

## Introduction to Databases

### Concepts in Focus

- Data
- Database
- Database Management System(DBMS)
  - Advantages
- Types of Databases
  - Relational Database
  - Non-Relational Database

### Data



Any sort of information that is stored is called data.

Examples:

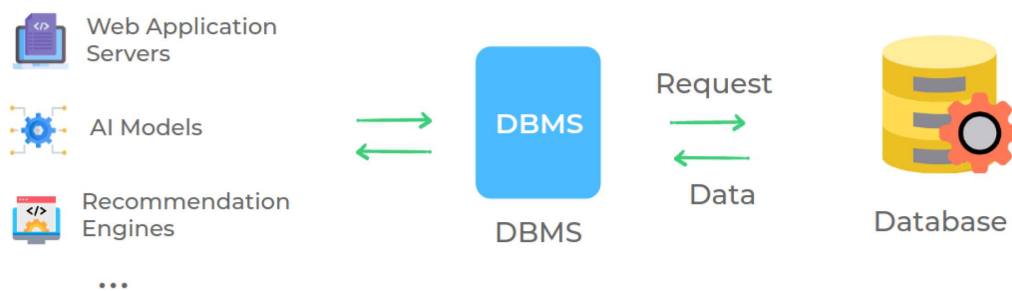
- Messages & multimedia on WhatsApp
- Products and orders on Amazon
- Contact details in telephone directory, etc.

## Database

An organised collection of data is called a database.

## Database Management System (DBMS)

A software that is used to easily store and access data from the database in a secure way.

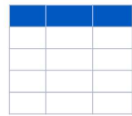


## Advantages

- **Security:** Data is stored & maintained securely.
- **Ease of Use:** Provides simpler ways to create & update data at the rate it is generated and updated respectively.
- **Durability and Availability:** Durable and provides access to all the clients at any point in time.
- **Performance:** Quickly accessible to all the clients(applications and stakeholders).

## Types of Databases

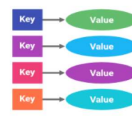
There are different types of databases based on how we organize the data.



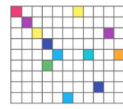
Relational



Analytical



Key Value



Column Family



Graph



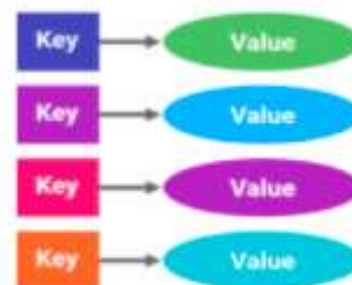
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## Relational Database



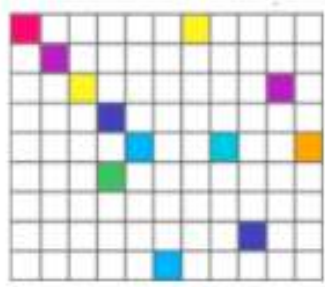
In relational databases, the data is organised in the form of tables.

## Non-Relational Database





Graph



Column Family

Key Value



Document

These four types are commonly referred as non-relational databases.



#### Note

- Choice of database depends on our requirements.
- Relational database is the most commonly used database.

## Relational DBMS

A

**Relational DBMS** is a DBMS designed specifically for relational databases. Relational databases organise the data in the form of tables.

Examples: Oracle, PostgreSQL, MySQL, SQLite, SQL Server, IBM DB2, etc.

## Non-Relational DBMS

A

**Non-relational DBMS** is a DBMS designed specifically for non-relational databases. Non-relational databases store the data in a non-tabular form.

Examples: Elasticsearch, CouchDB, DynamoDB, MongoDB, Cassandra, Redis, etc.