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Taking People To The Next Level

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Programming Fundamentals

Programming Fundamentals

- Topics to be covered in this session

  - SQL – An introduction
  - DDL queries
  - DML queries

Introduction to SQL

- SQL stands for (Structured Query Language)
- It is a query language used for accessing and modifying information in a database
- A database is a collection of related data
- SQL works by querying the database in a variety of ways
- In SQL, the data are stored in tables
- Hence a database in SQL is viewed as a collection of related tables

SQL Contd..

- In the below figure, a typical structure of a table is shown
- Here a table is uniquely identified by the name ‘weather’
- A table consists of a set of columns and rows
- Each column is known as a field. Here city, state, high and low are the fields of the table
- The rows contain the records or data for the columns

CITY	STATE	LOW	HIGH
CHENNAI	TAMIL NADU	92	105
COCHI	KERALA	89	106
KOLKATA	WEST BENGAL	78	104

SQL Contd..

- SQL is a non-procedural language, it processes data in groups of records rather than one record at a time

- Few functions of SQL are:
  - Storing the data within the database
  - Modifying the stored data
  - Retrieving the existing data
  - Deleting from the database
  - Creating tables and other database objects
  - In order to perform the above mentioned functions certain command statements are required

SQL Contd..

SQL consists of two main types of command statements. They include:

- Data Definition Language (DDL) statements
- Data Manipulation Language (DML) statements

Data Definition Language (DDL)

- DDL statements are those commands that are used to define the database structure or schema

- These statements are free to be mixed with other SQL statements and hence do not appear as a separate language

Data Definition Language (DDL) Contd..

The following are the tasks that may be performed with DDL:

- Creating, altering and dropping schema objects
- Granting and revoking privileges and roles
- Analysing information on a table, index or cluster
- Establishing auditing options and adding commnts

Data Definition Language (DDL) Contd..

Some examples of the DDL commands include the following:

- **CREATE:** This creates an object or an attribute in the database
- A table can be created with the help of this syntax,

  CREATE TABLE <table name>

  (<attribute name 1> <data type 1>, ...

  <attribute name n> <data type n>);
- **ALTER:** This alters the structure of the database

  ALTER TABLE <table name>

Data Definition Language (DDL) Contd..

- DELETE: This statement is used to delete rows from a table
- DELETE FROM table_name [WHERE condition];
- RENAME: This command allows to rename a table
- RENAME TABLE {tbl_name} TO {new_tbl_name};
- COMMENT: Comments can be added to the tables with this command

Data Definition Language (DDL) Contd..

- DROP: The objects are deleted from the database or a table itself may be deleted
- DROP TABLE <table name>;
- ALTER TABLE <table name>
- DROP CONSTRAINT <constraint name>;
- TRUNCATE: The records from a table are removed to simply free the space contained by it
- TRUNCATE TABLE name;
- The DROP command terminates all the relationship of the dropped table whereas a truncate does not modify the table structure

Data Manipulation Language

- Data Manipulation Language (DML) statements are used for managing data within the table
- They access and manipulate data within existing tables
- Some examples for DML include the following
- SELECT: This command queries or retrieves data from specified columns or from all of the columns in the table
- SELECT column list FROM table-name

  Table-name is the name of the table from which the information is retrieved. **Column list** includes one or more columns from which data is retrieved

Data Manipulation Language Contd..

- INSERT: An insert statement is used to insert new rows of data to an existing table
- The insertion operation can be performed in two different ways they include:

Data Manipulation Language Contd..

By inserting into the table directly

- INSERT INTO TABLE_NAME

  [(col1, col2, col3,...colN)]

  VALUES (value1, value2, value3,...valueN);
- Here the name of the columns along with the values to be inserted into the columns are mentioned
- If the values are to be stored in a row then the columns need not be mentioned

Data Manipulation Language Contd..

By inserting with the aid of SELECT command

- INSERT INTO table name

  [(column1, column2, ... columnN)]

  SELECT column1, column2, ...columnN

  FROM table name [WHERE condition];

Here the columns are initially selected and then inserted into relative table name mentioned

Data Manipulation Language Contd..

- UPDATE: This command is used to modify the existing rows in a table

```
UPDATE table name
SET column_name1 = value1,
column_name2 = value2, ...
[WHERE condition]
```

Data Manipulation Language Contd..

- ROLLBACK: This command is used when the changes made recently have to be undone and the original has to be retained
- COMMIT: This command is used when the changes made are to be set visible to other users

These commands are generally used only in case of multiuser systems


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