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Introduction to DBMS

Complete Course on Database Management System

Vishvadeep Gothi • Lesson 1 • June 16, 2023

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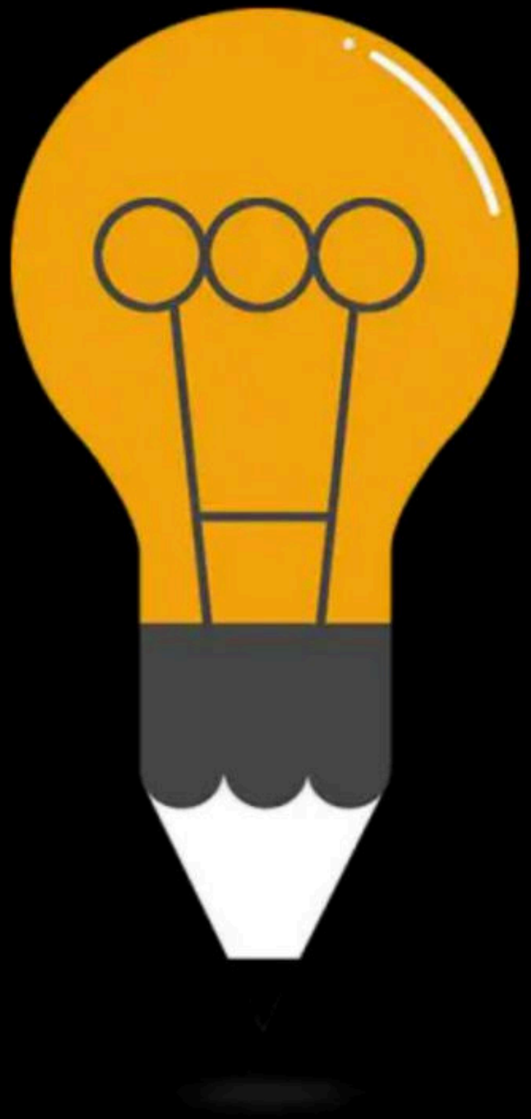

2:30 pm special class → link ↓ pinned up

DBMS

Introduction

By: Vishvadeep Gothi

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Vishvadeep Gothi

- **GATE Ranks:**
  - 682 (2009) – 3rd year
  - 19 (2010) – 4th year
  - 119, 440 etc.
- **Education:**
  - ME from IISc Bangalore
  - Mtech from BITS-pilani in Data Science
- **Work:**
  - 15+ Year Teaching Experience
  - 12+ in GATE/IES (GateForum, Gate Academy, ACE)
  - Worked in Cisco, Audience Communication
- **Professions:**
  - Freelance S/W developer
  - Educator
  - CrossFit Trainer

→ 2 hours lectures → daily revision

→ dpp

-> every 4th class → doubt class & dpp ? next lecture

Every - weekend => Revision

Course finish => detailed Revision

Topics & chapter finished => PYQs

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Course Structure

Topics
Basics
DBMS Designing
E-R Modelling
Relational Database Design
SQL
Relational Algebra
Transaction & Concurrency
Indexing

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Data

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Database

The collection of data, usually referred to as the database, contains information relevant to an enterprise.

DBMS => DB + collection of progs to access D.B.

↓

s/w tool

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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.

mySQL

oracle

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DBMS

Goal of DBMS:

1. Providing a way to store and retrieve database information that is both convenient and efficient.
2. Ensuring the safety of the information

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DBMS

“Information is important for most organization”

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DBMS

“Information is important for most organization”

What should we do as CS experts??

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DBMS

“Information is important for most organization”

What should we do as CS experts??

Develop a large body of concepts and techniques for managing data

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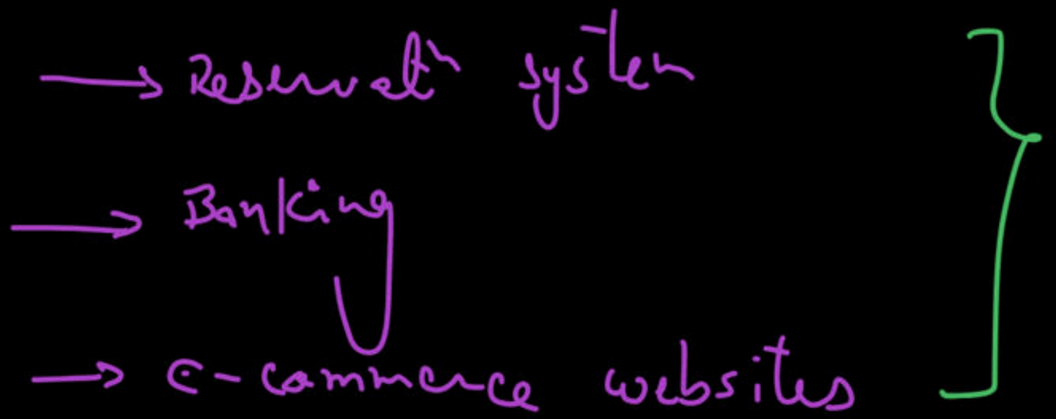
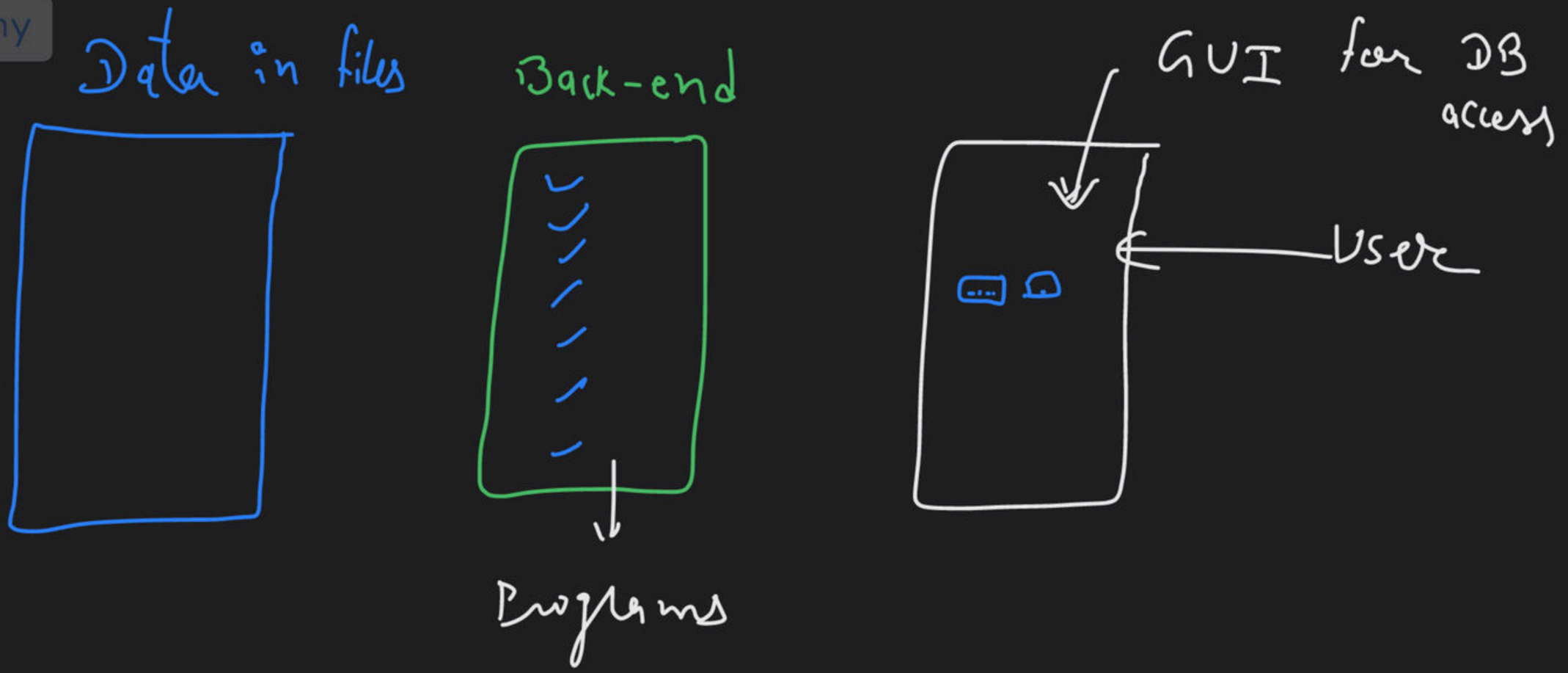
DBMS Applications

Needed for Data science and machine learning also





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But Why DBMS?

—> Before DBMS, data were stored in files.

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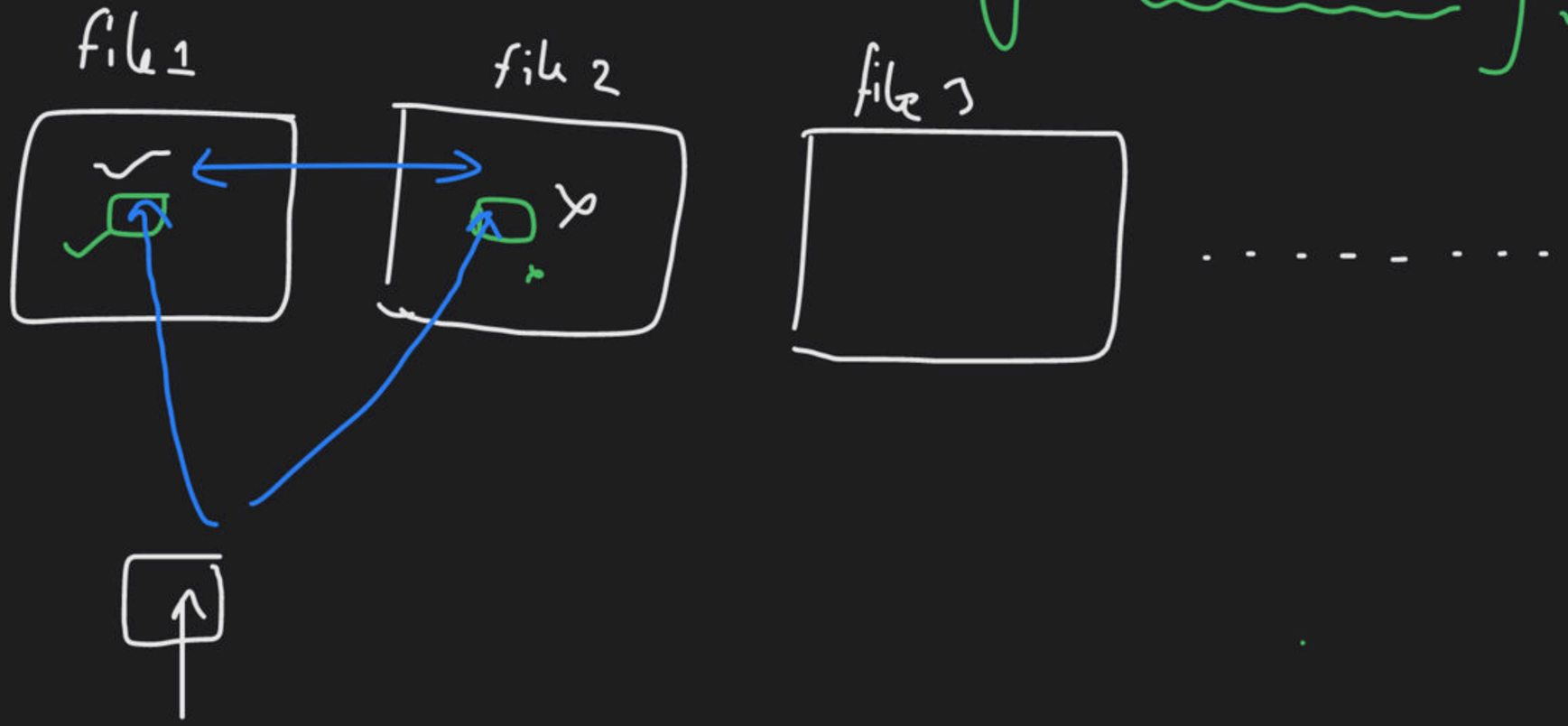
But Why DBMS?

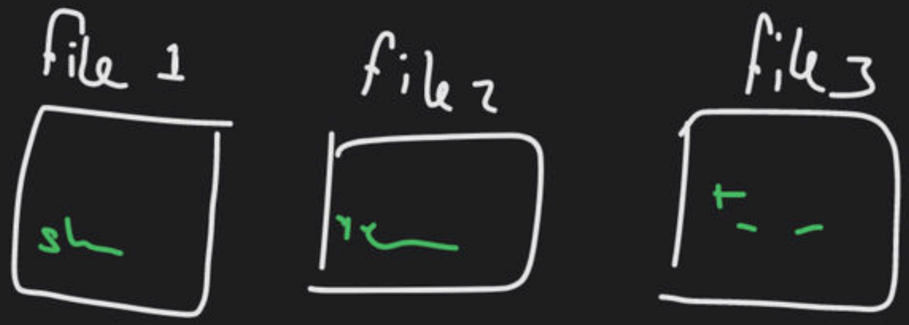
Disadvantages of File System:

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

Data Redundancy & inconsistency -



Difficulty in accessing data



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Data isolation

Different format of files, then accessing data becomes difficult.

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Integrity constraint problem

- either big loops
- or not possible

} in files

No duplicate

Not empty

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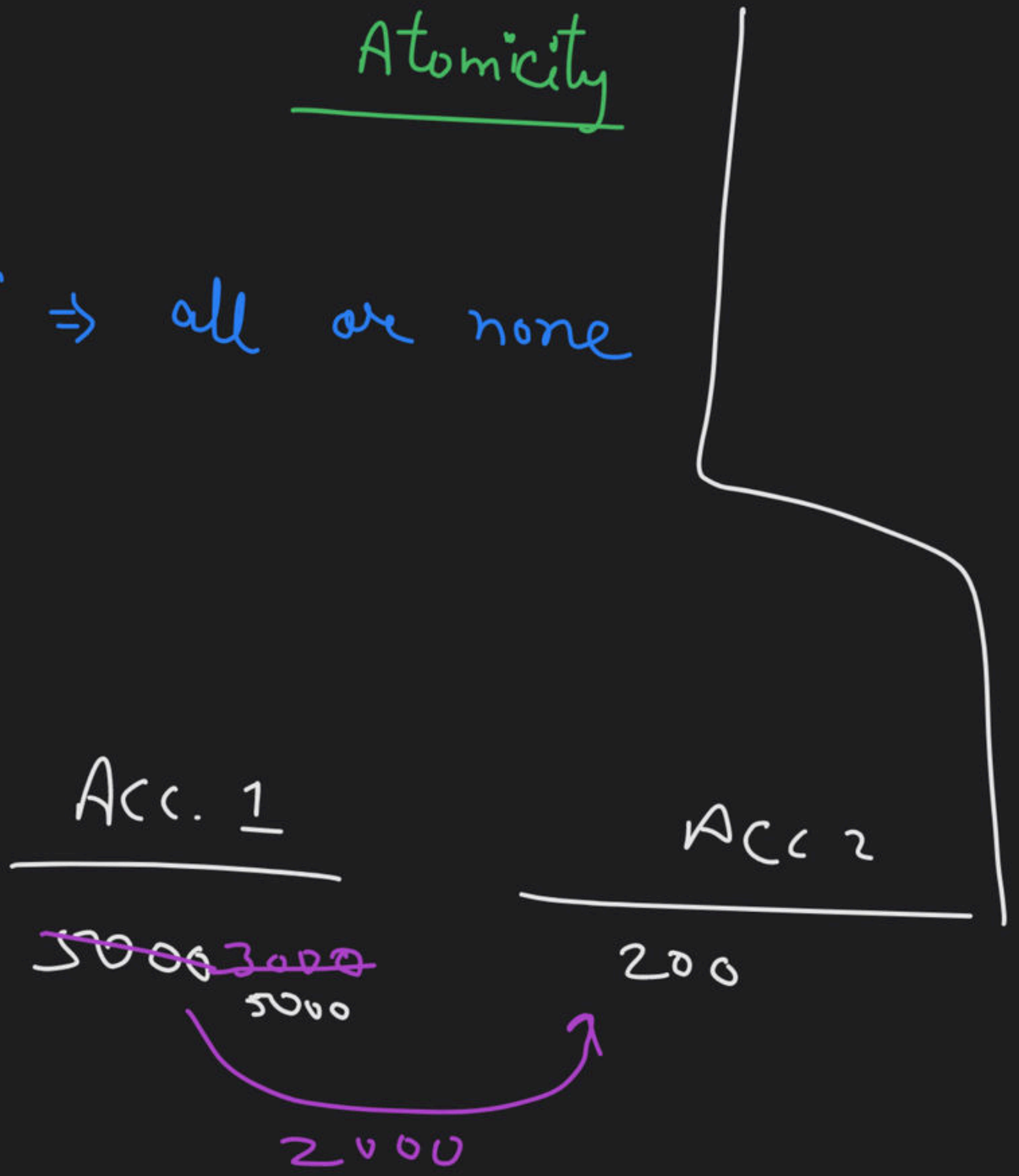
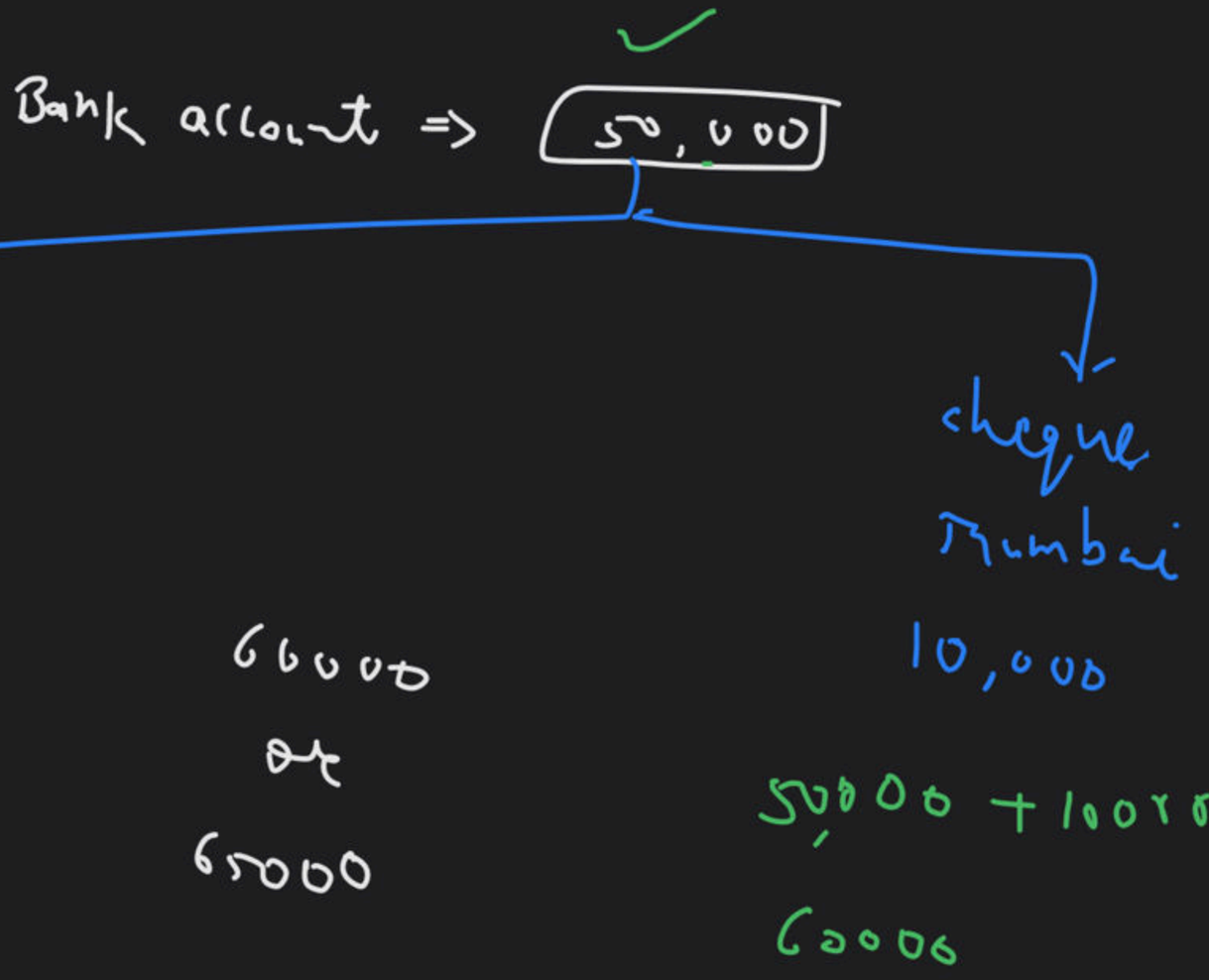
Atomicity

Atomic operation ⇒ all or none



Concurrent - Access Anomalies



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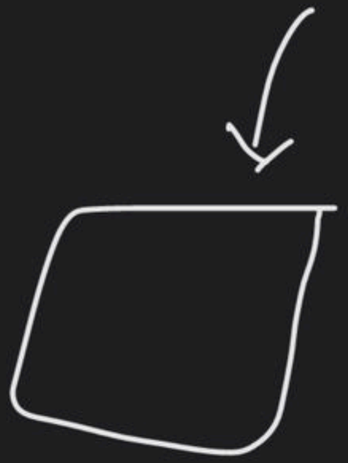
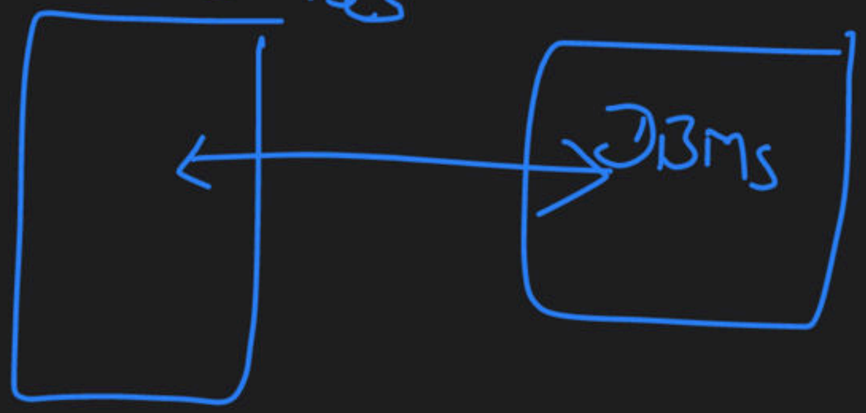
security

↳ file system

not secured



D.B. files



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Instance and Schema

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Database Languages

1. Data-Definition Language (DDL)
2. Data-Manipulation Language (DML)

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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

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Database Users and Admins

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

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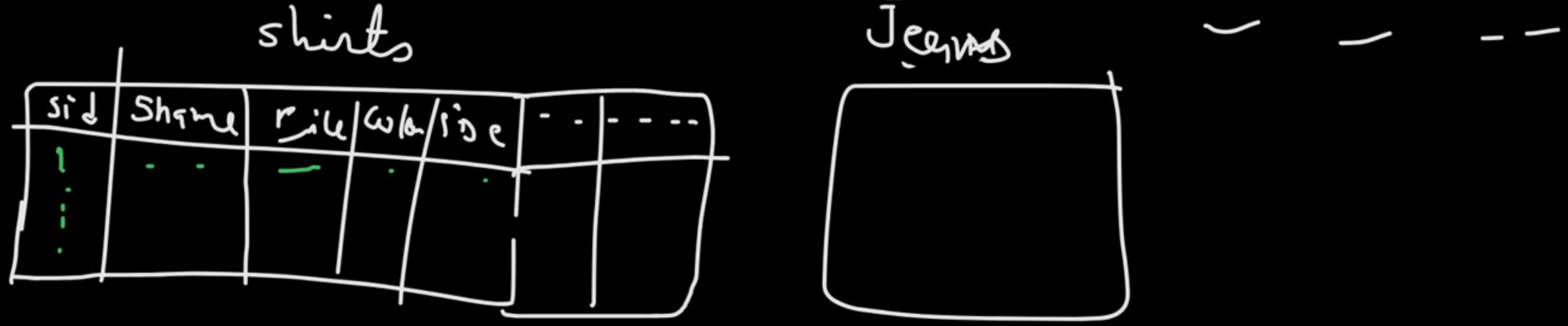
View of Data

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

Database ⇒ collectn of Tables

ex:- E-Commerce website D.B.



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View of Data

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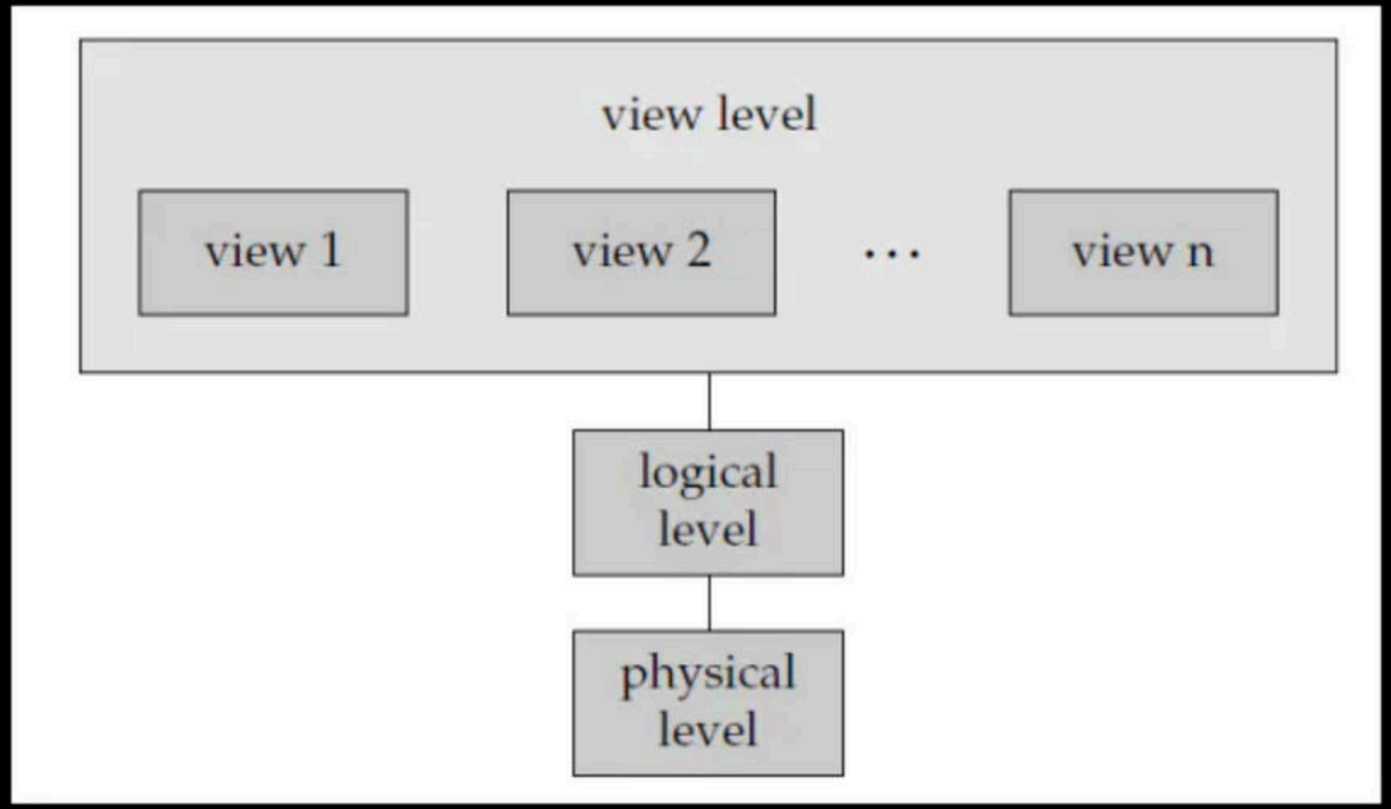

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Database System Structure

The functional components of a database system

1. Storage manager
2. Query processor components

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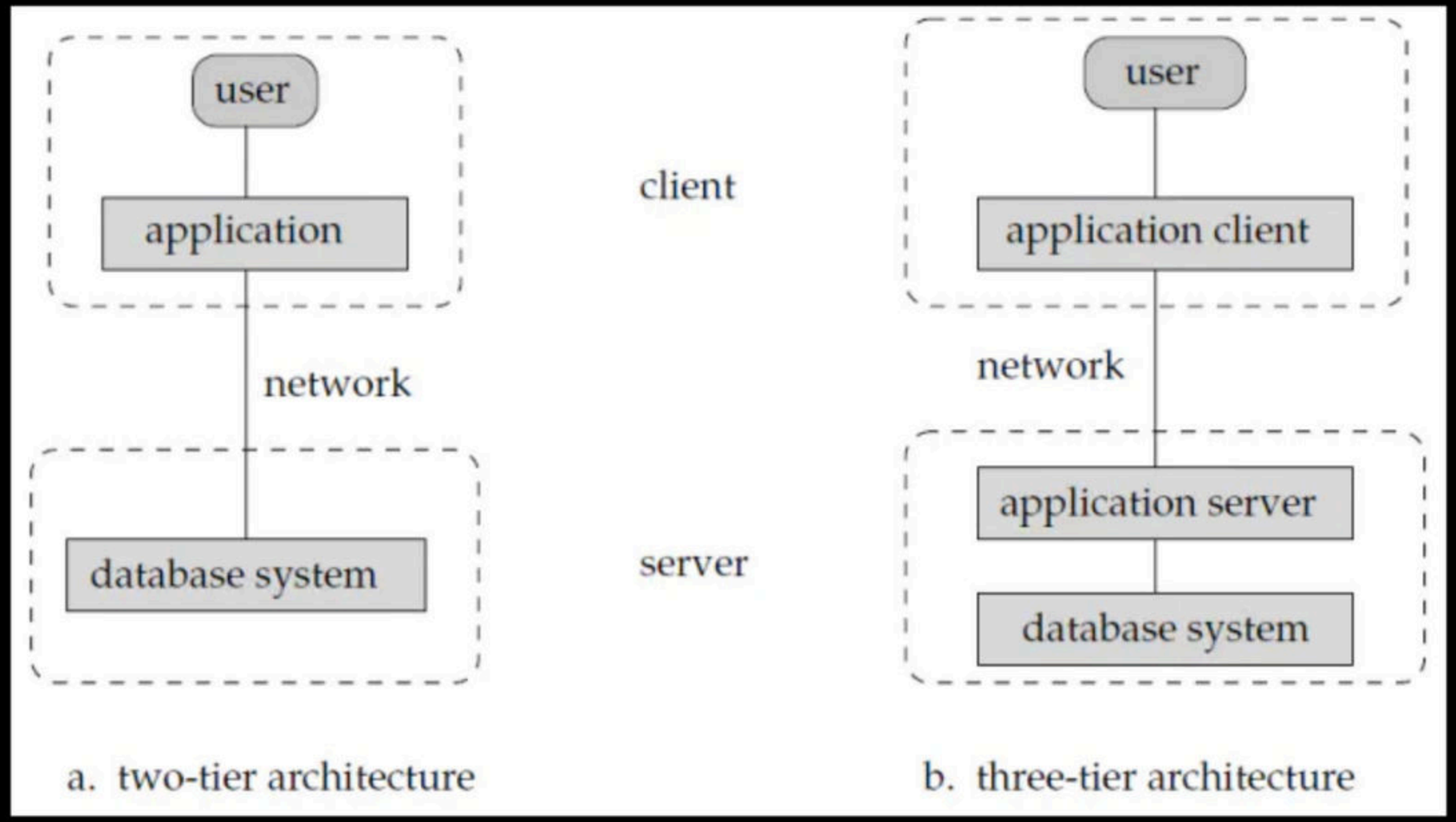
2-Tier & 3-Tier Architecture



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Happy Learning.!