**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?

Ans:

A relational database management system is a common type of database that stores data in tables, so it can be used in relation to other stored datasets. Most databases used by businesses these days are relational databases, as opposed to a flat file.

Advantages:

* **No redundant data**: Redundancy removed by Normalization
* **Data Consistency and Integrity**:data inconsistency is data redundancy, since data normalization takes care of the data redundancy, data inconsistency also been taken care of by removing redundancy
* **Data Security**: It is easier to apply access constraints in database systems so that only authorized user is able to access the data.
* **Privacy**: Limited access means privacy of data.
* **Easy access to data** – Database systems manages data in such a way so that the data is easily accessible with fast response times.
* **Easy recovery**: Since database systems keeps the backup of data, it is easier to do a full recovery of data in case of a failure.
* **Flexible**: more flexible than flat files.

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

**Atomicity**

All changes to data are performed as if they are a single operation. That is, all the changes are performed, or none of them are.

For example, in an application that transfers funds from one account to another, the atomicity property ensures that, if a debit is made successfully from one account, the corresponding credit is made to the other account.

**Consistency**

Data is in a consistent state when a transaction starts and when it ends.

For example, in an application that transfers funds from one account to another, the consistency property ensures that the total value of funds in both the accounts is the same at the start and end of each transaction.

**Isolation**

The intermediate state of a transaction is invisible to other transactions. As a result, transactions that run concurrently appear to be serialized.

For example, in an application that transfers funds from one account to another, the isolation property ensures that another transaction sees the transferred funds in one account or the other, but not in both, nor in neither.

**Durability**

After a transaction successfully completes, changes to data persist and are not undone, even in the event of a system failure.

For example, in an application that transfers funds from one account to another, the durability property ensures that the changes made to each account will not be reversed.

1. Explain the concept of normalization.
2. Explain the many types of query languages used in relational databases. DQL, DML, DCL, and DDL are some examples.
3. What is the difference between the main key and a composite key? Give instances of how primary key and composite are used.
4. Create a table with a primary key, a column default value, and a column unique constraint in SQL.