



# **RELATIONAL DATABASE MANAGEMENT SYSTEM (R.D.B.M.S)**

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# What is database? ....

- Database is organized collection of related data stored in particular order that can be used for multiple purpose.
- Let us some real world examples.
  1. Contact app in mobile
  2. School Register (Attendance Sheet)
  3. Library Book Records
  4. Online Shopping (Amazon-like)
  5. Video Game Leaderboard
- There are many different types of database. Relational Database is most popular among them.
- It stores different type of related data in a different table.
- think of it like storing different type of data in a different spreadsheet.
- Let us see example

# RDBMS Example: School Database

- ▶ Few important table in School tables
  - 1. Students
  - 2. Courses
  - 3. fees
- ▶ Students
  - Fields: student\_id name age email mobile
- ▶ Courses
  - Field: course\_id course\_name duration fees
- ▶ fees
  - Field: fees\_id student\_id amount payment\_date mode,

## Why Separate Tables?

1. Avoid data duplication
2. Easy to update (e.g., change one student's email)
3. Easy to add new students or courses
4. Maintain relationships using keys

# More about database

- ▶ Database is basically file created in computer's secondary storage device (HDD/SSD) which has structured data items about person/place/event etc.
- ▶ Database can store many related structured data items (group of values) into different logical unit known as tables.
- ▶ If we consider database about school. One table stores data about students, other table store the data about result, one more store data about fees paid by students, and a table that store data about staff.
- ▶ Each table has horizontal lines known as rows/tuples/records and vertical lines known as columns/fields/attributes.



# What is table?

- a **table** is a set of data elements (values or cell) that is organized in form of vertical **columns** and horizontal **rows**.
- Each table in database has specific structure which has to be given at the time of creating of table.
- A table has a specified number of columns, but can have any number of rows.



# What is row/record/tuple?

- Row means single horizontal line/item in table.
- In the context of a database, a **row** also called a **record** or **tuple** that represents a single structured data item in a table.
- For example, in a table that store student's data , each row represent a single student.
- all rows in the table always has the same structure.
- It means no of columns and types of columns and their names are same.



# What is column/field/attribute?

- A smallest piece of meaningful information in row is called **field** or **column** or **attribute**.
- Each field has specific data type which specify which type of value field can hold for each row.
- All the fields in table has unique name.



# What is primary key?

- When we store so many rows in single table, we need to make sure that each row in table must one unique value
- **Primary key is one field in table** which has **unique value** for each row in a table.
- Primary key help us to differentiate rows in table means we can identify each row uniquely in table.
- Primary key has two main characteristic .
  1. It can't accept null value.
  2. It can't accept duplicate value.
- We should take care below things in case of primary key
  1. We should not manually take input in primary key field from user.
  2. Primary key's value should be generated automatically
  3. Primary key datatype should be integer and it's name should be id.
  4. It should be 1<sup>st</sup> field of table.

# What is database software?

- ▶ A database software is a program used to store, organize, and manage large amounts of data in a structured way. Think of it as a digital filing system where information is kept in tables, much like rows and columns in Excel, but far more powerful.
- ▶ With database software, you can:
  1. **Store data** in an structured format
  2. **Search and retrieve** information quickly
  3. **Add, update, or delete** records safely
  4. **Protect data** through permissions and backup features
  5. **Handle multiple users** working at the same time
  6. Common examples include MySQL, Oracle, SQL Server, and Microsoft Access.

# What is SQL?

- ▶ You use SQL to talk to the database and tell it what you want. For example, you can:
- ▶ Full form of SQL is structure query language.
  - Create tables
  - Insert new data
  - Update existing data
  - Delete data
  - Search and filter information
- ▶ A few common SQL commands are:
  1. SELECT – to read data
  2. INSERT – to add new records
  3. UPDATE – to change records
  4. DELETE – to remove records
  5. CREATE – to make new tables
- ▶ Whenever websites, apps, or software need to store or fetch information—like login details, product lists, or transaction history—SQL is usually the language used behind the scenes to make it happen.
- ▶ MySQL, Oracle, SQL Server, PostgreSQL, and many others rely on SQL. Learning it gives you flexibility across different systems.
- ▶ Companies expect developers, analysts, and IT staff to know SQL. It opens doors in many tech roles.