Database Management Systems. → softwares used to manage databases.

↳ eg's → MySQL
→ oracle
→ PostgreSQL

① DBMS. → stored in Database.

② Data - collection of small units of info. (tables, views, schema)
- video/audio/text/code, bytes, media,
- can be stored in a electronic medium.

③ Data languages → DDL, DML, DCL, TCL.

Ⓐ Data definition language → How data is defined to be stored in database.
↳ CREATE, ALTER, DROP, TRUNCATE, COMMENT, RENAME.

Ⓑ Data Manipulation Language → deals with manipulation of data once created.
↳ SELECT, UPDATE, INSERT, DELETE

Ⓒ Data Control Language → used to grant/revoke permissions to users in database.
↳ GRANT, REVOKE

Ⓓ Transaction Control Language → basically used in transactions.
↳ RollBack, commit, savepoint

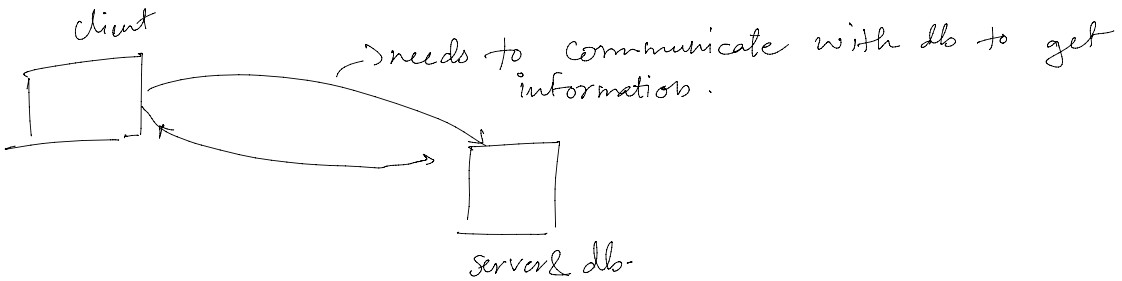
Schema → blueprint of db which defines how data may be related to each other.

Instance → just a snapshot at a moment

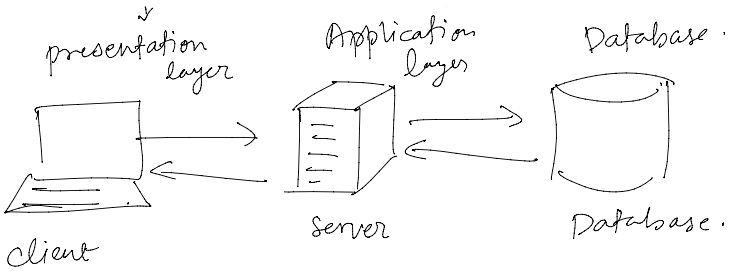
→ 1-Tier architecture → client, server, db all reside on the same machine.
eg → college projects.

→ 2-Tier Architecture → where the presentation layer (ui) runs on a client and data is stored on a server called the second layer.

diff. machines.



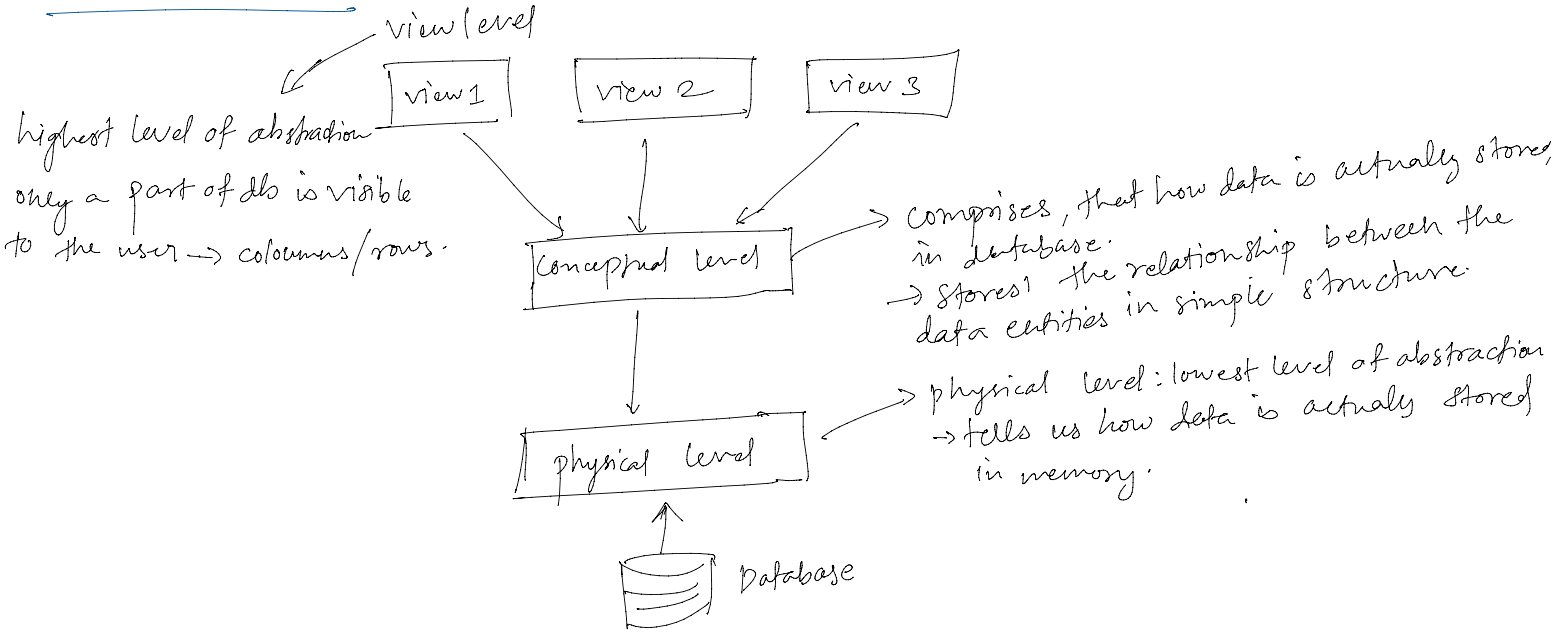
→ 3-Tier Architecture → used in production



Data Abstraction → hiding unwanted info from the client/user.

Cmail → we don't know where data is physically stored.
→ don't know the model/schema of the data.
→ we're not concerned about internal working.

levels of abstraction. → view level, conceptual level, physical level.



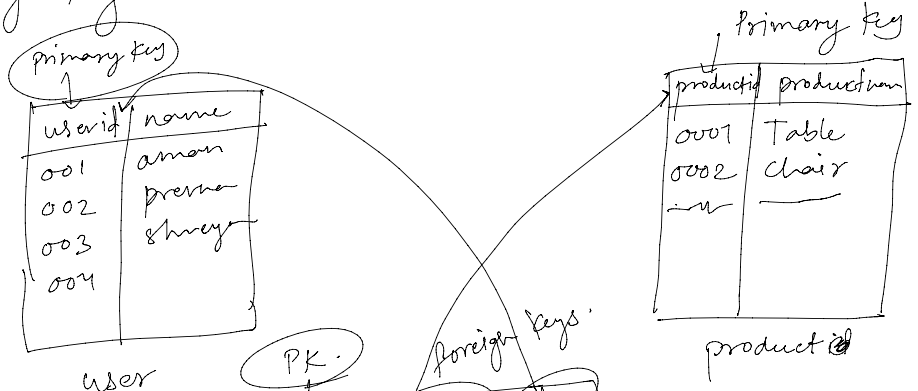
Keys in Database → attributes / set of attributes which helps you to identify a row in a relation.

Primary key → uniquely identifies every row in a table
→ can't have duplicate values, one value can't appear more than once.
→ table can't have more than one primary key.

Rules for PK → (1) PK field can't be null.
(2) two row's can't have the same primary key value.
(3) must for a table to have PK.
(4) PK can't be modified

④ PK can't be modified

foreign key → column that creates relationships b/w two tables.



referential Integrity.
↳ property of data stating that all its references are valid & reliable.

FK → a field in one table that refers to the PK of another table.

Normalization → the process of minimizing redundancy from a relation or set of relations (table).
→ undesirable characteristics ko eliminate karti hai
eg → insertion, deletion, updation.

① 1st Normal Form → a relation is in 1NF if it does not contain any composite or multi valued attribute.

roll no	name	course.
01	aman	maths, physics
02	prerna	java, IOT
03	Shreyas	python.

← violation of 1NF
course contains multi-valued attributes.

Solution 1 :→

roll no	name	course.
01	aman	maths
01	aman	physics
02	prerna	java
02	prerna	IOT
02	"	python

ko milake →
roll + course → primary key

When multiple col's are required to make a primary key → then it's called as composite key.

02	p.	IOT
02	prerna	python
03	shreyas	java
01	aman	

Solution 2:

rollno (PK)	name	course 1	course 2	course 3 ...
01	aman	maths.	physics	java
02	prerna	java	IOT	—
03	shreyas	python	—	—

2NF -> table should be in 1NF.