

## Database

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- A database is a collection of data which is stored and organized, stored electronically in a computer system.

### Why?

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- **Organizing Information:**

Databases helps to keep information organized and easy to find.

If we want to locate a specific record, we can do it quickly.

- **Handling large amount of data**

For businesses and organizations with a lot of information, databases are essential.

- **Ensure data accuracy:**

Databases helps to ensure that the information is correct and up to date

It also reduces mistakes and duplication.

Types of databases:

### 1. Relational Database:

Relational databases store data in tables that are related to each other through common fields. They use SQL (Structured Query Language) to manage and query the data.

Characteristics:

- Data is organized in rows and columns.
- Tables can be linked together using relationships.
- Data integrity and accuracy are maintained through constraints and rules.

Example:

MySQL -> Often used for web applications.

2. NoSQL Database\*

3. In-memory Database\*

4. NewSQL Database\*

SQL (Structured Query Language)

- It's like a language we use to interact with database.
- When we want to get the information or we want to put the information into the database.

DBMS (Database Management System):

### ACID:

1. A - Atomicity

Every transaction should be executed as single unit, means all steps should happen or none should happen.

2. C - Consistency

After every transaction data should be in a correct state.

3. I - Isolation

Any user read data when logs in should read the same data.

4. D - Durability

For longer period of times there should be consistency and correctness in data.

Installation:

Step 1:

[MySQL :: Download MySQL Community Server](#) -> click on the link

<b>Windows (x86, 64-bit), MSI Installer</b>	9.3.0	169.5M
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Step 2:

[MySQL :: MySQL Community Downloads](#) -> click on the link

Download MySQL workbench

Complete Installation Guide Video:

<https://youtu.be/K4LoZzPuQGU?si=zIc-Tb--hl6KEfdy>

SQL Databases:

Categories:

1. String Datatype
2. Numeric
3. Date and Time

#### 1. String Datatype

- Varchar
- Char
- Text
- BLOB
- Binary
- MediumText
- LongText
- Set

#### 2. Numeric

- BIT
- INT
- BIGINT
- FLOAT
- DECIMAL
- DOUBLE
- BOOLEAN

### 3. Date & Time

- Date: YYYY-MM-DD
- DateTime: YYYY-MM-DD hh:mm:ss
- Time: hh:mm:ss

Types of SQL Commands:

DDL (Data Definition Language): create, alter, drop, truncate

DML (Data Manipulation Language): insert, update, delete

DQL (Data Query Language): select

DCL (Data Control Language): grant & revoke

TCL (Transaction Control Protocol): commit, rollback and savepoint