved understanding varying requirements and delivering results quickly, often under tight deadlines.
 - To tackle this, I communicate effectively with clients to gather precise requirements and used agile development practices to ensure timely delivery. I also sought feedback regularly to make necessary adjustments and ensure client satisfaction.

Q- What are your key learnings?

- Gained hands-on experience with Next.js, React.js and SEO techniques. Learned to apply modern web technologies to real-world projects.
- Improved my ability to understand client needs and deliver basic yet effective solutions quickly.
- Developed skills in balancing performance optimization with SEO and managing client expectations.

extra

- ① 20.30. → To performance aur SEO improvements ko do website analytics tools se mila, jisme google analytics aur website performance monitoring tools shamil hain. Google Analytics ke through humne search engine visibility aur user engagement metrics track kiye, aur website performance monitoring tools, Jaise EyeSpeed insights aur Lighthouse, se page load times aur performance metrics ko measure kiya.
- ② who is client?
our website
Kya features
tha?
- Internship ke dekhe, specific clients ke details confidetial the, lekin idea ye tha ki clients ke requirement basic websites develop karne ki thi. In projects me clients ne mostly simple websites banane ke liye requests ki thi. Jisme unki business info, contact details, aur basic functionalities include thi. Humne unke req. ke all. websites design ki aur basic features implement kiye, Jaise ki contact forms, service descriptions, aur simple UI/UX.
- ③ meta-tag,
page load time improve,
kese kya aapne
- Meta tags optimization ka matlab hota h, website ke HTML me specific tags add karne jo search engines ke page ka content somewhere me match karate h. Eye speed tags page ki relevance aur search visibility improve karate h. ▶ Page load times improve karne ke liye main code splitting aur lazy loading implement kijiye. For ex:- React components ke aayne bad karne ke liye 'React-lazy' aur suspense ka use kijiye. ▶ Issa initial load time kam hota h. Youski component tab load hota h tab zaroor hota h. ▶ Video Tech. Pvt Ltd ek custom soft. development company h Jo clients ke unique needs ke liye solution banati h, company consulting, training aur support services bhi deati h taki clients apne software se maximum benefit le sake. "CEO - Sonalika Agarwal"
- ④ company ke kise ne
aut
internship kesi Mile?
- ⑤ Kya aap Khud
client se bat
karta hain, kew
aur frequency?
- Ham, main khud client se bat karta tha email ke through! humne client ke saath regular update aur feedback sessions conduct kiye.

- Where do you see yourself in 5 years
- My focus for next 1-2 years is to really understand the specific of this role and become the domain expert, understanding ins and outs of the project I work on and collaborating effectively with my teams.
 - Following this, over the next 2-3 years, I aim to actively enhance my skillset in development. I plan to invest time and effort in upskilling to handle more complex tasks and pursue higher positions. By continuing my knowledge, I aspire to be prepared for larger and more complex projects.
 - As I look further ahead, my ultimate vision for the next five years includes stepping into leadership roles. With consistent dedication, learning and growth, I see myself leading projects and perhaps even taking on managerial responsibility. My aim is not just to excel in technical aspects, but also inspire and guide others in the field of development.

► Why do you want to work for our company

- Thorough research about company
- Show interest in company goal/service
- Highlight your skill/exp that contributes to company's goal
- Tell them company's goal/mision excites you
- I want to contribute to company's mission by being company

(start with freedom)

► What is your salary expectation

→ As of now, I haven't thought much about my salary expect. My main aim is to learn & understand the requirements of this position & how I can contribute to company's success. I trust that the company will offer a fair compensation package based on industry standards and my qualification.

► Do you have any questions? (1-2)

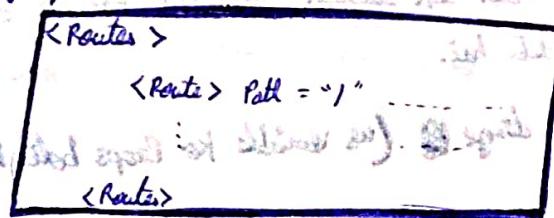
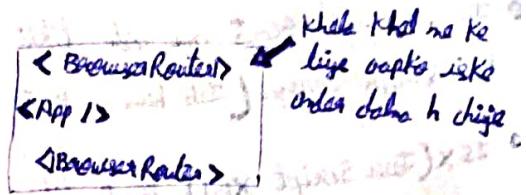
- What are you expect from a new hire for this position?
- Do you have any feedback for me?
- Can you tell me more about the team I would be working in?

FRONTEND (REACT)

- Is main me react me code littli h use convert karne h equivalent JavaScript code me jo mere because ko smjhayga (jab hum ye karte h \Rightarrow npm start)
- JSX (JavaScript XML) React library ke onder ek syntax extension hai jo apko JavaScript me HTML-like syntax likhne ki swidhi dekti hai.
- Props \rightarrow components ke hi variable bhi change (as variable ke props hotte h)
- Components me (Props, children) bhi use karte h karke \Rightarrow agar kisi to 'card' mein ke onder ke use codes visible nahi hoga.
- Is me event listener tha ki jisse hum click kijiye to ye event hajayega use hi yha react ne use jagah for hum **Props** use karenge
 - \hookrightarrow waha maine 'on...' se start ho, jisse onclick, onstart.
 - to waha liye hum 'state' ke use karenge
- onclick se click karne par wa value change ho jaye UI Par bhi
 - Ebina state ke barے onclick me likho se nahi hoga re-render UI.. Wo to UI ya ek barے click karne se change honge to UI database se render/Load logic aur wa main change hajaygi
 - usestate basically React Hook h.... **useEffect** basically ek utility function h (jiske help se main kuch kuch change kar sakte h)
- Local State bhi pta lgा sakte h using **useState**
- Agar Components me 7 card ke card h to main abhi abhi 7 cards ki component nahi honge, rather I use map function jisse main sare 7 cards ke card h hoga bna honga !!
- Side effect - aisa main ke chos ki jo component me hoti rहतi h, waha chos ke kisi aut ke components me change hajayega to waha main uska main as a side effect ke jaan beat kar sakte h
- **useEffect** manages Side Effect
 - \hookrightarrow React 3 variation \rightarrow
 - call for every render
 - call only at 1st render
 - depend on dependency
 - \Rightarrow **useEffect (u \Rightarrow e, [u])**
 - \Rightarrow To handle exactly of expected
 - New return value
 - New return all the

- Generally, hum useState aur useEffect hum start me hi use kagja hote h!
- Generally, hum useEffect ka use API call ke liye karte hain

- Router Router
 - Job apse navigate hona chahte h (bina Page Reload)
- Ek-ek Parke Route likhenge



<NavLink to="/" > Home </NavLink>

Milneb Hona click karne Pe
is link ke chahne Jedge

- Home → /
 - about → /about
 - Support → /Support
- So basically main nested Routing
bhi kar sakte hain

- Router Hook ek utility h, abhi tk hum log 3 Path h → useState

useEffect

useNavigate [ye dusre-dusre state me navigate karne ka h]

- Custom Hook v bna sakte h

- Feth ke jaisa hum Axios bhi use kar sakte h,

JSON Me
Pass Karne
sakta h

by automatic

(use ye jyada se h)

use v child ko direct add kro

- Context API wali chis ka ek aur trikha se kar sakte hain

whole controlled kar liye, yha pe use controlled ka diff-diff Slices me hota hoga aur easily access karla
Koi v component

REdux

- To create the slice, use `function` → **CreateSlice**

- Slice banaya counter ka jisse rone h, initial value define kar liye, aux function (yani ki reducer)
[define karke bol diye ki increment se ye sab hogya aur decrement se ye sab hogya]

- Reduc to convert ko link karne ke liye provider use kar liye

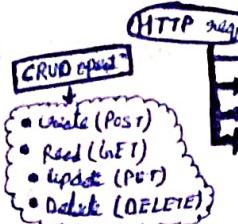
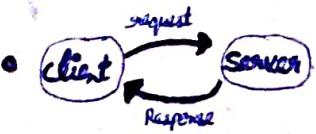
- useParam → Job apse URL Parameter ko access karne hote h. --- /user/123

- useSearchParams 2 koam karne hain, access karne query ka aur update karne

- useLocation me hum both initial sakte hain '... ' ke baad hole ko split karne aur like

E...] Se 1 aise our jo h uske dede

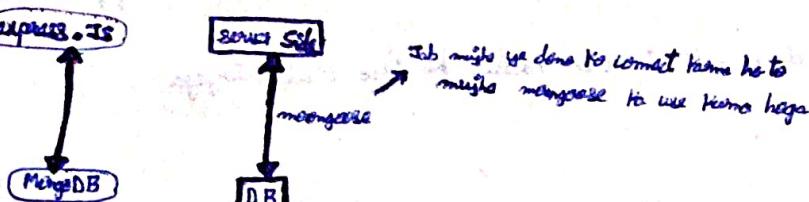
Backend



- use MongoDB compass to interact with DB
- mongoshell (CLI)

- agar mija kuch ki Server Side Create Karne h to main ek framework use karta hu → **EXPRESS**

express.js



→ ek taraf data object ki taraf h to abhi aur ek taraf data document ke taraf.

Ye done to Sambhalta h - ODM

ek taraf ke library h → MongoDB

- Tab bhi database me kuch bhajna hoga jiske according schema bhi lange

(On Model ~ same hik
bhi 2 roon)

- ek routes main ke folder h jise main apne routes create karunga, woh main define karunga Path keis kis controller se map h, aur controller ke ander exact logic likha hoga ki uski apna kya karne h

- neden se hum jese hi koi change karne ke directly backend (server) me reflect hoga, bas bas terminal me run nhi karne Padega

- Route handler wa function hote h jo decide karta h ki specific URL par come wali request ka kaise process karne hai.

- MongoDB function me bahut si chiye use karta h jiske ki - create, findUnique, findById

- ▷ Fetch ke liye mongoDB me → **find** use karta h
- ① Fetch all entry from DB → **find**
- ② Fetch specific entry → **findById**
- ③ update entry → **findById and update**
- ④ delete from DB → **findByIdAndDelete**

- ▷ hum 2 tarika se data ke DB me Bach Kar sakte h,
- **create** (create all karunga)
- **save** (ek object create karke into some variable)

- ek model (or Schema) ke onder ek dusra schema use ho sakte h to (id, ref) ke use karte h
- ③ us id se related "compte" chilgi ke **populate** ke use karunga

- Password ka hash/encrypt ke liye beaypt kar denge

- ▷ **JWT - JSON Web Token** - ek secured way h information transmission
(apne logi token ke, apna session ek JWT token generate karlete h)
so token mere server → client ke data h

- ▷ aut mere client wale token use karta h, wo token ke liye hi need nhi Padgi
use logi token ke data hoga to abhi logi ke
use logi token ke data h, to koi hard to h!!
JWT ko help ke nahi dete v
Plz logi token h!!

- **JWT** → kisi token ke form se response ke sare logi details aur Phir chait side keh logi dege!
Wo token ke hard to ke store logi token, Jiss token Shopping cart me kya data/item h wo itna logi token h.

- ▷ Jisse **SetCookie** me JWT dete h as a response wale hi use cookies hki token di as a response

- **JWT + Cookies** - kaha done ke help ke authentication + auth. kei sakte h

- JWT token create karne h lekin utne ita mili to main ne documentation path li Phir uske according leka kiji
- Receipt me ek fact h Jisme main 2 Password ke check kar sakte hu sans h ya mili using → 'COMPARE' function → isme ham 2 argument denge hash Password aur normal Password, Phir wo verify kar lega!!
- JWT token bna gya tha to yad se Password hta dena mili to wo hacker ke pass chahi Jayega
(user.password = undefined)
- Middleware has ek function h, ye chahi kijiya → kya ye authentic user h ya nahi
- ek route main ne banya → 'isStudent' → ye Protected route h (Kewal student hi dekh sakte h), ab main kaha tha lgunga ki ye route Protected h ya nahi ⇒ using middleware
- Token bana server side se, wo se role(middle) aur compare karne → isStudent → (habhe tu Yahi Page dekh student ki woh aur hoga ki)
- Jis order me middleware define kiji ho ussi order me Jayegi, ek function use karte h → next()
- Token ko fetch karne ke 3 tariko h →
 - ① header se milta ho
 - ② body me so milta ho
 - ③ cookie me se milta ho
- Cloudinary ek media management service h, jisme sare Images/videos ko upload kar sakte h
- Server se store karne se acha h cloudinary me store karne → [Retrieval and performance achi wayegi]
- ab nigla DB me entry ke bare kuch form ke liye h (Jessa Mail Send ho) so, I use → PostMiddleware
- ab nigla DB me entry ke just table kuch ke liye h to, I use in → PreMiddleware
- Mail send karne ka liye, wo will use → node-mailer
google se documentation se dekhi ke use likhi h mail bhejne ka liye!!

100%.

OOPs

- **Class** - blue print / design का बोत्ह
- **Object** - actual chg / instance of class

class Animal E

Public:

// State or Properties

int age;

String name;

// behaviour or function

void eat() E

cout << "eating"

void sleep() E

cout << "sleeping"

3;

int main() E

// object 2 तरीके से होता है → static and dynamic

// static

Animal ganesha;

// insert

ganesha.age = 12;

ganesha.name = "Lion";

// access

cout << ganesha.age

cout << ganesha.name

ganesha.eat()

ganesha.sleep()

class Animal E

• class Animal E

3;

class class Animal (empty class)

• sizeof (Animal) → ①

class Animal E

Private:

int weight

Public:

int age;

String name;

void eat() E

cout << "eating"

void sleep() E

cout << "sleeping"

3;

// we use getter/setter to access private data member

int getweight() E

return weight

3;

void setweight(int weight) E

this → weight = weight

int main() E

Animal ganesha;

ganesha.setweight(10);

cout << ganesha.getweight();

// Dynamic

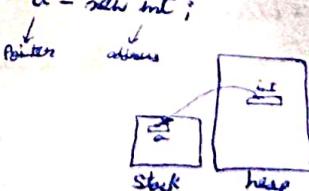
Animal * suresh = new Animal;

suresh → age = 17;

suresh → name = "baby";

suresh → eat();

suresh → sleep();



- 2 memory hole h → stack, stack chota hole h aur heap bda (dynamic memory). Heap me memory allocation karne ke liye new keyword ka use karte h
Jise (new int) likha to us heap me address mil gya ab C++ ne address pointer store karta h to iska likhne ka sahi tarika hoga → int * a = new int;
- heap me allocation - (new) keyword se hote
de-allocation - (delete) keyword se

Reason to make constructor:-

- Take hum initialize karde kuch chije ka use → weight = 0 kijo

- 3 types of constructor hole h :-

① Default constructor

② Parameterized constructor

③ Copy constructor

- Constructor call ke liye class ka same name likhne richtा h

11 extra Gyan → by-default constructor ek bina hoga kota h to ho
dil seki nahi data h, hum yeh boka useko override
karte h

Class Animal E

Private:

int weight;

Public:

int age;

String name;

// default constructor

Animal() {

cout << "constructor called";

this → weight = 0;

};

int main() {

// static case me bhi call hoga

Animal gromesh; // object create karne hi
by-default constructor called
hoga h

// Dynamic case me bhi call hoga

Animal *b = new Animal();

Class Animal E

Private:

int weight;

Public:

int age;

String name;

// Parameterized constructor

Animal(int age) {

this → age = age;

cout << "Parameterized constructor called"

3;

Animal(int age, int weight) {

this → age = age;

this → weight = weight;

cout << "Parameterized constructor - 2 called"

3;

int main() {

// Static

Animal gromesh(10); // aesa constructor dhendo jisme 1
input Parameter Pass hoga ho

// Dynamic

Animal *b = new Animal(50, 100); // aesa constructor
dhendo jisme 2
input Parameter Pass
ho

400

Class Animal E

Private:

int weight;

Public:

int age;

String name;

// copy constructor

Animal(Animal & obj) {

// by reference idhar obj → kyuki copy date to constructor
call hoga use phir copy date to phir constructor
call hoga to see karne karne wo infinite loop
nhi hoga

this → age = obj.age;

this → name = obj.name;

this → weight = obj.weight;

3; cout << "I am inside copy constructor" ;

int main() {

Animal a;

// object copy → (a Animal c(a))

Animal c = a; // Main ya to copy karne ki
Koshish kar raha h to copy
constructor call hoga

• Use of copy constructor:-

by default constructor shallow copy hoga h,
oop shallow copy se backne ke liye deep
copy khud se karne chahte h to deep copy
khud se karne ke liye oops khud ka copy
constructor likhna padta h

★ ~Animal() {

cout << "I am inside destructor";

int main() {

static → Animal a
a.age = 5; // after copy constructor call hoga age

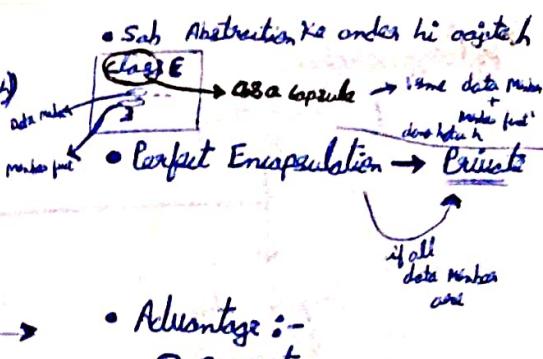
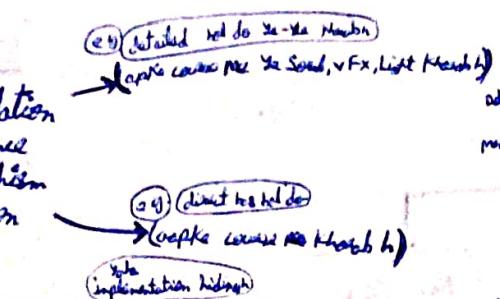
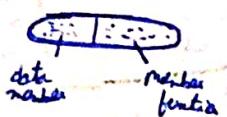
dynamic → Animal *b = new Animal();
b → age = 12;

delete b; // Ya manually hoga delete karne ka
liye

• 4 Pillars of OOPS

- Encapsulation
- Inheritance
- Polymorphism
- Abstraction

① Encapsulation (data hiding)



• Advantage :-

- ① Security
- ② Read only
- ③ Reusability

(to share no
with data
var)

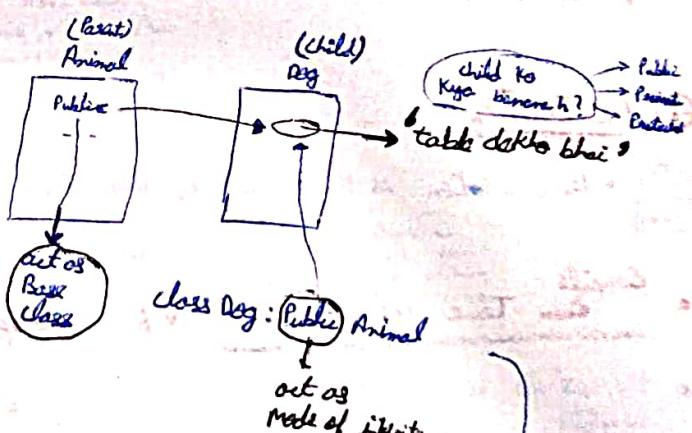
② Inheritance

| Base Class / Super Class / Parent Class | Subclass / Child Class / Derived Class |
|---|--|
|---|--|

⇒ **class child : Parent**

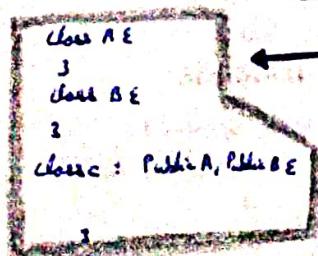
- Mode of inheritance
- ① Public
 - ② Private
 - ③ Protected

| Base class ka Access Modifier | Mode of inheritance | | |
|-------------------------------|---------------------|-----------|------------------|
| | Public | Protected | Private |
| Public | Public | Protected | Private |
| Protected | Protected | Protected | Private |
| Private | NA | NA | NA (not allowed) |

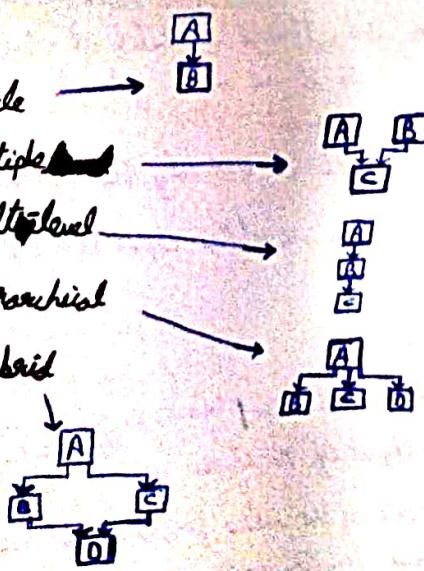


- **Private** - inherit nahi hota h, Koi class ke ander access kar sakte h
- **Protected** - Inherit ho jata h, class ke ander access kar sakte h aur derived class ke ander access kar sakte h

* Types of Inheritance



- ① Single
- ② Multiple
- ③ Multilevel
- ④ Hierarchical
- ⑤ Hybrid



If base class of A is B then
obj A:: member
obj B:: member

Code

Class Animal E

Public:

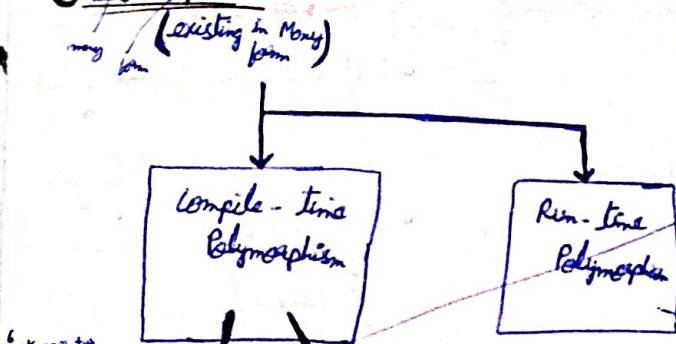
```
int age;
int weight;
void eat();
cout << "Eating" << endl;
```

Class Dog : Public Animal E

```
int main() {
    Dog D1;
    D1.eat();
    return 0;
}
```

→ Eating

③ Polymorphism



operator
overloading

+ ka form - kaaya



function
overloading

Sum func
ER se tyada
hence baki
use func

Answer will be
given according
to the parameters
of object.

class Animal E
Public:
int Sum (int a, int b) {
 return a+b;
}
int Sum (int a, int b + int c) {
 return a+b+c;
}
int Sum (int a, float b) {
 return a+b+10;
}

int main () {
 Animal obj;
 cout << obj.Sum (3, 2, 7);
}

class Animal E

Public:
int val;

void operator+(Param & obj2) {

int value1 = this->val;

int value2 = obj2.val;

cout << (value2 - value1);

3; 3

int main () {

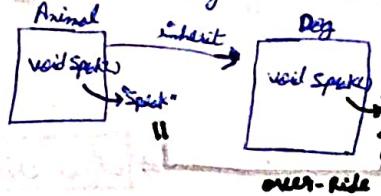
Animal obj1, obj2;

obj1.val = 7;

obj2.val = 2;

// This should print diff.
obj1 + obj2
return 0;
2;

function over-riding



Dyn. obj creation → 4 chj. Someth. lo (Virtual Keyword) ka khol

Parent * a = new Parent();

Child * a = new Child();

Child * a = new Child();

Child * a = (Child *) new Parent();

VSI

overriding / overriding
Study from VS

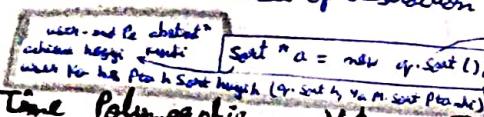
For theory:

• Encapsulation - data hiding hote h

• Abstraction - implementation hiding hote h

④ Abstraction

- Encapsulation is the subset of abstraction



Compile Time Polymorphism

V \$

Run Time Polymorphism

- Call is not resolved by the compiler

• It is achieved by virtual functions

& Pointers

• Inheritance is involved

• all things executed at run time,
so it is more flexible

class Animal E

Public:

void speak () {

cout << "Speak";

3; 3

class Dog : Public Animal E

Public:

override

void speak () {

cout << "Bark";

3;

int main () {

Dog d;

d.speak();

return 0;

3;

- In shallow copy, a copy of the original object is stored and only the reference address is finally copied.

- In deep copy, the copy of the original object and the repetitive copies both are stored

- global variable - can be access anywhere

- Local variable - only be access within the brackets

- Static data members - us class ki static

- Static member function - It is independent of any object of the class.

- Inline function - when inline func is called whole code of the inline function gets inserted/ Substituted at the point of the inline function call.

- Friend - A friend class can access private and protected members of other classes in which it is declared as friend.

- Virtual - Job tomhe kisi derived class me ek function ko override karne hote h.

