**SQL Assignment 1**

1. What is a relational database management system (RDBMS)? What are the advantages of a database management system over a file system?

A database management system (DBMS) that incorporates the relational-data model is RDBMS. RDBMS allows users to construct, update, manage, and interact with a relational database, allowing storing data in a tabular form. Therefore, consider RDBMS as an advanced data management system that makes gaining insights from data a lot easier.

The pros of a relational database management system offer a systematic view of data, which helps businesses improve their decision-making processes by enhancing different areas.

1. In a database management system, explain the ACID properties.

**ACID Properties** are used for maintaining the integrity of database during transaction processing. ACID in DBMS stands for **A**tomicity, **C**onsistency, **I**solation, and **D**urability.

* **Atomicity:** A transaction is a single unit of operation. You either execute it entirely or do not execute it at all. There cannot be partial execution.
* **Consistency:** Once the transaction is executed, it should move from one consistent state to another.
* **Isolation:**Transaction should be executed in isolation from other transactions (no Locks). During concurrent transaction execution, intermediate transaction results from simultaneously executed transactions should not be made available to each other. (Level 0,1,2,3)
* **Durability:** **·**After successful completion of a transaction, the changes in the database should persist. Even in the case of system failures.

1. Explain the concept of normalization.

Normalization is the process of reorganizing data in a database so that it meets two basic requirements:

1. There is no redundancy of data, all data is stored in only one place.
2. Data dependencies are logical,all related data items are stored together.

There are six Normal forms which are as follows −

* First Normal Form (1NF)
* Second Normal Form (2NF)
* Third Normal Form (3NF)
* Boyce-Codd Normal Form (BCNF)
* Fourth Normal Form (4NF)
* Fifth Normal Form (5NF)

1. Explain the many types of query languages used in relational databases. DQL, DML, DCL, and DDL are some examples.

These are basically four types.

1. Data definition Language:-

DDL statements create and modify database objects such as tables, indexes, and users. Common DDL statements are CREATE, ALTER, and DROP.

You can query your db by creating Or Modifying your db objects.

2.Data Manipulation Language

**data manipulation language** (**DML**) is a computer programming **language** used for adding (inserting), deleting, and modifying (updating) **data** in a **database**. A popular **data manipulation language** is that of Structured Query **Language** (SQL), which is used to retrieve and **manipulate data** in a relational **database**.

So for querying your db you can use insert, update and delete for the data. This can be used in manipulation of the data in the db.

3. Data control Language

DCL includes commands such as GRANT and REVOKE which mainly deals with the rights, permissions and other controls of the database system.

**Examples of DCL commands:**

* **GRANT**-gives user’s access privileges to database.
* **REVOKE**-withdraw user’s access privileges given by using the GRANT command.

4. **TCL(transaction Control Language) :**TCL commands deals with transactions within the database . **Examples of TCL commands:**

* **COMMIT**– commits a Transaction.
* **Rollbacks-** a transaction in case of any error occurs.
* **SAVEPOINT**–sets a savepoint within a transaction.
* **SET TRANSACTION**–specify characteristics for the transaction.

1. What is the difference between the main key and a composite key? Give instances of how primary key and composite are used.

While a primary key and a composite key might do the same things, the primary key will consist of one column, where the composite key will consist of two or more columns.  
A Primary keys column must contain unique values and cannot have null values. A table can have only one primary key, which may consist of single or multiple columns . A **COMPOSITE KEY** is a combination of two or more columns in a table that can be used to uniquely identify each row in the table when the columns are combined uniqueness is guaranteed, but when it taken individually it does not guarantee uniqueness.

1. Create a table with a primary key, a column default value, and a column unique constraint in SQL.

CREATE DATABASE CLASS\_V

USE CLASS\_V

CREATE TABLE STUDENTS

(  
studentID int not null,

Rollnumber int unique,

student\_name varchar(50),

student\_DOB datetime,

gender varchar(1),

class\_section varchar(10) default ‘B’

PRIMARY KEY (studentID)

)