DATABASE

# History and Story of Data

## What is a Database

It is the collection of data, a method for accessing and manipulating that data.

Database is a system hardware and software that allows the user to store, organize and use data.

## DBMS (Database Management System)

Is a software that is used to manage the database. It receives instruction from the user and instructs the system/database to grab/changes the data.

## RDBMS (Relational Database Management System)

It is the subset of DBMS. E.g.: - MySQL, SQL Server, SQLite etc.

## SQL (Structures Query Language)

It is way to interact with the DBMS.

## Types of Databases

1. Relational
2. Document E.g.: - MongoDB, Firebase etc.
3. Key Value E.g.: - Redis etc.
4. Graph
5. Wider Columnar.

<https://www.ibm.com/cloud/blog/brief-overview-database-landscape>.

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# Database Design

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# Databases + SQL Fundamentals

## Declarative vs Imperative Language

SQL is a Declarative language

**Declarative programming** is a programming paradigm … that expresses the logic of a computation without describing its control flow.

**Imperative programming** is a programming paradigm that uses statements that change a program’s state.

## OLTP vs OLAP

OLTP Online Transaction Processing) :- Supports day to day processing.

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OLAP (Online Analytical processing) :- Supports Analysis.

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## SQL Commands

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## Function

A function is a set of steps that creates a single value.

### Aggregate

Runs against all the data and return one output. (**Operate on many records to produce one value**)

E.g.: - AVG(), COUNT(), MIN(), MAX(), SUM()

### Scalar

Runs against each individual row. (**Operate on each record independently**)

E.g.: - contact()