

⇒ Drawbacks of file system

- ① data redundancy and data inconsistency
 ex hae ~~3/8/8/8~~
 data bhoot
 jagah pr.
 ex data multiple location
 pr cur 1 ki value aag
 ho aur 2nd ki na kro

- ② Difficulty in accessing data. } excel ma kush ho jata
 pr agr zaidi complex
 aya tou ni hoga.

- ③ Data Isolation → data might be separated or kept apart from each other.

- ④ Integrity problems → ofke ~~1/1/1~~ 1 constants by e.g., ek
 din ma 2 transactions kr skty. Ya
 database ma easy hta.

- ⑤ Atomicity problem → any operation either happens completely or not at all. For example,
 Transferring money, but money cut
 but we do not receive on other end.

- ⑥ Concurrent Access Anomalies → ek ya bhoot zaidi lag
 process data at same time.

- ⑦ Security problem

⇒ Acid Property

Atomicity

Consistency

Isolation

Durability

(kisi transaction ki wajah se dori kharab na ho)

(data changes are safely stored and will not be lost even if there is power outage.)



OLAP → used for analyzing data in real-time.

Schema → tells how data is organized and represented.

Date: _____

⇒ TYPES OF DATA.

Structured

- Well organized
- often contains numbers

Examples

- name, dates, addresses, credit card number, ATM, phonebook

Semi-structured

- Organized to some extent

~~HTML, XML, JSON, etc.~~
emails.

Non-relational or NoSQL

Unstructured

- Not stored in database

Examples

- text, audio files, video files, facebook customer reviews.

⇒ TYPES OF DATABASES

SQL (Structured query language)

- SQL are structured

~~HTML, XML, JSON, etc.~~

- Tabular format
- Not easily scalable

NoSQL (not only SQL)

- used for big data
- Schema-less database

Lecture 13

⇒

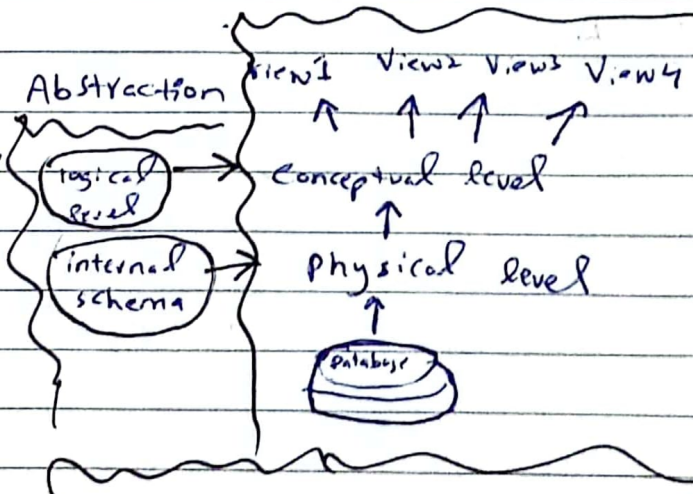
DBMS

DBMS

→ Agr 1 ~~DBMS~~ hoo cur redundancy, inconsistency
Zaida ho tou phr 2 DBMS bana soo.

⇒ View of data / Data Abstraction

- Physical level How data actually stored?
- Conceptual level
- View level.

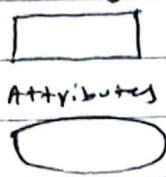


ER Diagram

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Entity set

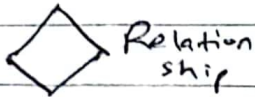
Weak entity set



Attributes



Multi-valued attribute



Relationship



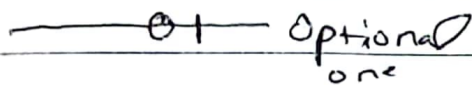
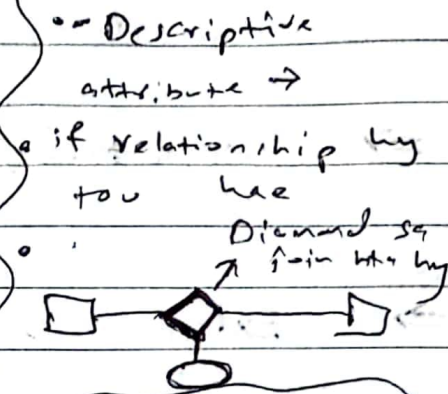
Identifying relationship



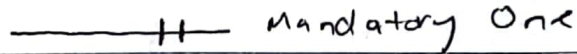
Derived Attributes



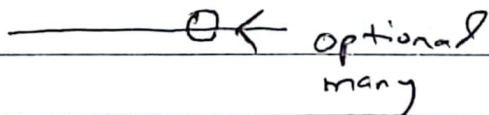
Link



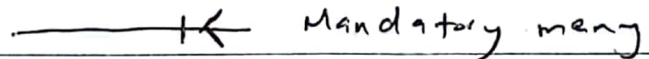
Optional one



Mandatory One



optional many



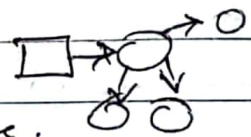
Mandatory many

⇒ Attributes

- Simple attribute → can not be divided.
- Composite attribute → consists of more than one simple attribute.



- Single-Value attribute → only one attribute.



- Multi-valued attribute → • more mobile number so



- Derived attributes → koi ki base pr derag ko derived.



- Key attribute → jing hamara roll-number ky.
- underline key attribute.

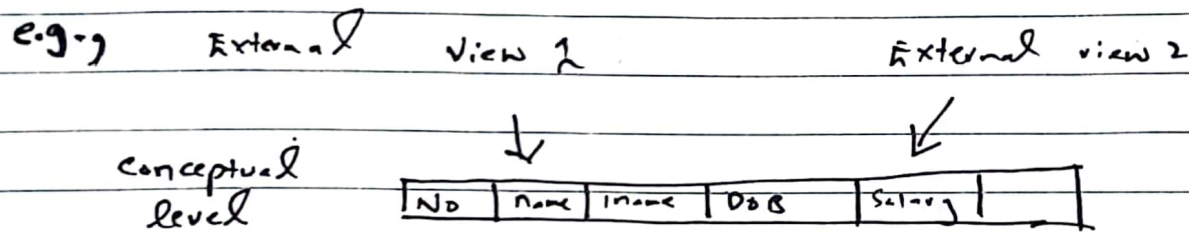


Date: _____

⇒ **Physical level / Internal level**
• - How data actually stored. (coding)

⇒ **Conceptual / Schema / logical level**
• - What data is stored in database & their relationships.
• - ER diagram

⇒ **External level / subschema / View level**
• - Only part of database can be viewed.
• - Database has many views.



DATA MODELS (class diagram)

• - Data model operations → • basic model operations (delete, update)
• user defined operation (cgpa, marks)

⇒ **Conceptual data models / high-level / semantic / Entity based**
• Concepts that are close to many user to perceive data.

⇒ **Physical data models / low-level / internal**
how data is stored.

⇒ **Implementation data models / representation**
falls b/w above 2



Constraint \Rightarrow restriction on the data. (helps in data integrity)
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TYPES OF Data Model

- Object based \rightarrow describe data at conceptual and view levels.
 - ER model.
- Record based logical model \rightarrow ~~logical~~
 - Relational model
 - Hierarchical model
 - Network model.
- Physical data model \rightarrow lowest data of abstraction

Types of entities

- Tangible \rightarrow physical occurrence e.g., person, product.
- In-Tangible \rightarrow no physical occurrence e.g., ~~book~~ course.

RELATIONSHIPS

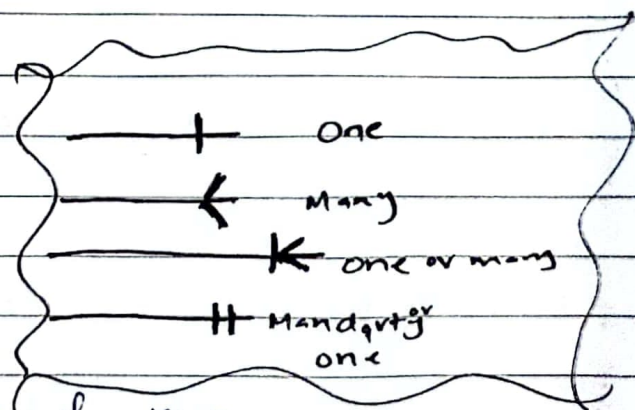
- one-to-many (relationship where record in one entity is associated with exactly one record in another)
- many-to-many
- one-to-one

\Rightarrow Schema

- Complete designs of database
- also called as intension.

\Rightarrow Database State

- database at particular moment of time
- also called as extension.



- Minimum number of tables required to represent this E-R model?

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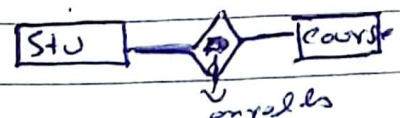
⇒ Degree of Relationships

-- Unary (one entity)



- relationship b/w 2 entities of same type
- reflexive relationship

-- Binary (two entity)



-- Ternary (three entity)



⇒ M:N relationships (many to many)

- Must be avoided b/c they lead to data redundancies
- Can be implemented by breaking up to produce a set of 1:M relationships.
- Avoid by creating composite or bridge entity.

⇒ Relationships Constraints

- Cardinality Ratio → max number of relationships instances that an entity participate in
 - 1:1
 - 1:M
 - M:1
 - M:N

• Participation Constraints →

-- Total participation → if every entity (represented by double line) participates in at least one relationship

-- Partial participation → if some entities (represented by single line) participates.

