DataBase Management System Notes

# SQL –

Structured Query Language. It is a standard language for dealing with relational database. It is very important for us to understand how to use queries to retrieve the required data. It is used to interact with database, i.e create a database, update a query, to create a table, to retrieve he data.

It is a data-oriented.

**For Example** : we can execute queries, we can insert records into a table, we can update records,

we can create a database, we can create a table, we can delete a table, etc.

# DataBase –

It is defined as a structured form of data storage in a computer or a collection of data in an organized manner. It is also collections of different schemas, tables, queries, views etc. It helps us to store the data, accessing and manipulating data held on a computer. It allows user to interact with the database.

# Data Definition Language –

It allows to execution of queries like CREATE, DROP and ALTER. That is those queries that define the data.

# Join in SQL –

An SQL Join statement is used to combine data or rows from two or more tables based on a common field between them. Different types of Joins are:

* **INNER JOIN -** The INNER JOIN keyword selects all rows from both the tables as long as the condition satisfies. This keyword will create the result-set by combining all rows from both the tables where the condition satisfies i.e the value of the common field will be the same.
* **LEFT JOIN** - This join returns all the rows of the table on the left side of the join and matching rows for the table on the right side of the join. For the rows for which there is no matching row on the right side, the result-set will be null. LEFT JOIN is also known as LEFT OUTER JOIN.
* **RIGHT JOIN -** RIGHT JOIN is similar to LEFT JOIN. This join returns all the rows of the table on the right side of the join and matching rows for the table on the left side of the join. For the rows for which there is no matching row on the left side, the result-set will contain null. RIGHT JOIN is also known as RIGHT OUTER JOIN.
* **FULL JOIN -** FULL JOIN creates the result-set by combining results of both LEFT JOIN and RIGHT JOIN. The result-set will contain all the rows from both tables. For the rows for which there is no matching, the result-set will contain NULL values.

# ****Index –****

A database index is a data structure that improves the speed of data retrieval operations on a database table at the cost of additional writes and the use of more storage space to maintain the extra copy of data. Data can be stored only in one order on a disk. To support faster access according to different values, a faster search like binary search for different values is desired. For this purpose, indexes are created on tables. These indexes need extra space on the disk, but they allow faster search according to different frequently searched values.

# ****Table –****

A table has a combination of rows and columns. Rows are called records and columns are called fields. In MS SQL Server, the tables are being designated within the database and schema names.

# ****Field –****

In DBMS, a database field can be defined as – a single piece of information from a record.

# ****Normalization –****

It is a process of analyzing the given relation schemas based on their functional dependencies and primary keys.

1. Minimizing Redundancy.
2. Minimizing the Insertion, Deletion, And Update Anomalies .

# ****DeNormalization –****

Denormalization is a database optimization technique in which we add redundant data to one or more tables. This can help us avoid costly joins in a relational database. Denormalization does not mean not doing normalization. It is an optimization technique that is applied after doing normalization.

In a traditional normalized database, we store data in separate logical tables and attempt to minimize redundant data. We may strive to have only one copy of each piece of data in the database.

# ****The different attributes of indexes –****

* **Access Types :** This refers to the type of access such as value-based search, range access, etc.
* **Access Time :** It refers to the time needed to find a particular data element or set of elements.
* **Insertion Time :** It refers to the time taken to find the appropriate space and insert new data.
* **Deletion Time :** Time is taken to find an item and delete it as well as update the index structure.
* **Space Overhead -** It refers to the additional space required by the index.

# ****Cursor –****

The cursor is a Temporary Memory or Temporary Work Station. It is Allocated by Database Server at the Time of Performing DML operations on Table by User. Cursors are used to store Database Tables.

# ****Types Of****Relationships****In SQL –****

* One-to-One Relationship.
* One to Many Relationships.
* Many to One Relationship.
* Self-Referencing Relationship

# ****Query –****

ASQL query is used to retrieve the required data from the database. However, there may be multiple SQL queries that yield the same results but with different levels of efficiency. An inefficient query can drain the database resources, reduce the database speed or result in a loss of service for other users. So it is very important to optimize the query to obtain the best database performance.

# ****Subquery –****

In SQL a Subquery can be simply defined as a query within another query. In other words, we can say that a Subquery is a query that is embedded in the WHERE clause of another SQL query.

# ****Different operators available in SQL –****

* Arithmetic Operator
* Logical Operator
* Comparison Operator

# ****Trigger –****

A system executes automatically when there is any modification to the database. In a trigger, we first specify when the trigger is to be executed and then the action to be performed when the trigger executes. Triggers are used to specify certain integrity constraints and referential constraints that cannot be specified using the constraint mechanism of SQL.

# ****Difference between DELETE and TRUNCATE commands –****

Delete Commands –

* It removes rows one at a time and records an entry in the transaction log for each deleted row.
* DELETE command is slower than TRUNCATE command.
* To use Delete you need DELETE permission on the table.
* Identity of column retains the identity after using DELETE Statement on table.
* The delete can be used with indexed views.

Truncate Commands –

* TRUNCATE TABLE removes the data by deallocating the data pages used to store the table data and records only the page deallocations in the transaction log.
* The TRUNCATE command is faster than the DELETE command.
* To use Truncate on a table we need at least ALTER permission on the table.
* Identity of the column is reset to its seed value if the table contains an identity column.
* Truncate cannot be used with indexed views.