

Database :

A database is an organized collection of structured information, or data, typically stored electronically in a computer system for a specific purpose.

A database is usually controlled by a database management system (DBMS).

Data within the most common types of databases in operation today is typically modelled in rows and columns in a series of tables to make processing and data querying efficient. The data can then be easily accessed, managed, modified, updated, controlled and organized.

Most databases use structured query language (SQL) for writing and querying data.

Benefits of Database :

1) Reducing Data Redundancy :

The file based database management systems contained multiple files that were stored in many different locations in a system or even across multiple systems. Because of this, there were sometimes multiple copies of same file which lead to data redundancy.

This is prevented in a database as there is a single database and any change in it is reflected immediately. Because of this, there is no chance of encountering duplicate data. The data is integrated into a single, logical structure.

2) Data Inconsistency is reduced:

Minimizing data redundancy using database reduces data inconsistency too. Updating of data values become simple and there is no disagreement in stored value.

Eg: Students home addresses are stored at a single location & get updated centrally.

3) Data is shared:

Data sharing means sharing the same data among more than one user. Each user has access to the same data, though they use it for multiple purposes. Authorized users can use data from database. Users can view the data to facilitate its use.

4) Data Independence:

It is the separation of data description (metadata) from the application programs that use data. In the database approach, data descriptions are stored in a central location called data dictionary. This property allows an organization's data to change and evolve (within limits) without changing the application programs that process the data.

5) Data Integrity is maintained:

Stored data is changed frequently for variety of reasons such as adding new data. In the database approach, integrity and consistency of the database are protected using constraints on values that data items can have. Data constraint definitions are maintained in the data dictionary.

6) Data Security is Improved:

The database is a valuable resource that needs protection. The database is kept secure by limiting access to the database by authorized personnel. Authorized users are generally restricted to the particular data they can access, and whether they can update it or not.

7) Backup and Recovery Support:

Backup and recovery are supported by the software that logs changes to the database. This support helps in recovering the current state of the database in case of system failure.

8) Standards are enforced:

Since the data is stored centrally, it is easy to enforce standards on database. Standards could include the naming conventions, and standard for updating, accessing and protecting data. Tools are available for developing and enforcing standards.

9) Application development time is reduced:

The database approach greatly reduces the cost and time for developing new business applications. Programmer can focus on specific functions required for the new applications, without having to worry about design or low level implementation details; as related data have already been designed & implemented.

MySQL:

MySQL is a relational database management system based on SQL- Structured Query Language. This application is used for a wide range of purposes, including data warehousing, e-commerce & logging applications.

The most common use for MySQL is for the purpose of web database. It can be used to store anything from a single record of information to an entire inventory of available products for an online store.

In association with a scripting language such as PHP, it is possible to create websites which will interact in real time with a MySQL database to rapidly display categorised and searchable information to a website user.

MySQL is used by many database-driven web applications, including WordPress, Drupal, etc and is used by many popular websites such as Facebook, Flickr, Twitter, Mediawiki, YouTube, etc.

The SQL commands are mainly categorized into four categories as:

- 1) DDL - Data Definition Language
- 2) DQL - Data Query Language
- 3) DML - Data Manipulation Language
- 4) DCL - Data Control Language

DML and DDL :

DML is Data Manipulation language and is used to manipulate data.

Example: Inserting, updating and deleting statements.

DDL is Data Definition Language and is used to define the structures like schema, database, tables, constraints, etc.

Example: Creating and altering statements.

DDL basically defines the column (Attributes) of the table whereas DML adds or updates the rows of the table, which are called as tuple.