

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. **Database Engine** - has no graphical interface - it is just a service running in the background of your computer
2. **Management Studio** - 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

SQLQuery3.sql - DESKTOP-RLP7NAJ\Northwind (DESKTOP-RLP7NAJ\Anna (55)) - Microsoft SQL Server Management Studio

File Edit View Project Debug Tools Window Help

Object Explorer

Connect - DESKTOP-RLP7NAJ (SQL Server 12.0.2000 - DESKTOP-RLP7NAJ\Anna)

Databases

System Databases

Northwind

Database Diagrams

Tables

System Tables

FileTables

dbo.Categories

Columns

Keys

Constraints

Triggers

Indexes

Statistics

dbo.CustomerCustomerDemo

dbo.CustomerDemographics

dbo.Customers

dbo.Employees

dbo.EmployeeTerritories

dbo.Order Details

dbo.Orders

dbo.Products

Columns

ProductID (PK, int, not null)

ProductName (nvarchar(40), not null)

SupplierID (FK, int, null)

CategoryID (FK, int, null)

QuantityPerUnit (nvarchar(20), null)

UnitPrice (money, null)

UnitPriceDiscount (float, null)

SQLQuery3.sql - D:\RLP7NAJ\Anna (55) - Select.sql - DESKTOP-RLP7NAJ\Anna (57) SQL\_Comments.sql...LP7NAJ\Anna (56)

```

/***** Script for SelectTopNRows command from SSMS *****/
SELECT *
FROM [Northwind].[dbo].[Customers]
  
```

100 %

Results Messages

	CustomerID	CompanyName	ContactName	ContactTitle	Address	City	Region	PostalCode
1	ALFKI	Alfreds Futterkiste	Maria Anders	Sales Representative	Obere Str. 57	Berlin	NULL	12209
2	ANATR	Ana Trujillo Emparedados y helados	Ana Trujillo	Owner	Avda. de la Constitución 2222	México D.F.	NULL	05021
3	ANTON	Antonio Moreno Taquería	Antonio Moreno	Owner	Matadero 2312	México D.F.	NULL	05023
4	AROUT	Around the Horn	Thomas Hardy	Sales Representative	120 Hanover Sq.	London	NULL	WA1 1D
5	BERGS	Berglunds snabbköp	Christina Berglund	Order Administrator	Berguvsvägen 8	Luleå	NULL	S-958 22
6	BLAUS	Blauer See Delikatessen	Hanna Moos	Sales Representative	Fonsterstr. 57	Mannheim	NULL	68306
7	BLONP	Blondesddsl père et fils	Frédérique Citeaux	Marketing Manager	24, place Kléber	Strasbourg	NULL	67000
8	BOLID	Bólido Comidas preparadas	Martín Sommer	Owner	C/ Araquil, 67	Madrid	NULL	28023
9	BONAP	Bon app'	Laurence Leblanc	Owner	12, rue des Bouchers	Marseille	NULL	13008
10	BOTTM	Bottom-Dollar Markets	Elizabeth Lincoln	Accounting Manager	23 Tsawassen Blvd.	Tsawassen	BC	T2F 8M4
11	BSBEV	B's Beverages	Victoria Ashworth	Sales Representative	Fauntleroy Circus	London	NULL	EC2 5NT
12	CACTU	Cactus Comidas para llevar	Patricio Simpson	Sales Agent	Cento 333	Buenos Aires	NULL	1010
13	CENTC	Centro comercial Moctezuma	Francisco Chang	Marketing Manager	Sierras de Granada 9993	México D.F.	NULL	05022
14	CHOPS	Chop-suey Chinese	Yang Wang	Owner	Hauptstr. 29	Bern	NULL	3012
15	COMMI	Comércio Mineiro	Pedro Afonso	Sales Associate	Av. dos Lusíadas, 23	Sao Paulo	SP	05432-04
16	CONSH	Consolidated Holdings	Elizabeth Brown	Sales Representative	Berkeley Gardens 12 Brewery	London	NULL	WX1 6LT
17	DRACD	Drachenblut Delikatessen	Sven Ottlieb	Order Administrator	Walserweg 21	Aachen	NULL	52066
18	DUMON	Du monde entier	Janine Labrune	Owner	67, rue des Cinquante Otages	Nantes	NULL	44000
19	EASTC	Eastern Connection	Ann Devon	Sales Agent	35 King George	London	NULL	WX3 6FL

Query executed successfully. DESKTOP-RLP7NAJ (12.0 RTM) DESKTOP-RLP7NAJ\Anna (55) Northwind 00:00:00 91 rows

Ready

Type here to search

12:33 PM 1/13/2018

# 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:

<b>C</b> reate	->	INSERT INTO
<b>R</b> ead	->	SELECT
<b>U</b> ppdate	->	UPDATE
<b>D</b> eleate	->	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*