**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?

An RDBMS is a type of database management system (DBMS) that stores data in a row-based table structure which connects related data elements. An RDBMS includes functions that maintain the security, accuracy, integrity and consistency of the data.

The advantages of a DBMS over a file system are as follows:

* No redundant data
* Data consistency and integrity
* Data security
* Privacy
* Easy access to data
* Easy recovery
* Flexible

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

The ACID properties are as follows:

**Atomicity** – The entire transaction takes place at once or doesn’t happen at all.

**Consistency** – The database must be consistent before and after the transaction.

**Isolation** – Multiple transactions occur independently without interference.

**Durability** – The changes of a successful transaction occurs even if the system failures occurs.

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1. Explain the concept of normalization.

Normalization is the process of organizing data in a database. This includes creating tables and establishing relationships between those tables according to rules designed both to protect the data and to make the database more flexible by eliminating redundancy and inconsistent dependency.

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

**DQL (Data Query Language)** - DQLstatements are used for performing queries on the data within schema objects. The purpose of the DQL Command is to get some schema relation based on the query passed to it.

**SELECT**

**DML (Data Manipulation Language)** - The SQL commands that deals with the manipulation of data present in the database belong to DML. It is the component of the SQL statement that controls access to data and to the database.

**INSERT**

**UPDATE**

**DELETE**

**DCL (Data Query Language) -** DCL includes commands which mainly deal with the rights, permissions, and other controls of the database system.

**GRANT**

**REVOKE**

**DDL (Data Definition Language)** - DDL actually consists of the SQL commands that can be used to define the database schema. It simply deals with descriptions of the database schema and is used to create and modify the structure of database objects in the database.

**CREATE**

**DROP**

**ALTER**

**TRUNCATE**

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

First, a primary key uniquely identifies each record in a database table. Any individual key that does this can be called a candidate key, but only one can be chosen by database engineers as a primary key.

Next, there's the composite key, which is composed of two or more attributes that collectively uniquely identify each record.

Ex - Imagine we identified a student by their *firstName* + *lastName*. In a table representing students our primary key would now be *firstName* + *lastName*. Because students can have the same firstNames or the same lastNames these attributes are not simple keys. The primary key *firstName* + *lastName* for students is a composite key.

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

CREATE TABLE Sales

(

cus\_id int not null,

cus\_name varchar (50),

cus\_email varchar (100) not null,

total\_orders int,

price int default 0,

PRIMARY KEY (cus\_id),

UNIQUE (cus\_email)

)

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