DBMS REPORT

* What is Database ?

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

* What is DBMS ?

A Database Management System (DBMS) is a software system that is designed to manage and organize data in a structured manner. It allows users to create, modify, and query a database, as well as manage the security and access controls for that database. DBMS provides an environment to store and retrieve data in convenient and efficient manner.

* What is RDBMS ?

Data is organized into tables (relations) with rows and columns, and the relationships between the data are managed through primary and foreign keys. SQL (Structured Query Language) is used to query and manipulate the data.

* What are different type if database languages ?

**Data Definition Language (DDL)**

DDL is the short name for Data Definition Language, which deals with database schemas and descriptions, of how the data should reside in the database.

**CREATE**: to create a database and its objects like (table, index, views, store procedure, function, and triggers)

**ALTER**: alters the structure of the existing database

**DROP**: delete objects from the database

**TRUNCATE**: remove all records from a table, including all spaces allocated for the records are removed

**COMMENT**: add comments to the data dictionary

**RENAME**: rename an object

**Data Manipulation Language (DML)**

DML is the short name for Data Manipulation Language which deals with data manipulation and includes most common SQL statements such SELECT, INSERT, UPDATE, DELETE, etc., and it is used to store, modify, retrieve, delete and update data in a database.

**SELECT**: retrieve data from a database

**INSERT**: insert data into a table

**UPDATE**: updates existing data within a table

**DELETE**: Delete all records from a database table

**Data Control Language (DCL)**

DCL is short for Data Control Language which acts as an access specifier to the database.(basically to grant and revoke permissions to users in the database

**GRANT**: grant permissions to the user for running DML(SELECT, INSERT, DELETE,…) commands on the table

**REVOKE**: revoke permissions to the user for running DML(SELECT, INSERT, DELETE,…) command on the specified table

**Transactional Control Language (TCL)**

TCL is short for Transactional Control Language which acts as an manager for all types of transactional data and all transactions. Some of the command of TCL are

**Roll Back**: Used to cancel or Undo changes made in the database

**Commit**: It is used to apply or save changes in the database

* What are advantages of DBMS ?
* Data organization
* Data integrity
* Concurrent access
* Data security
* Backup and recovery
* Data sharing
* What is normalization in DBMS ?

In database management systems (DBMS), normal forms are a series of guidelines that help to ensure that the design of a database is efficient, organized, and free from data anomalies. There are several levels of normalization, each with its own set of guidelines, known as normal forms.

**First Normal Form (1NF):**

This is the most basic level of normalization. In 1NF, each table cell should contain only a single value, and each column should have a unique name. The first normal form helps to eliminate duplicate data and simplify queries.

**Second Normal Form (2NF):**

2NF eliminates redundant data by requiring that each non-key attribute be dependent on the primary key. This means that each column should be directly related to the primary key, and not to other columns.

**Third Normal Form (3NF):**

3NF builds on 2NF by requiring that all non-key attributes are independent of each other. This means that each column should be directly related to the primary key, and not to any other columns in the same table.

* What is a primary key and foreign key in an table ?

**Primary key :**

A primary key is used to ensure that data in the specific column is unique. A column cannot have NULL values. It is either an existing table column or a column that is specifically generated by the database according to a defined sequence.

**Foreign Key :**

A foreign key is a column or group of columns in a relational database table that provides a link between data in two tables. It is a column (or columns) that references a column (most often the primary key) of another table.

Database Architecture Create :-

* Create Database :

CREATE DATABASE workshop;

* Use Database :

USE workshop;

* Create Tables :

**Create Table Address:**

CREATE TABLE address(

pincode VARCHAR(25) PRIMARY KEY

, city VARCHAR(25)

, state VARCHAR(25) );

**Create Table users :**

CREATE TABLE users (

user\_id VARCHAR(25) PRIMARY KEY,

first\_name VARCHAR(25),

last\_name VARCHAR(25),

pincode VARCHAR(25),

FOREIGN KEY (pincode) REFERENCES address(pincode));

**Create Table Products :**

CREATE TABLE products (

product\_id VARCHAR(25) PRIMARY KEY,

product\_name VARCHAR(25),

product\_description TEXT,

product\_returnable VARCHAR(25),

owner VARCHAR(100)

);

**Create table orders :**

CREATE TABLE orders (

order\_id VARCHAR(25) PRIMARY KEY,

product\_id VARCHAR(25),

user\_id VARCHAR(25),

total DOUBLE,

date DATE,

status VARCHAR(25),

FOREIGN KEY (product\_id) REFERENCES products(product\_id),

FOREIGN KEY (user\_id) REFERENCES users(user\_id));

