

# **University of Central Florida**

## **CGS 2545**

### **Database Concepts**

DEPARTMENT OF ELECTRICAL ENGINEERING & COMPUTER SCIENCE  
**COMPUTER SCIENCE DIVISION**

# Structured Query Language (SQL)

- SQL
  - is a language to operate databases
  - it includes database creation, deletion, fetching rows, modifying rows, etc...
  - is an **ANSI** (American National Standards Institute) standard language
  - there are many different versions of the SQL language

# SQL

- What is SQL?
  - SQL is Structured Query Language, which is a computer language for storing, manipulating and retrieving data stored in a relational database.
  - SQL is the standard language for Relational Database System.
  - All RDMS like MySQL, MS Access, Oracle, Sybase, Informix, Postgres and SQL Server use SQL as their standard database language
  - They are using different dialects, such as
    - MS SQL Server using T-SQL
    - Oracle using PL/SQL
    - MS Access version of SQL is called JET SQL (native format) etc...

# SQL

- Why SQL?
  - SQL is widely popular because it offers the following advantages
    - Allows users to access data in the relational database management systems.
    - Allows users to describe the data.
    - Allows users to define the data in a database and manipulate that data.
    - Allows to embed within other languages using SQL modules, libraries & pre-compilers.
    - Allows users to create and drop databases and tables.
    - Allows users to create view, stored procedure, functions in a database.
    - Allows users to set permissions on tables, procedures and views

# SQL

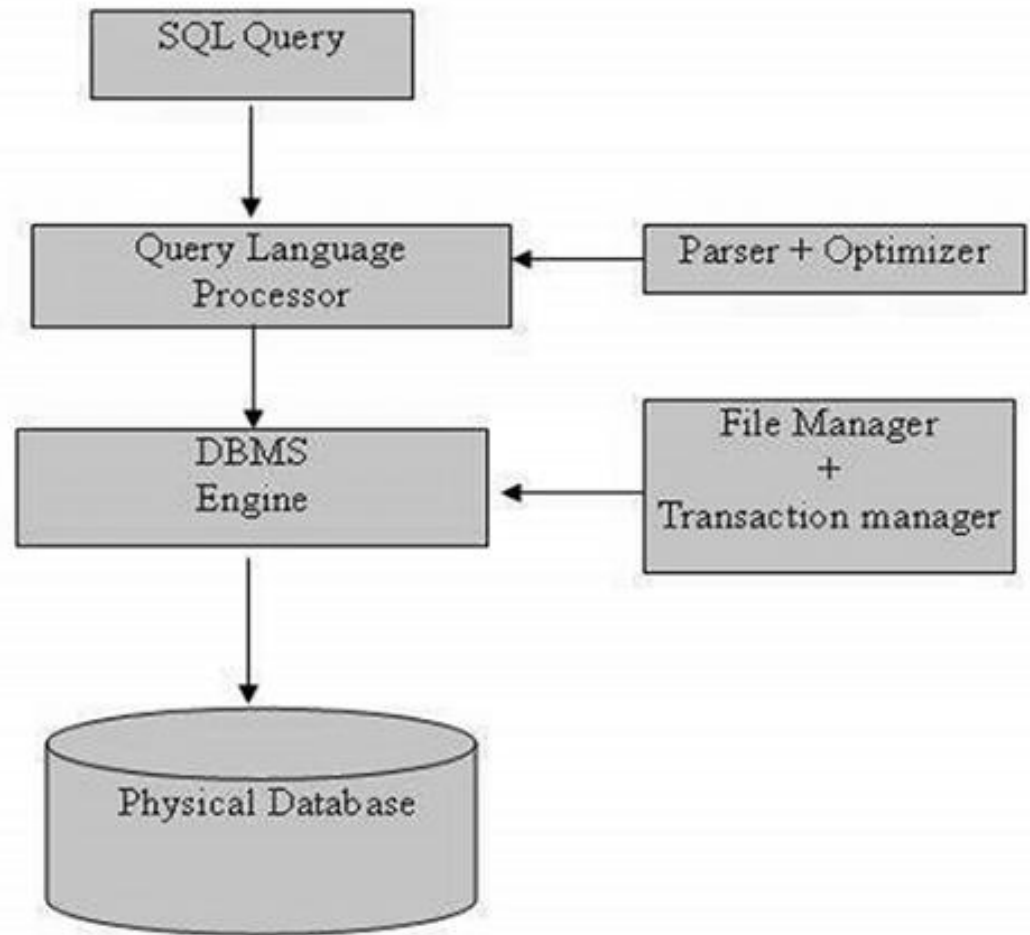
- A Brief History of SQL
  - **1970** – Dr. Edgar F. "Ted" Codd of IBM is known as the father of relational databases. He described a relational model for databases.
  - **1974** – Structured Query Language appeared.
  - **1978** – IBM worked to develop Codd's ideas and released a product named System/R.
  - **1986** – IBM developed the first prototype of relational database and standardized by ANSI. The first relational database was released by Relational Software which later came to be known as Oracle.

# SQL

- SQL Process
  - When executing an SQL command for any RDBMS, the system determines the best way to carry out the request and SQL engine figures out how to interpret the task.
  - There are various components included in this process.
  - These components are
    - Query Dispatcher
    - Optimization Engines
    - Classic Query Engine
    - SQL Query Engine, etc.
  - A classic query engine handles all the non-SQL queries, but a SQL query engine won't handle logical files.

# SQL

- This diagram displays the SQL Architecture



# SQL

- SQL Commands
  - The standard SQL commands to interact with relational databases are
    - CREATE
    - SELECT
    - INSERT
    - UPDATE
    - DELETE
    - DROP



# SQL

- SQL Commands
  - The standard SQL commands can be classified into the following groups based on their nature
    - Data Definition Language (DDL)
    - Data Manipulation Language (DML)
    - Data Control Language (DCL)

# SQL

- SQL Commands
  - DDL
    - **CREATE**
      - Creates a new table, a view of a table, or other object in the database.
    - **ALTER**
      - Modifies an existing database object, such as a table.
    - **DROP**
      - Deletes an entire table, a view of a table or other objects in the database.

# SQL

- SQL Commands
  - DML
    - **SELECT**
      - Retrieves certain records from one or more tables.
    - **INSERT**
      - Creates a record.
    - **UPDATE**
      - Modifies records.
    - **DELETE**
      - Deletes records.

# SQL

- SQL Commands
  - DCL
    - **GRANT**
      - Gives a privilege to user
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