Introduction to SQL

CO226 : Database Systems

Lab - 4

Anjalee Wanigarathne
anj.wanigarathne@gmail.com

Outline

- Types of SQL Statements
- ANSI/ISO SQL Keywords
- SQL Data Types
- Creating a Database
- Using the Database
- Creating a Table
- Displaying the Structure of a Table
- Displaying Databases and Tables
- Removing an Existing Table
- Removing an Existing Database

What is SQL?

- Stands for Structured Query Language
- A relational database language used for controlling and interacting with database management systems
- Not a type of DBMS

Types of SQL Statements

- **Data Definition Language (DDL)**

  – These statements are used to create new objects, alter the structure of existing objects, or to remove the objects from the system

  – These statements cannot be used to modify data

CREATE TABLE	Creates a new table
DROP TABLE	Removes an existing table
ALTER TABLE	Modifies the structure of a table
CREATE VIEW	Creates a new view
DROP VIEW	Removes an existing view
CREATE INDEX	Build an index for a column
DROP INDEX	Removes an index
TRUNCATE	Removes all table records

Types of SQL Statements (cont.)

- **Data Manipulation Language (DML)**

  – These statements change the data in the database

INSERT	Adds new rows of data
DELETE	Removes row of data
UPDATE	Modifies existing data
SELECT	Retrieve data

(Note: The SELECT statement is a limited form of DML statements in that it can only access data in the database. It cannot manipulate data in the database, although it can operate on the accessed data before returning the results of the query.)

Types of SQL Statements (cont.)

- **Data Control Language (DCL)**

  – These statements control the access of the data in the database & determines how, when & whom can manipulate data

GRANT	Gives user access privileges
REVOKE	Removes granted privileges

ANSI/ISO SQL Keywords

- ANSI/ISO specifies standard SQL keywords which cannot be used to name databases objects like tables, columns and users.

ANSI/ISO SQL Keywords (cont.)

ALL	COUNT	FOUND	MAX	PRIVILEGES
AND	CREATE	FROM	MIN	REFERENCE
AVG	DEFAULT	GO	NOT	ROLLBACK
BEGIN	DELETE	GRANT	NULL	SELECT
BETWEEN	DISTINCT	GROUP	NUMERIC	SET
BY	END	HAVING	OF	SQL
C	EXEC	IN	OR	TABLE
CHAR	FETCH	INSERT	ORDER	VIEW
CHARACTER		FLOAT	INT	FOREIGN
INTEGER	PRECISION	COMMIT	FORTRAN	KEY
PRIMARY				

Note: Keywords used may varies with the different implementations of SQL

SQL Data Types

- The basic data types available for attributes include numeric, character string, boolean, date and time
- Those data types may vary from different implementations of SQL –

Numeric

- Include integer numbers of various sizes (INTEGER or INT) and real numbers of various precision (FLOAT or REAL or DOUBLE).
- Formatted numbers can be declared by using DECIMAL(i,j) or NUMERIC(i,j) where i is the precision and j the scale is the number of digits after the decimal point.

SQL Data Types (cont.)

Character-string

- Data types are either fixed length – CHAR(n) or CHARACTER(n) where n is the number of characters or varying length VARCHAR(n) where n is the maximum number of characters.

Boolean

- Boolean data type has the values of TRUE or FALSE

Date and time

- The DATE data type has ten positions and its components are YEAR, MONTH and DAY in the form of YYYY-MM-DD. The time data type has at least eight positions with the components HOUR, MINUTE and SECOND in the form of HH:MM:SS

Managing a Database with MySQL

How to start MySQL in Linux ?

Command:

$ mysql –u<username> -p<password>

Example: $ mysql –uroot –proot

- If you are logging in on a different machine, specify the host as well. $ mysql –h<host> –u<username> -p<password>

Displaying Databases

- **To display the existing databases**

SHOW DATABASES;

– This command lists all the databases on the MySQL server host

Creating a Database

- Syntax

  CREATE DATABASE <DatabaseName>;

- Example:

  CREATE DATABASE School;

Using the Database

- Syntax

  USE<DatabaseName> ;

  - Example:

    USE School;

Creating a Table

- **Syntax**

  CREATE TABLE <TableName>

  (<Field1><DataType>(<FieldSize>),

  <Field2><DataType>(<FieldSize>),

  <Field3><DataType>(<FieldSize>));

Creating a Table (cont.)

- **Example:**

```
CREATE TABLE Student
        (IndexNo CHAR(4),
        StudentName VARCHAR(30),
        Age INT,
        Gender CHAR(1));
```

Displaying Tables

To display the existing tables in a database

```
SHOW TABLES;
```

- This command lists all the tables in a given database

Note: You have to use (go inside) the database before typing this command

Displaying the Structure of a Table

This command displays the information about the columns in a table (the table structure).

- Syntax

  DESCRIBE<TableName> ;

  OR

  DESC<TableName> ;

- Example:

  DESCRIBE Student;

Removing an Existing Table

- Syntax

  DROP TABLE<TableName> ;

- Example:

  DROP TABLE Student;

Removing an Existing Database

- Syntax

  DROP DATABASE<DatabaseName> ;

- Example:

  DROP DATABASE School;

Some Tips for Practical Classes

- To cancel the currently typing command

  mysql> \c

- To clear the terminal

  – Press **Ctrl+L** on the keyboard

- To get previously executed commands

  – Press Up and Down arrow keys on the keyboard

Some Tips for Practical Classes (cont.)

- Copy from the terminal and paste to the terminal

  – Right click the mouse -> Copy or Paste

- To exit from MySQL prompt

  mysql> exit

  OR

  mysql> QUIT

  OR

  mysql> \q

Activity