

Assignment 1

Q1: What are the various constraints in SQL? Explain any five.

Ans: The following constraints are commonly used in SQL:

- Not null- Ensures that a column cannot have a NULL value
- Unique- Ensures that all values in a column are different
- Primary key - A combination of a NOT NULL and UNIQUE. Uniquely identifies each row in a table
- Foreign key - Uniquely identifies a row/record in another table
- Check - Ensures that all values in a column satisfies a specific condition
- Default - Sets a default value for a column when no value is specified
- Index - Used to create and retrieve data from the database very quickly

Q2: What is Pattern matching in SQL and how it is done?

Ans: SQL has a standard pattern matching technique using the like, operator. But, it also supports the regular expression pattern matching for better functionality. Generally, the **RegexpLike, 'column name regex'** function is used for pattern matching in SQL. SQL also supports some operators that work similar to this function, these are: **'REGEXP' and 'RLIKE' operator.**

Q3: What is a checkpoint and when does it occur?

Ans: Checkpoint is a process that writes current in-memory dirty pages (modified pages) and transaction log records to physical disk. In SQL Server checkpoints are used to reduce the time required for recovery in the event of system failure. Checkpoint is regularly issued for each database. The following set of operations starts when checkpoint occurs:

1. Log records from log buffer (including the last log record) are written to the disk.
2. All dirty data file pages (pages that have been modified since the last checkpoint or since they were read from disk) are written into the data file from the buffer cache.
3. Checkpoint LSN is recorded in the database boot page.

The **server-level** recovery interval option specifies the maximum amount of time required by the **SQL Server** Database Engine to recover the database after restarting the **SQL Server**. The default recovery interval value is 0, which issues an automatic **checkpoint** every 60 seconds.

Q4: What is E-R model?

Ans: The ER or (Entity Relational Model) is a high-level conceptual data model diagram. Entity-Relation model is based on the notion of real-world entities and the relationship between them. ER modeling helps you to analyze data requirements systematically to produce a well-designed database. So, it is considered a best practice to complete ER modeling before implementing your database.

Q5: What is denormalization in DBMS?

Ans: **Denormalization** is an approach to speeding up read-oriented data retrieval performance in a relational **database**, where the **database** administrator selectively adds back specific instances of redundant data after the data structure has been normalized.

Q6: What is normalization in DBMS?

Ans: **Normalization** is the process of minimizing redundancy from a relation or set of relations. Redundancy in relation may cause insertion, deletion and updation anomalies. So, it helps to minimize the redundancy in relations. Normal forms are used to eliminate or reduce redundancy in database tables.