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DBMS Designing and ER Modeling

Complete Course on Database Management System

Vishvadeep Gothi • Lesson 2 • June 17, 2023

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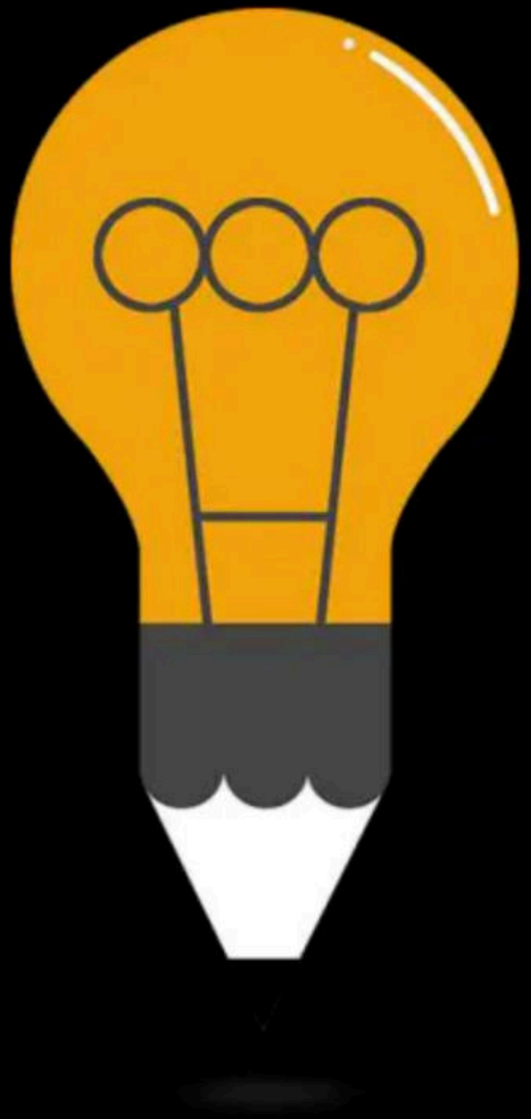

VD's spartan file

DBMS
Introduction & Database Design

By: Vishvadeep Gothi

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DBMS

A database-management system (DBMS) is a collection of interrelated data and a set of programs to access those data.

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But Why DBMS?

Disadvantages of File System:

1. Data Redundancy and Inconsistency
2. Difficulty in Accessing Data
3. Data Isolation
4. Integrity Problems
5. Atomicity Problems
6. Concurrent-Access Anomalies
7. Security Problems

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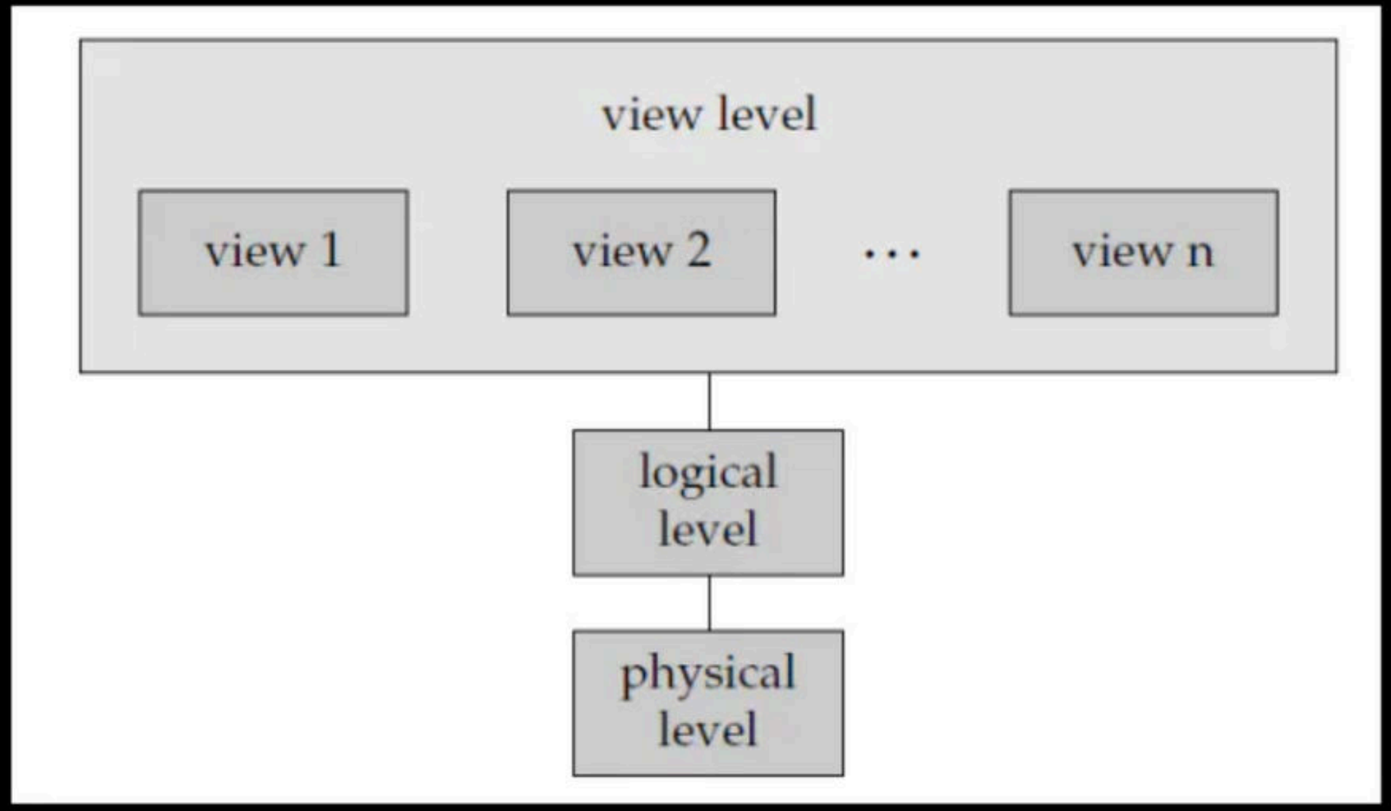
View of Data

1. Physical Level
2. Logical Level
3. View Level

View of Data



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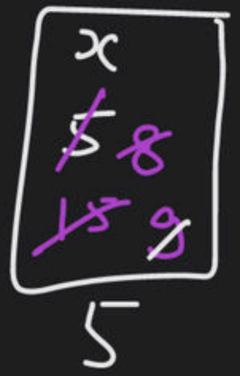
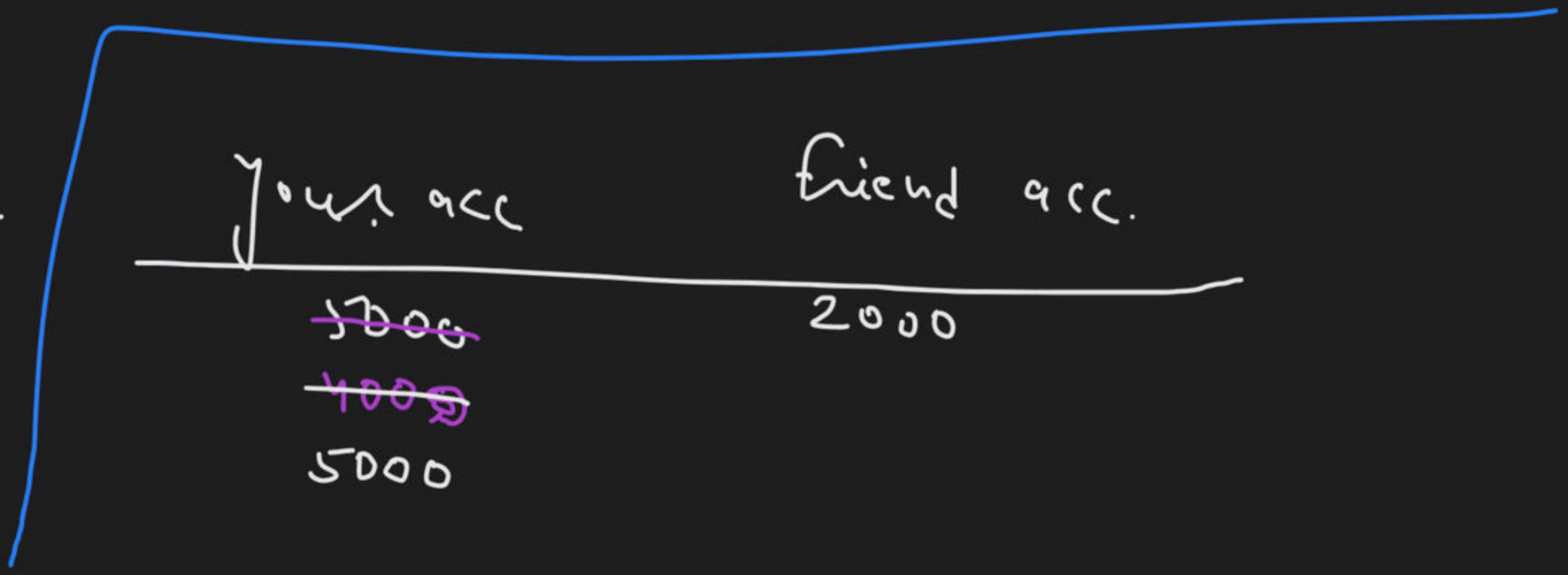
→ Commit

→ rollback ⇒ The db changes can be reverted to previously saved state.

a b c d





NULL ⇒ is a representation of no any value present

student

Rno	name	Phone-no
1	Amit	1234
2	Rohit	3456
3	Anita	NULL

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Instance and Schema

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Database Languages

1. Data-Definition Language (DDL) → working on d.b. design
   - → creating, deletion tables,
   - → updating column name
   - → deleting column
   - → adding new column
2. Data-Manipulation Language (DML) → working on data
   - → insert
   - → update data
   - → delete data
   - → fetching data

student

Rno.	name	dob
1	Riya	- - - -
2	VD	27 Oct
3	—	~~Jan~~

2 Feb

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Database Languages

1. Data-Definition Language (DDL)
2. Data-Manipulation Language (DML)
   I. Procedural DMLs
   II. Non-procedurals (Declarative) DMLs

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Database Languages

1. Procedural DMLs:

   Require a user to specify what data are needed and how to get those data

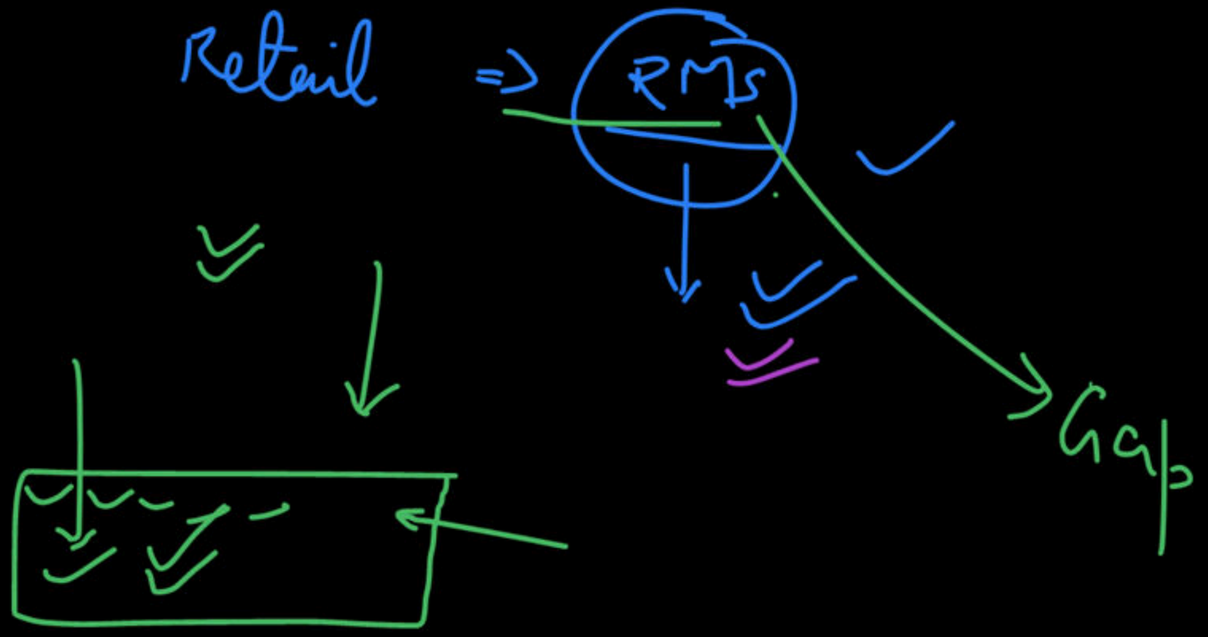
2. Non-procedurals (Declarative) DMLs

   Require a user to specify what data are needed without specifying how to get those data

   ex :- SQL

Database Users and Admins

1. Naive users
2. Application programmers
3. Sophisticated users
4. Specialized users
5. Database Administrator



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Database System Structure

The functional components of a database system

1. Storage manager
2. Query processor components

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Data Model

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Data Model

A collection of conceptual tools for describing data, data relationships, data semantics, and consistency constraints

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Data Models

1. The Entity-Relationship Model
2. Relational Model

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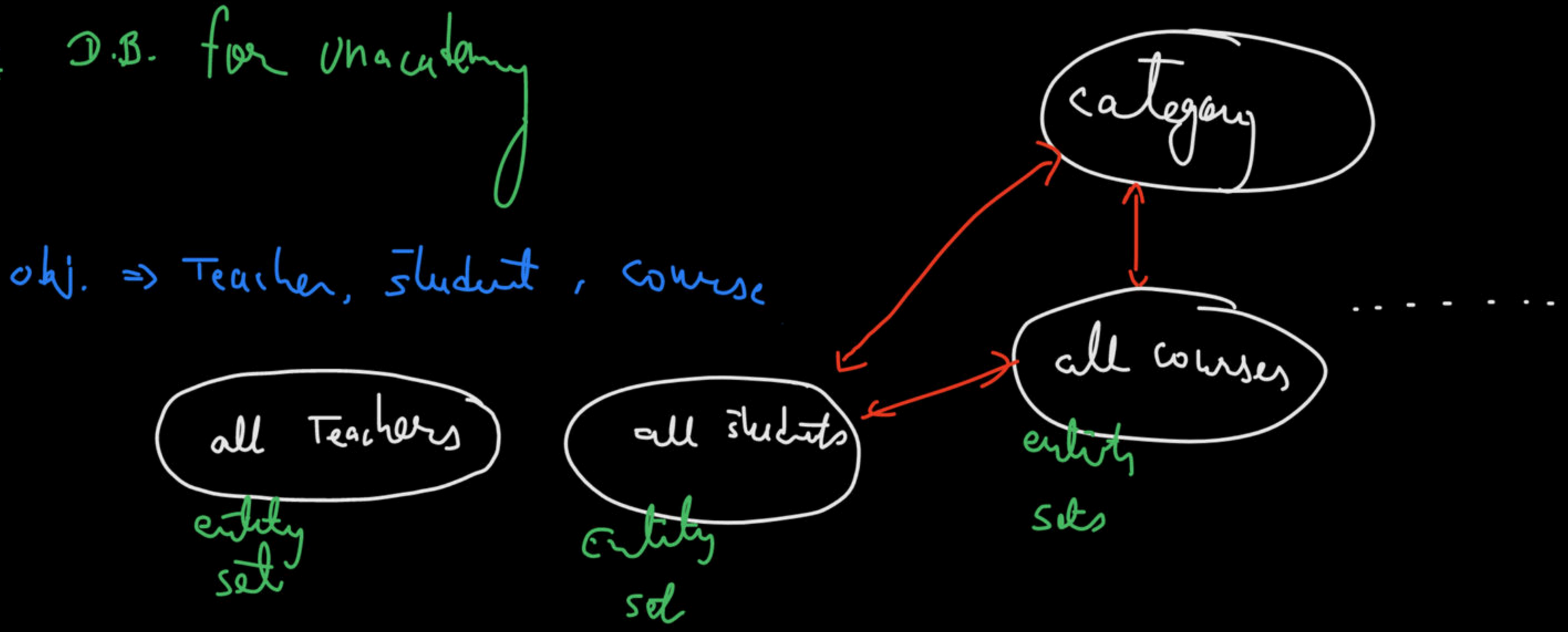
The Entity-Relationship Model

The entity-relationship (E-R) data model consists of a collection of basic objects, called entities, and of relationships among these objects



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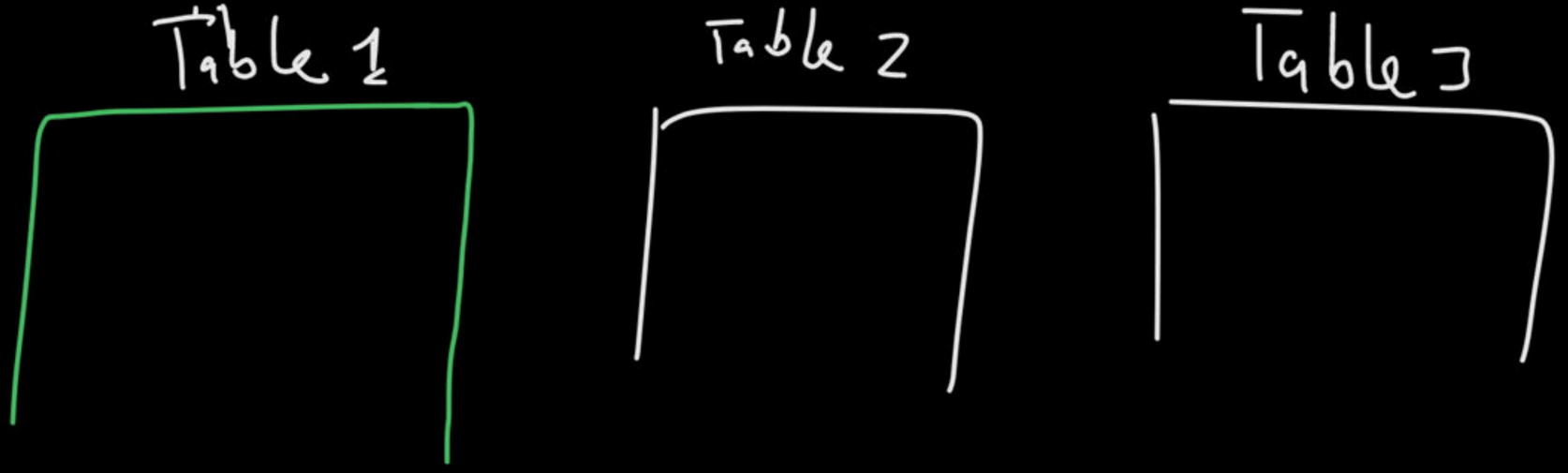
Relational Model

The relational model uses a collection of tables to represent both data and the relationships among those data.



DB based on relational model => RDBMS

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Other Data Models

1. Object-oriented data model
2. Network data model
3. Hierarchical data model

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Database Design

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Database Design

1. Requirement Analysis
2. Conceptual Database Design → E-R modeling
3. Schema Refinement → E-R to relational & refinement
4. Logical Database Design → Use DB tool & make db
5. Physical Database Design → decisions related to physical level of db (ex:- Indexing)
6. Security Design

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Happy Learning.!