Database

What is Database?

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

Why Databases?

* Organizing information:

Databases helps to keep information organized and easy to find.

If we want to locate a specific record, we can do it very 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 information is correct and up to date, reducing 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(Structure Query Language) to manage and query the data.

Characteristics:

* Data is organized into 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

1. NoSQL database\*
2. In-memory database\*
3. NewSQL database\*

SQL(Structured Query Language)

* It’s like a language we use to talk with database
* When we want to get information and put information into the database we use SQL.

DBMS(DataBase Management System):

ACID:

A – Atomicity:

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

C – Consistency:

After every transaction data should be in a correct state.

I – Isolation:

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

D – Durability:

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

Installation:

Step 1:

[MySQL :: MySQL Downloads](https://www.mysql.com/downloads/) -> click on the link

Step 2:

[MySQL Community (GPL) Downloads »](https://dev.mysql.com/downloads/) click on this

Step 3:

[MySQL Community Server](https://dev.mysql.com/downloads/mysql/) -> Install this

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| --- | --- | --- | --- |
| **Windows (x86, 64-bit), MSI Installer** | 9.2.0 | 118.7M | **Download** |

Step 4:

[MySQL Workbench](https://dev.mysql.com/downloads/workbench/) -> Download workbench

SQL Datatypes:

Categories of datatypes:

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

* Varchar
* Char
* Text
* Binary
* BLOB
* MediumText
* LONGTEXT
* SET
* ENUM

1. Numeric DataType:

* BIT
* INT
* BIGINT
* FLOAT
* DOUBLE
* DECIMAL
* BOOLEAN

1. 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, truncate, drop

DQL(Data Query Language): select

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

DCL(Data Control Language): grant and revoke

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