Chapter -08 DBMS CONCEPTS

DATABASE

- A database may be defined as a collection of interrelated data stored together to serve multiple applications.

PURPOSE OF DBMS

- A database system should be a storehouse of the data needed for an organization's dataprocessing.
- Data should be accurate, private, and protected from damage.
- DBMS- ADBMS refers to a software that is responsible for storing, maintaining and utilizing database.
  A database along with a DBMS is referred to as a database system.
- **Data Redundancy**- Duplication of data is known as **Data Redundancy.**

RELATIONAL DATABASE MODEL

- In this, the data is organized into tables (i.e , rows and columns).
- These tables are called relations.
- A row in a table represents a relationship among a set of values.
- Eg oracle database, Microsoft SQL Serve, MYSQL, IBM DB2, IBM Informix, etc
- Eg of DBMS tools for moble- SQL Anywhere, DB2 Everywhere etc.

RELATIONAL MODEL TERMINOLOGY

- **Relation** – A relation is a table i.e data arranged in rows and columns
- **Domain** – A domain is a pool of values from which the actual values appearing in a given column are drawn.

- **Tuple**- The rows of tables (relations) are generally referred to as Tuples.
- **Attributes**- The columns of tables (relations) are generally referred to as attributes.
- **Degree**- The number of attributes in a relation determine the degree of a relation.

- **Cardinality** – The number of tuples(rows) in a relation is called the cardinality of the relation.
- **Views-** A View is a (virtual) table that does not really exist in its own right but is instead derived from one or more underlying base table(s).
- **Primary Key –** Is a set of one or more attributes that can uniquely identify tuples within the relation.
- **Candidate Keys-**All attribute combinations inside a relation that can serve as primary key are Candidate Keys as they are candidates for the primary key position.
- **Alternate Key-** A candidate key that is not the primary key is called an Alternate Key.

- **Foreign Key -** A non-key attribute, whose values are derived from the primary key of some other table, is known as Foreign-Key in its current table.
- **Referential integrity –** Is a system of rules that a DBMS uses to ensure that relationships between records in related tables are valid, and that users don't accidentally delete or change related data.

Brief History of MySQL.

- MySQL was created and is supported by MySQL AB, a company based in Sweden(www.mysql.com).
- This company is now a subsidiary of Sun Microsystems, which holds the copyright to most of the codebase.
- The chief inventor of MySQL was Michael Widenius(a.k.a. Monty)

MySQL Database System

- The Key role of a database management system is information management.
- A database server is the key to solving the problems of information management.
- MySQL operates using **client** /**server** architecture in which the server runs on the machine containing the databases and clients connect to the server over a network.
- **The server**(MySQL server) listens for client requests coming in over the network and accesses database contents according to those requests and provides that to the clients.
- **Clients** are programs that connect to the database server and issue queries in a pre-specified format.
- **Key features are** speed, Ease of use, Cost, Query Language Support, MySQL, Portability, Data Types, Security, Scalability and Limits, Connectivity, Localization, Clients and Tools.

MySQL and SQL

- In order to access data within the MySQL database, all programs and users must use, SQL.
- SQL is the set of commands that is recognised by nearly all RDBMSs.
- Usage of SQL has become a standard for most of RDBMSs.
- There are numerous version of SQL. The original version was developed at IBM's San Jose Research Laboratory(now the Almandan Research Centre).
- This language, originally called Sequel.

Processing Capabilities of SQL

- Data Definition Language(DDL)
- Interactive Data Manipulation Language(DML)
- Embedded Data Manipulation Language
- View Definition
- Authorization
- Integrity

- Transaction Control

Classification of SQL Statements

- SQL, technically speaking, is a data sublanguage. That is, it is a language used to interact with databse.
- In other words, all SQL statements are instructions to the database only.

SQL commands can be divided into following categories

- Data Definition Language(DDL) Commands
- Data Manipulation Language(DML) Commands
- Transaction Control Language (TCL) Commands eg **COMMIT, ROLLBACK, SAVEPOINT, SET TRANSACTION**
- Session Control Commands
- System Control Commands