Database Systems(2)

Tutorial 1

DR. ALYAA HAMZA

ENG. ESRAA SHEHAB

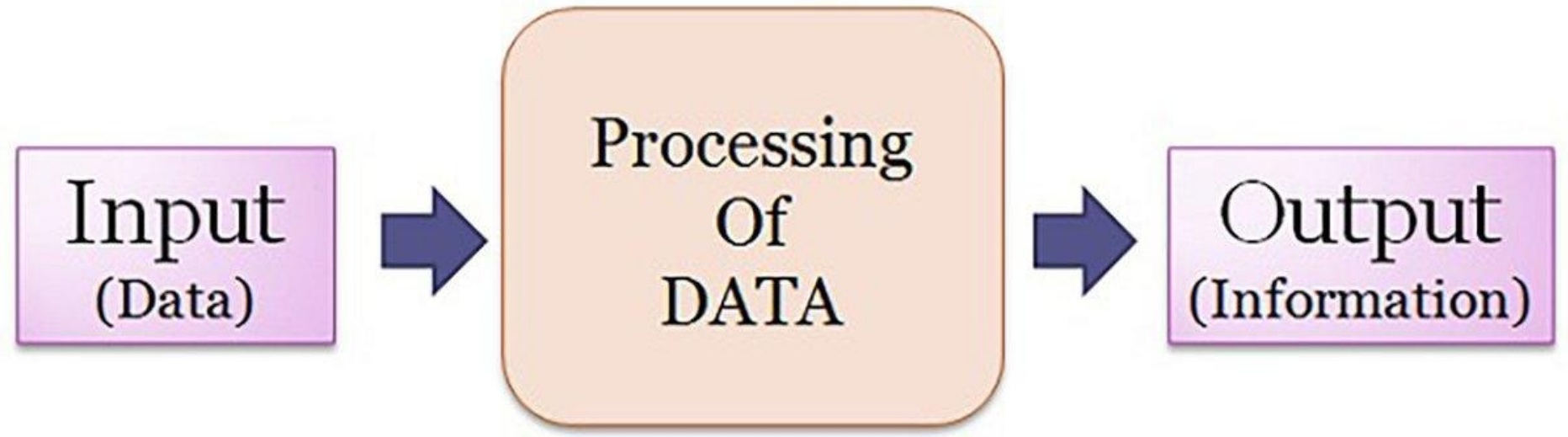
Grades (COM 360):

30 marks (Course Works):

3 marks – Attendance
8 marks – Assignments
8 marks – In class Quizzes
9 marks – Project/ Research
2 marks – Self Learning (Online Quizzes)

20 marks – Midterm
50 marks – Final Exam

1. Data vs Information:



2. What is a database systems:

A database is an organized collection of structured information, or data, typically stored electronically in a computer system.

A database is usually controlled by a database management system(DBMS).

3. What is a database management systems(DBMS):

- *A database typically requires a comprehensive database software program known as a database management system (DBMS).*
- *A **DBMS** serves as an interface between the database and its end users or programs, allowing users to retrieve, update, and manage how the information is organized and optimized.*

4. What is a meta-data:

- *Often referred to as data that describes other data, metadata is structured reference data that helps to sort and identify attributes of the information it describes*

- *Metadata summarizes basic information about data, which can make it easier to find, use and reuse instances of data.*

- *For example, author, date created, date modified, and file size are examples of very basic document file metadata.*

5. What four main types of actions involve databases ?

1. Defining a database: It includes the data types, structures and constraints of the data must store in the database.

2. Constructing the database: It is the process of data storing on some storage medium that is maintained by the DBMS.

3. Manipulating a database: It includes functions such as retrieve the database by using query , updating the database to reflect changes in the system and generate reports from the data.

4. Sharing a database: It allows multiple users and programs to access the database simultaneously.

6. How traditional file systems differs from database ?

- *The structure of a file system is simple whereas the structure of a database is complex.*
- *The redundancy in file system is high than of a database.*
- *The data in a file system can be inconsistent. When the data is in multiple places and if it is necessary to do a change, then must check the entire system to update. In a database, it is only necessary to do one-time updates. Other data will update automatically.*

6. How traditional file systems differs from database ?

- *The data sharing is difficult in a file system because the user must find the location of the file, but it is an easy process when using a database.*
- *A file system is not very secure. On the other hand, using a database is more secure.*
- *A database provides backup and recovery when required.*

7. What are the different types of database end users?

1. Database Administrator (DBA) :

- *Database Administrator (DBA) is a person/team who defines the schema and then*
- *Create a new account id and password for the user if he/she need to access the database.*
- *DBA is also responsible for providing security to the database and he allows only the authorized users to access/modify the data base.*

7. What are the different types of database end users?

2. Naive/Parametric End Users:

- *Parametric End Users are the unsophisticated who don't have any DBMS knowledge, but they frequently use the database applications in their daily life to get the desired results.*

3. System Analyst:

- *System Analyst is a user who analyzes the requirements of parametric end users. They check whether all the requirements of end users are satisfied.*

7. What are the different types of database end users?

4. Sophisticated Users:

Sophisticated users can be engineers, scientists, business analyst, who are familiar with the database. They can develop their own database applications according to their requirements. They don't write the program code, but they interact the database by writing SQL queries directly through the query processor.

5. Database Designers:

Database Designers are the users who design the structure of database which includes tables, indexes, views, constraints, triggers, stored procedures. He/she controls what data must be stored and how the data items to be related.

7. What are the different types of database end users?

6. Application Program :

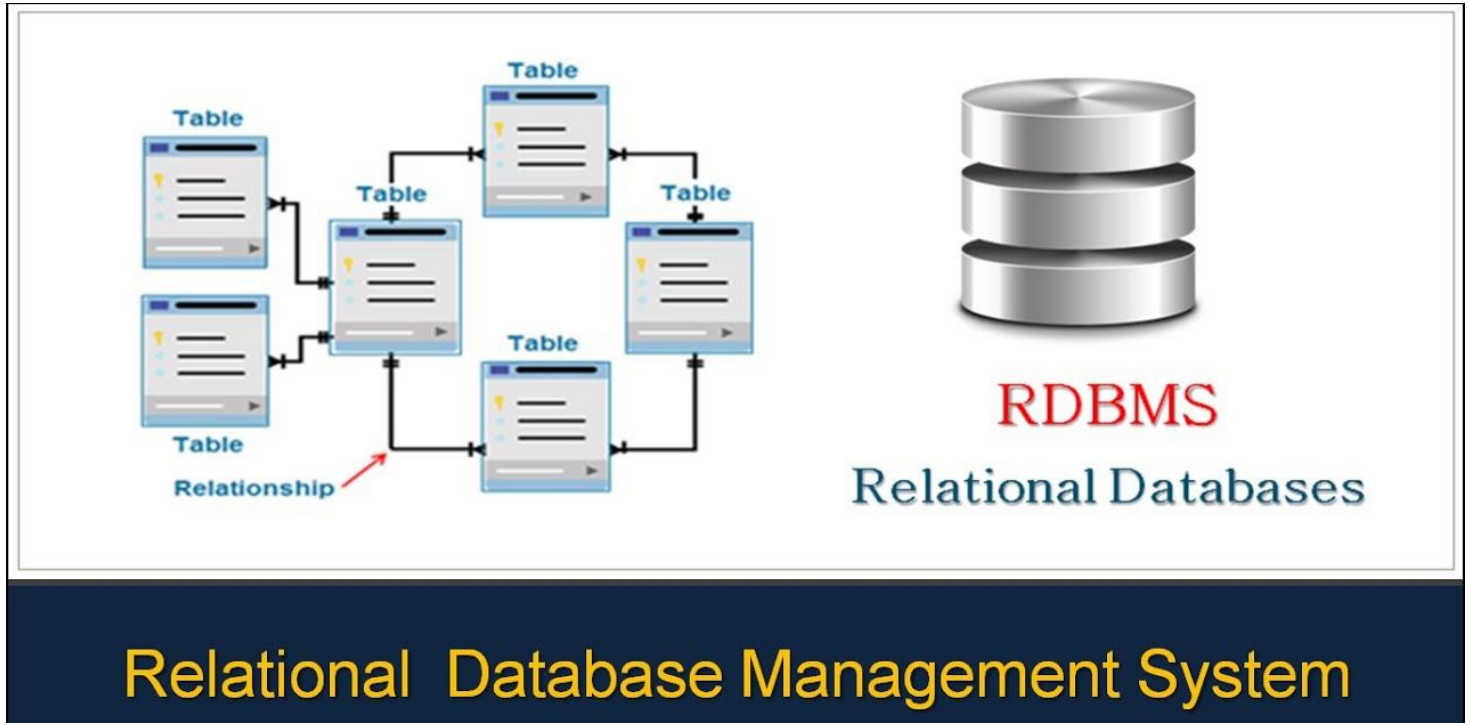
Application Program are the back-end programmers who writes the code for the application programs. They are the computer professionals. These programs could be written in Programming languages such as Visual Basic, Developer, C, FORTRAN.

7. Casual Users / Temporary Users :

Casual Users are the users who occasionally use/access the database but each time when they access the database they require the new information, for example, Middle or higher-level manager.

8. What is a relational database management systems(RDBMS):

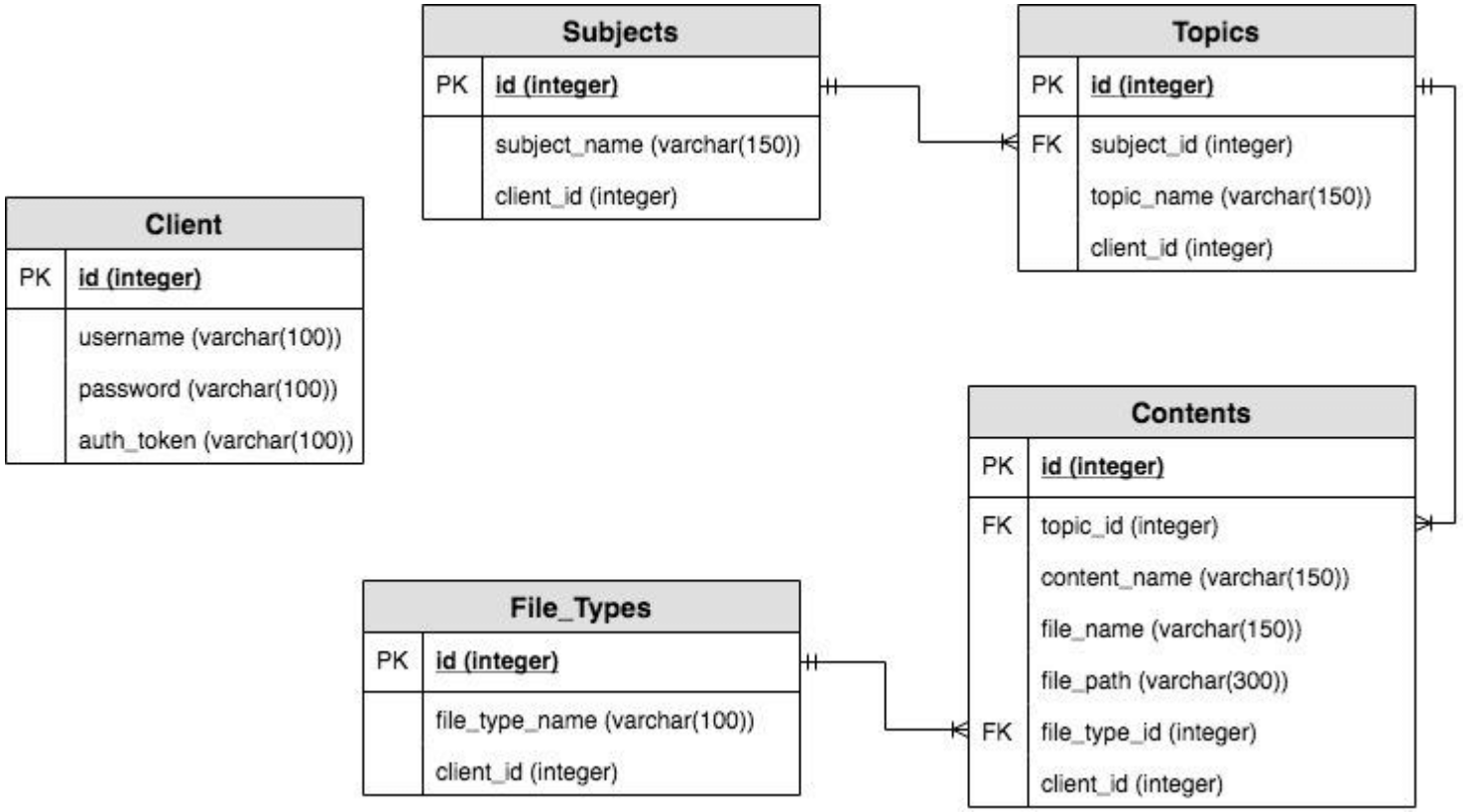
A relational database management system (RDBMS or just RDB) is a common type of database that stores data in tables, so it can be used in relation to other stored datasets.



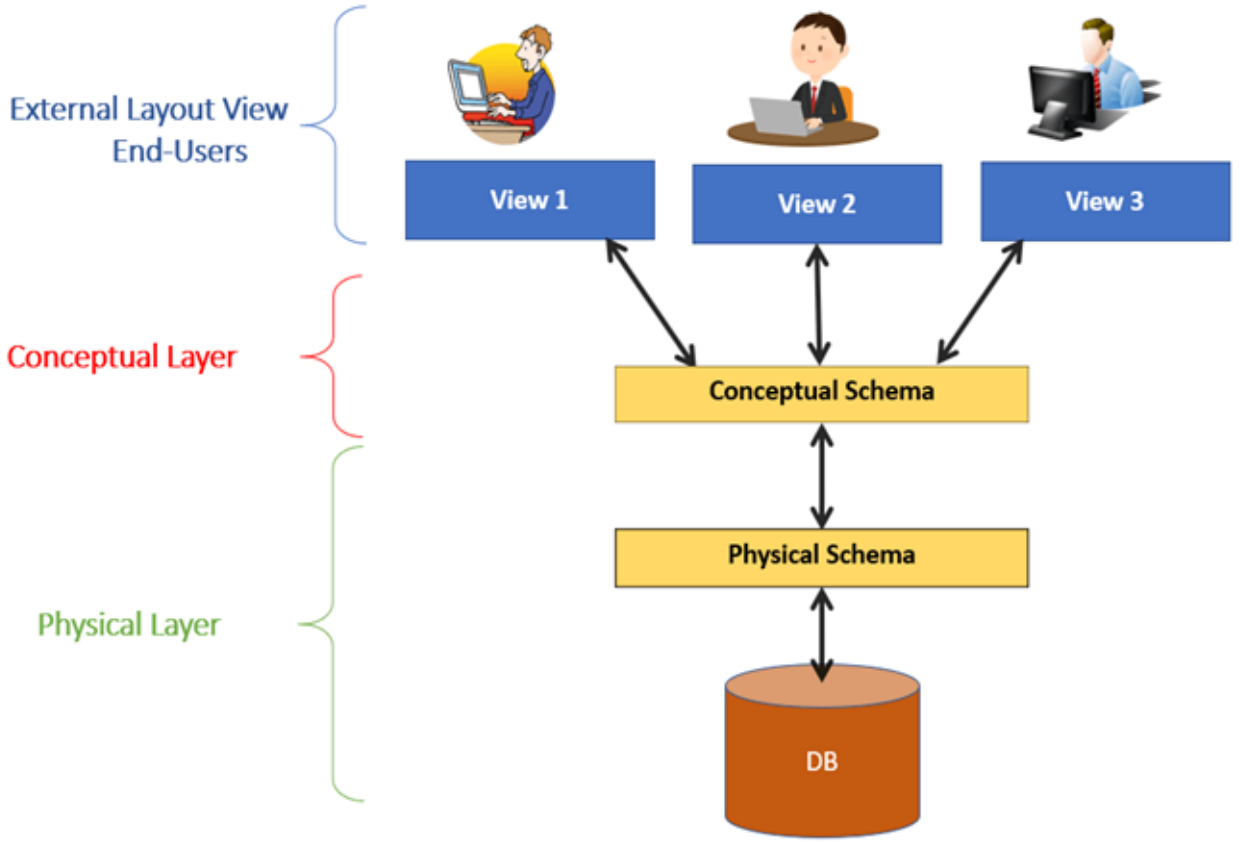
9. What is a Relational database schema:

A database schema is an abstract design that represents the storage of your data in a database.

It describes both the organization of data and the relationships between tables in each database.



10. Architecture of database schema:



10. Architecture of database schema:

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1. Conceptual layer (Logical): A conceptual database schema represents how the data is organized in terms of tables. It also explains how attributes from tables are linked together.

Note: Integrity constraints are a set of rules for a DBMS that maintain quality for data insertion and updates.

To create a conceptual database schema, we use tools to illustrate relationships between components of your data. This is called entity-relationship modeling (ER Modeling). It specifies what the relationships between entity types are.

- **Primary key:** identify a record in the table.
- **Foreign key:** primary key for another table.

2. Physical layer: The physical database schema represents how data is stored on disk storage. In other words, it is the actual code that will be used to create the structure of your database.

Note: Compared to the logical schema, it includes the database table names, column names, and data types.

11. What is query optimizer: