# MSSQL 2014

# Old fashion Data-storage

# Database

- A Database is a structured way to store lots of information.

- The information is stored in different tables.

# Relational Database

In a relational database all the tables have one or more relation with each other using Primary Keys (PK) and Foreign Keys (FK).
You can only have one PK in a table, but you may have several FK's.

ER Diagram (Entity-Relationship Diagram)

- Used for Design and Modeling of Databases.
- Specify Tables and relationship between them (Primary Keys and Foreign Keys)
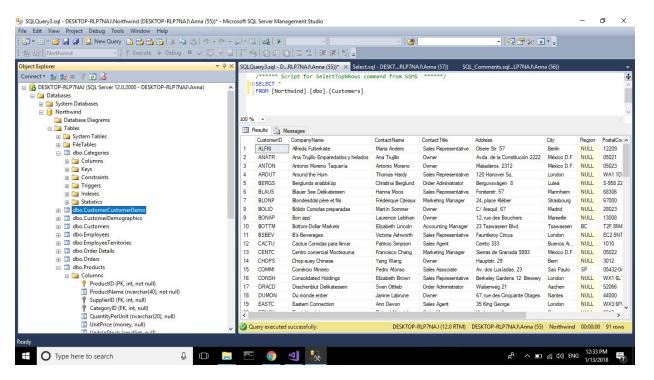
# Database Management Systems (DBMS)

- **Microsoft SQL server**
- **Oracle**
- **MySQL**
- **Microsoft Access**

# Microsoft SQL Server

**SQL Server consists of:**

1. **<u>Database Engine</u>** - has no graphical interface - it is just a service running in the background of your computer

2. **<u>Management Studio</u>** - a graphical tool for configuring and viewing the information in the database. It can be installed on the server or on the client (or both).

## Management Studio

# SQL – Structured Query Language

- SQL is a standard language for accessing databases – and manipulate data

- SQL is not case sensitive

# T-SQL

In this Tutorial we will focus on Microsoft SQL Server. SQL Server uses T-SQL (Transact-SQL). T-SQL is Microsoft's proprietary extension to SQL. T-SQL is very similar to standard SQL, but in addition it supports some extra functionality, built-in functions, etc.

# SQL – execution abilities

- SQL can execute queries against a database
- SQL can retrieve data from a database
- SQL can insert records in a database
- SQL can update records in a database
- SQL can delete records from a database
- SQL can create new databases
- SQL can create new tables in a database
- SQL can create stored procedures in a database
- SQL can create views in a database
- SQL can set permissions on tables, procedures, and views

# Data Definition Language (DDL)

The **Data Definition Language (DDL)** manages table and index structure.

The most basic items of DDL are:

- **CREATE** creates an object (a table, for example) in the database.

- **DROP** deletes an object in the database, usually irretrievably.

- **ALTER** modifies the structure an existing object in various ways—for example, adding a column to an existing table.

# SQL Constraints

Constraints are used to limit the type of data that can go into a table. Constraints can be specified when a table is created (with the CREATE TABLE statement) or after the table is created (with the ALTER TABLE statement).

Here are the most important constraints:

- PRIMARY KEY
- NOT NULL
- UNIQUE

- FOREIGN KEY
- CHECK
- DEFAULT
- IDENTITY

# Data Manipulation Language (DML)

The **Data Manipulation Language (DML)** is the subset of SQL used to add, update and delete data.

The acronym **CRUD** refers to all of the major functions that need to be implemented in a relational database application to consider it complete. Each letter in the acronym can be mapped to a standard SQL statement:

```
Create   ->   INSERT INTO
Read     ->   SELECT
Update   ->   UPDATE
Delete   ->   DELETE
```

# Database - recommended syntax

- **Tables**: Use plural form in table names, e.g., "Students" (not "Student")

- **Columns**: Use Pascal notation, e.g., "StudentId"

- **Primary Key**:

  - If the table name is "Students", name the Primary Key column "StudentId", etc.

○ Use Integer and Identity(1,1) for Primary Keys. Use UNIQUE constraint for other columns that needs to be unique

● **Data Types**:  Standardize on few/these Data types: *int*, *float*, *varchar(x), nvarchar(x), datetime*, *bit*