DBMS

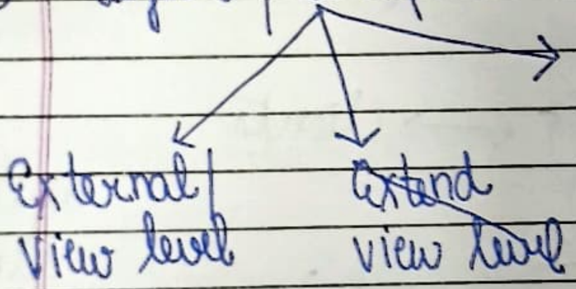
(A) Semi Structured → Key: Value
Structured → Tabular form
Unstructured → Images, audios, videos

(B) Rows → Tupples
Columns →
Single row → record

(C) Registration | roll no. → Primary Key → unique

(D) Abstraction

(E) Logical | Conceptual level → data in tabular form



(F) Physical level → raw form date, no relation

(G) External level → Abstraction

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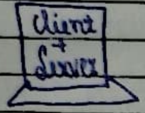
NOTE BOOKS

DBMS Architecture

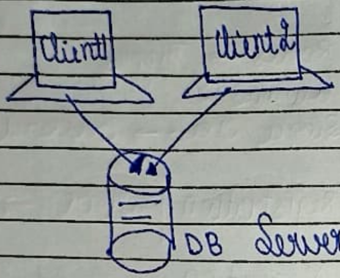
(A) 1-tier

+ SQL



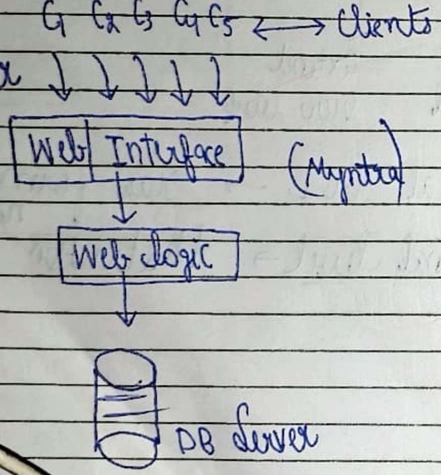
- Same machine
- Min. latency
  ↓
  delay
- no Security

(B) 2-tier → multiple Clients but fixed



- From diff machines, directly accessing the DB

(C) 3-tier



multiple Clients

- no. of clients, load not fixed

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NOTE BOOKS

IoT lab

Experiment 1 → 30/6/25
Sub → 7/7/25
Experiment 2 → 7/7/25
Sub → 14/7/25

40mA → max Current limit of Aurdino

Operating voltage → 5V
Input voltage → 7-12V

Out of 14 pins 6 pins → generating ~~PMW~~ PWM
↓
Pulse width modulation

D3, D5, D6, D9, D10, D11

Three memory
flash → 32KB
FRAM → 2KB
FROM → 1KB

Serial protocol
I2C protocol
SPI protocol

Vin
GND (Ground)

Serial monitor → debugging tool
Communicate directly with Aurdino board

eg: → for 1 time on/off LED

[void setup
void loop] Bare minimum Code

↓

without these, codes will not run

eg: for continuous on/off for LED

① delay(1000) → time in milliseconds

② Starting code → Serial.begin(9600)

③

Serial monitor

```
setup()
Serial.begin(9600)

loop()
Serial.println("hello chitkara")
delay(1000);
```

Thursday
10 July, 2025

DBMS

Integrity Constraints → rules

- Domain Constraint
- Entity Integrity Constraint
- Key Constraint
- Referential Integrity Constraint

Domain Constraint:

Varchar will not count space.
Char will count space

↓

The data types should be same i.e int → roll no.'s, character should not be included in int

Entity Integrity Constraint:

↓

- Primary Key Value should not be null.
- Values will be unique
- do not update Primary Key

Rules of Primary Key

Referential Integrity Constraint:

↓

b/w tables which ID's are same are called (foreign Keys FK)

Connectivity

Common

- FK helps to connect 2 tables

If using FK concepts, In child table entry is there but in parent table it is not there, It is not accepted. But in parent if it is there & in child not, it is accepted

FK

Course Key	Course Name
101	BTech
102	BBA
103	MBA

Course Key ↓ Primary Key

↓ Parent

STD	Name	Course ID
1	Prerika	101
2	ABC	102
3	XYZ	101

→ Child

STD ↓ Primary Key

Key Constraint

Candidate Key] In these Keys we
Alternate Key] have attributes

These must be unique.
NO duplicacy

Super Key - You need to take attributes which identify data uniquely.

Single- {SID} { RegID} {Email}, { Aadhar}

or you can take Combinations -

{SID, Name} {SID, Email}

{RegID, Fee, Name}

→ derived from Super Keys

Candidate Key - Find from super Keys

{SID} {RegID} {Email} {Aadhar}

{Sid, Name} X → Cannot be repeated as we have taken SID

Primary Key

↓
should be only 1

{SID}

Alternate Key

↓
All other left are alternate Keys

{RID} {Email}

{Aadhar}

#

CustomerID	Product ProjectID	OrderID
C_1	P_1	O_1
C_1	P_2	O_1
C_2	P_{11}	O_2
C_2	P_2	O_2

In this, no unique attribute is there

Composite Key - When no unique attribute is there concept of Composite Key is introduced.

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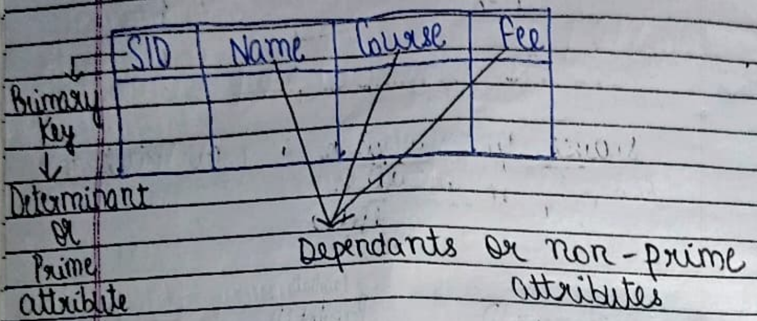
Friday

Functional Dependency → tells how attributes depend on each other.



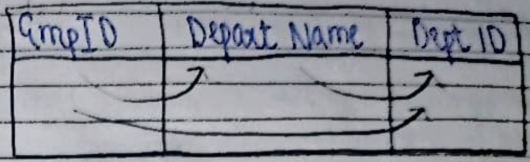
① **Full Funct. Dependency:** Ki ek table me ek attribute hai which helps to find other attributes & if this attribute gets deleted, dependency of other attributes gets deleted.

② **Partial Funct. Dependency:** Ki ek table me 2 attributes hai which helps to find non-prime attributes. (Apart of primary key, there is the attribute)

Case Trivial FD {Sid, Name} but here name can be a dependant also.
↓ Determinants
↓ means both determinant & dependant

x → y
y → z
x → z

③ **Transitive Funct. Dependency:**



Attributes ~~are~~ are in such a way that they can find attributes within themselves (Interlinked)

④ **Multi Value FD:** → Duplicacy within primary key

EmpID	Dep. Name
E1	Btech
E1	BCom

Primary Key

Trivial - {Sid, Name}
↓
Both determinant & dependant

# Non-trivial - Dependants cannot be part of determinants
{SID}

17July, 2025
Thursday

Data Models

- DDL
  Data Definition language
  ↓
  • for structure of table
- DML
  Data Manipulation lang.
  ↓
  • for data i.e change, delete
- DCL
  Data Control lang
  ↓
  • for permissions
- TCL
  Transaction Control lang.
  ↓
  • for transactions.

① DDL - Commands:
Create → datatype
Alter → to delete any column or add, rename or change datatype
Drop → to delete full table
Truncate → If we dont want to delete full table but any particular column
← Rename

② DML - Commands:
Insert →
delete → rowwise delete data
Update → update particular attribute
Select → Agar table wale form me data dekhna hai

③ DCL - Commands:
Grant → Giving permissions
Revoke → Take permissions back

user① → Insert
Update
user② → Select

Transactions start with Start & ends with Commit

④ TCL - Commands:
Commit → helps in completion of transaction ↑ (→ last step)
Rollback → Because of any error or wish if we dont want to do transaction then amount is sent back to account (in processing state)
Savepoint

Start
-100
-200
-550
+5000
Savepoint S₁
-10000 → Processing
Rollback to S₁ → This will skip the processing part (i.e. 10,000 wali payment nhi hogi)
Commit

↳ This will save above transactions otherwise we need to start from start again.

Practical

data
① To see databases → show databases;
② To Create → Create database db2 ; → delimeter
(db2 ↑ name)

③ Create table inside database → use db2;
④ Check table list → show tables;
⑤ Create table → Create table g20 (name varchar(20), Sid int primary key, branch varchar(30));
(g20: name)
(Structure)
⑥ See table → describe Command → desc g20;

by default same sequence will be followed

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NOTE BOOKS

(7) To put data → insert into g2o values ('riya', 1, 'CS');
(first method)

(8) To see data → select * from g2o;

(9) To put data → insert into g2o (name, sid) Values ('siya', 3);
(second method)
to not follow Sequence

or

insert into g2o values ('riya', 1, '');