# Database Concepts

## Lab Session 1

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DML Commands
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# MS SQL Server

- SQL Server is a relational database management system (RDBMS) developed and marketed by Microsoft.
- As a database server, the primary function of the SQL Server is to store and retrieve data used by other applications.
- SQL Server is built on top of SQL, a standard programming language for interacting with the relational databases.
- SQL server is tied to Transact-SQL, or T-SQL, the Microsoft's implementation of SQL that adds a set of proprietary programming constructs
- SQL Server consists of two main components:
  1. Database Engine
  2. SQLOS

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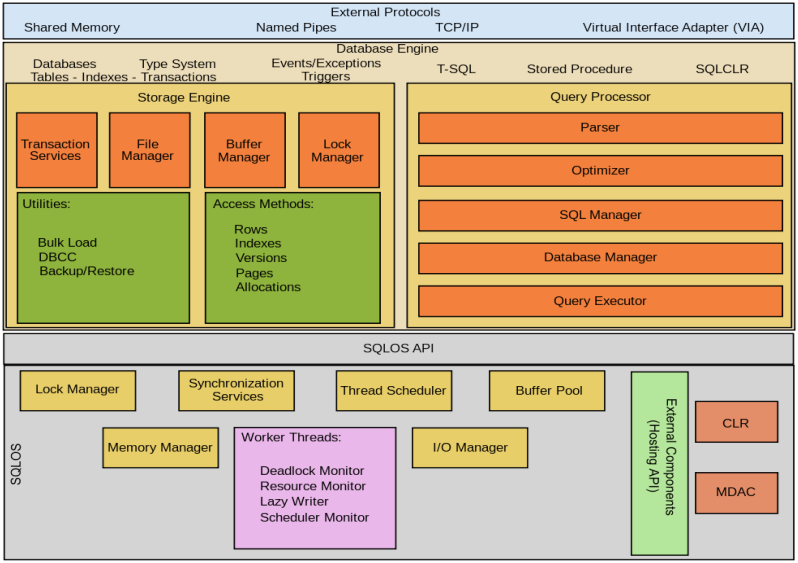
# MS SQL Architecture



# MS SQL Architecture

**Database Engine:** The Database Engine consists of a relational engine that processes queries and a storage engine that manages database files, pages, pages, index, etc The database objects such as stored procedures, views, and triggers are also created and executed by the Database Engine.

**SQLOS** : SQLOS provides many operating system services such as memory and I/O management. Other services include exception handling and synchronization services.

**Relational Engine** : The Relational Engine(query processor) contains the components that determine the best way to execute a query.

The relational engine requests data from the storage engine based on the input query and processed the results.

Some tasks of the relational engine include querying processing, memory management, thread and task management, buffer management, and distributed query processing.

**Storage Engine** : The storage engine is in charge of storage and retrieval of data from the storage systems such as disks and SAN.

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# Microsoft SQL Server Management Studio

- To interact with SQL Servers, you need to install SQL Server Management Studio (SSMS).
- The SQL Server Management Studio is a software for querying, designing, and managing SQL Server on your local computer or in the cloud.
- It provides you with tools to configure, monitor, and administer SQL Server instances.

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Let's start practicing...
select @@VERSION;

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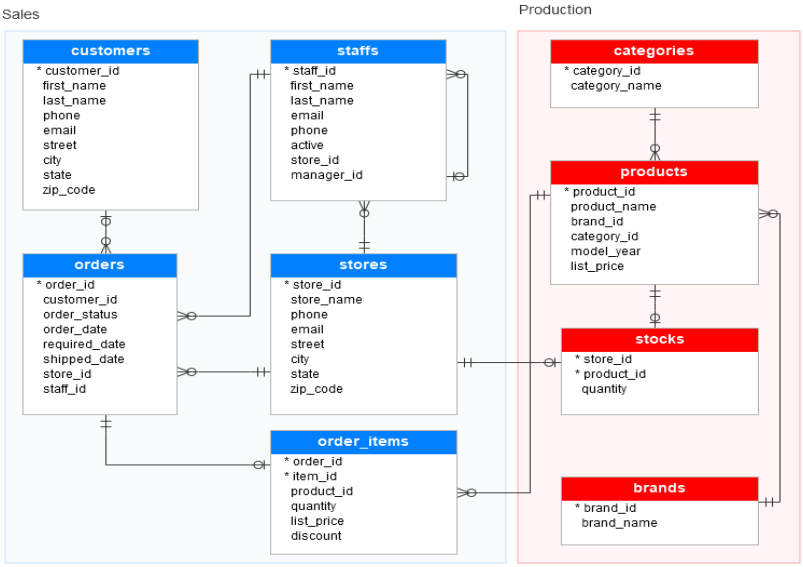
Sales
customers
* customer_id
first_name
last_name
phone
email
street
city
state
zip_code
staffs
* staff_id
first_name
last_name
email
phone
active
store_id
manager_id
orders
* order_id
customer_id
order_status
order_date
required_date
shipped_date
store_id
staff_id
stores
* store_id
store_name
phone
email
street
city
state
zip_code
order_items
* order_id
* item_id
product_id
quantity
list_price
discount
Production
categories
* category_id
category_name
products
* product_id
product_name
brand_id
category_id
model_year
list_price
stocks
* store_id
* product_id
quantity
brands
* brand_id
brand_name

# DB and Schema

- **Activity :**
  Create database 'university_db' and schema 'university' for the

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# DB and Schema

- **Activity :**
  Create database 'university_db' and schema 'university' for the
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# DDL Commands

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# DDL Commands

- **Problem :**
  Create a table 'students' with columns student_id, first_name, last_name, email_id, dob ?

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# DDL Commands

- **Problem :**
  Create a table 'students' with columns student_id, first_name, last_name, email_id, dob ?
- 
```
CREATE TABLE students
(student_id INTEGER AUTO_INCREMENT PRIMARY KEY,
first_name VARCHAR(50),
last_name VARCHAR(50),
email_id VARCHAR(255),
dob DATE);
```

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# DML Commands

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# DCL Commands

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