

VSB – Technical University of Ostrava
Faculty of Electrical Engineering
Department of Computer Science
Database Research Group



Introduction to Database Systems

Tutorial 1

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EA440
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Test 1 – SQL SELECT	40 pts.	min. 20 pts.
Test 2 – SQL DML operations	20 pts.	min. 10 pts.
Projekt – design of an information systém	30 pts.	min. 15 pts.
Final test	10 pts.	min. 5 pts.
Total	100 pts.	

- Graded credit
- 6 credits
- Lecturer: **Ing. Radim Bača, Ph.D.**



Week 1	Introduction to SQL, connection to MS SQL Server
Week 2	task understanding exercises
Week 3	querying in SQL
Week 4	querying in SQL
Week 5	querying in SQL
Week 6	Test 1 – SQL SELECT
Week 7	design of relational databases
Week 8	design of relational databases
Week 9	design of relational databases
Week 10	Test 2 – SQL DML Operations
Week 11	zadání semestrálního projektu

- Will be further specified during the semester.

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- All important materials
- LDAP **login** and **password**
- ***English Courses -> IDS***

homel.vsb.cz/~luk194

- Only **supplementary** materials – slides from the tutorials



- **Introduction to Design of Relational Database**
- **Connection to Microsoft SQL Server**



Introduction to Design of Relational Database



- There are many types of databases (data models). In this course, we consider only **relational databases**.

„relation“ = „table“

(it is not a relationship or a connection)

- In a well designed (relational) database, we have usually many tables. Only the tables contain data.
- In practice, the whole database is often realized using one table (Excel), which usually leads to some serious problems.



Reg. No.	Model	Manufacturer	Employee	Phone no.	E-Mail
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T6 7257	Golf	Volkswagen	John	608 128 544	john@vsb.cz
4T2 4556	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T2 0232	Passat	Volkswagen	Bob	606 425 001	bob@vsb.cz
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
5T2 4482	Passat	Volkswagen	George	508 152 722	george@vsb.cz

- What typical problems can arise, if we store the data in a single table?



Reg. No.	Model	Manufacturer	Employee	Phone no.	E-Mail
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T6 7257	Golf	Volkswagen	John	777 824 015	john@fei.cz
4T2 4556	Octavia	Skoda	John	606 087 215	john@vsb.cz
2T2 0232	Passat	Volkswagen	Bob	606 425 001	bob@vsb.cz
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
5T2 4482	Passat	Volkswagen	George	508 152 722	george@vsb.cz

A: „Can you tell me the phone number or e-mail of John?“

B: „There are three phone numbers and two emails, so I don't know ...“

Reg. No.	Model	Manufacturer	Employee	Phone no.	E-Mail
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T6 7257	Golf	Volkswagen	John	608 128 544	john@vsb.cz
4T2 4556	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T2 0232	Passat	Volkswagen	Bob	606 425 001	bob@vsb.cz
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
5T2-4482	Passat	Volkswagen	George	508-152-722	george@vsb.cz

A: „Can you tell me the e-mail of George?“

B: „He is not in the database ...“



Reg. No.	Model	Manufacturer	Employee	Phone no.	E-Mail
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T6 7257	Golf	Volkswagen	John	608 128 544	john@vsb.cz
4T2 4556	Octavia	Skoda	John	608 128 544	john@vsb.cz
2T2 0232	Passat	Volkswagen	Bob	606 425 001	bob@vsb.cz
1T3 1578	Octavia	Skoda	John	608 128 544	john@vsb.cz
5T2 4482	Passat	Volkswagen	George	508 152 722	george@vsb.cz

- Is there any better solution?



Vehicles

<u>RegNo</u>	<u>Id_Model</u>	<u>Id_Employee</u>
1T3 1578	1	1
2T6 7257	2	1
4T2 4556	1	1
2T2 0232	3	2
5T2 4482	3	3

Models

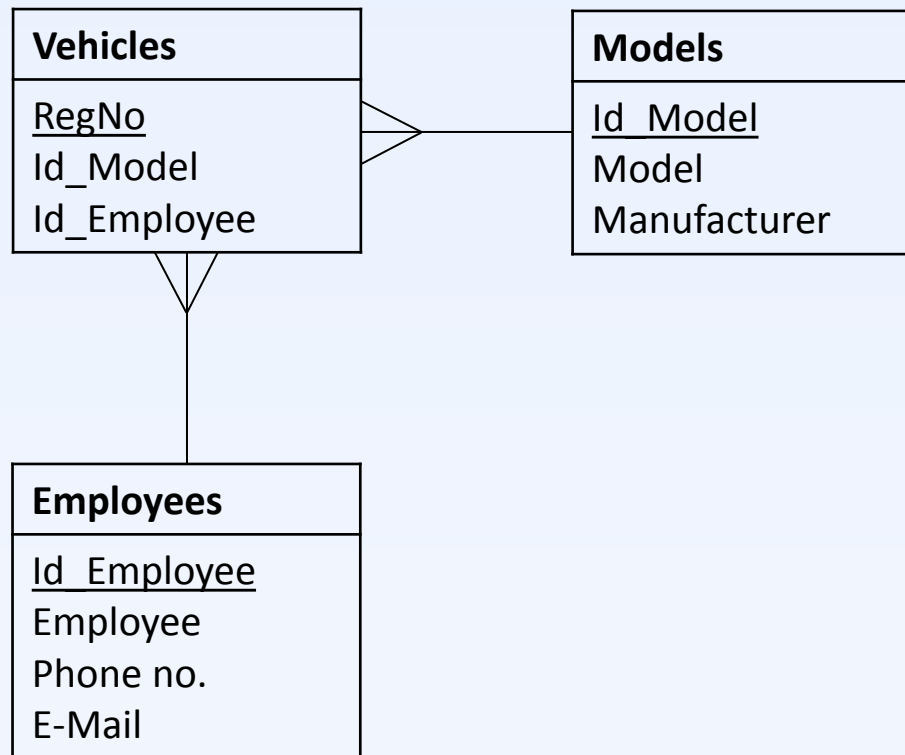
<u>Id_Model</u>	<u>Model</u>	<u>Manufacturer</u>
1	Octavia	Skoda
2	Golf	Volkswagen
3	Passat	Volkswagen

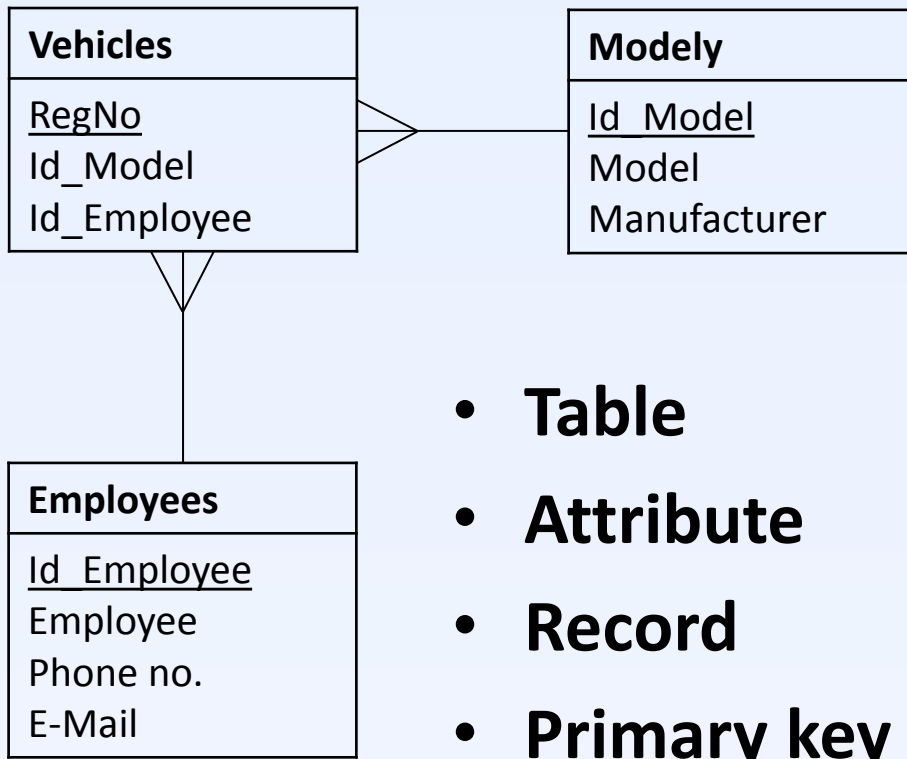
Employees

<u>Id_Employee</u>	<u>Employee</u>	<u>Phone no.</u>	<u>E-Mail</u>
1	John	608 128 544	john@vsb.cz
2	Bob	606 425 001	bob@vsb.cz
3	George	508 152 722	george@vsb.cz



- Relational database is usually modeled using **E-R diagram**.

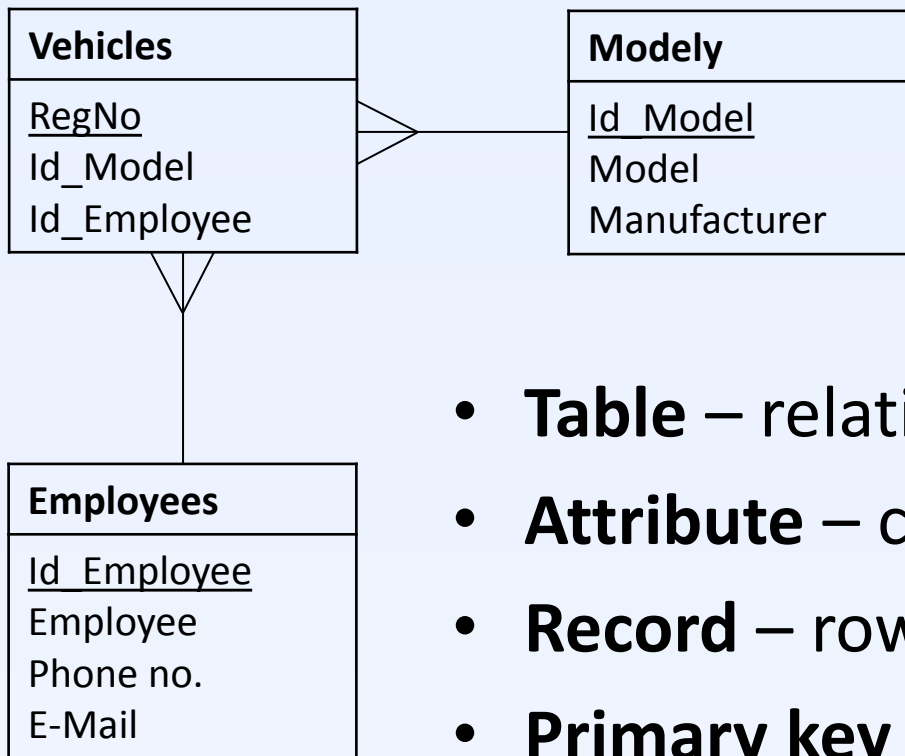




- **Table**
- **Attribute**
- **Record**
- **Primary key**

- **Foreign key**





- **Table** – relation
- **Attribute** – column
- **Record** – row
- **Primary key** – one or more attributes uniquely identifying each record
- **Foreign key** – points to a primary key



Connection to MS SQL Server



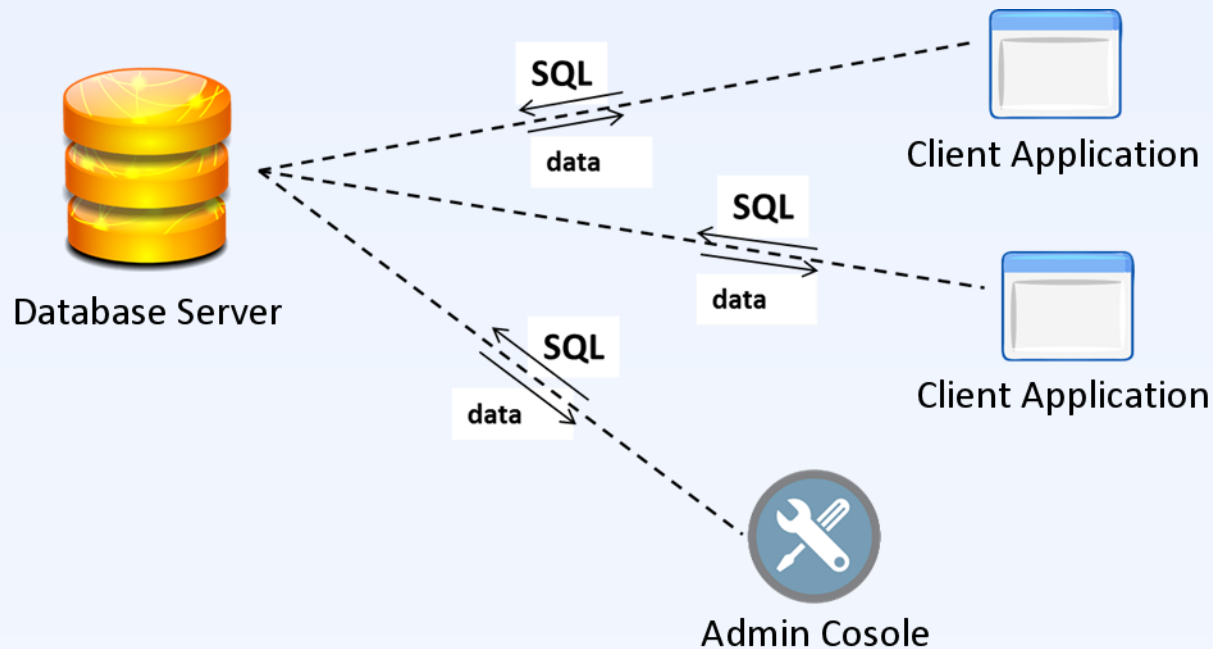
- **SQL** – Structured Query Language.
- Standardized language for communication with a relational database.
- Supported by almost all relational database management systems.

- Creating, dropping or altering tables
- Inserting, updating or deleting records
- Querying the data

- Until the Test 1, we will concern only with **querying the data**.



- In IDS, we will use **Microsoft SQL Server 2012** database management system.
- We will use **Microsoft SQL Server Management Studio** client application.



New query

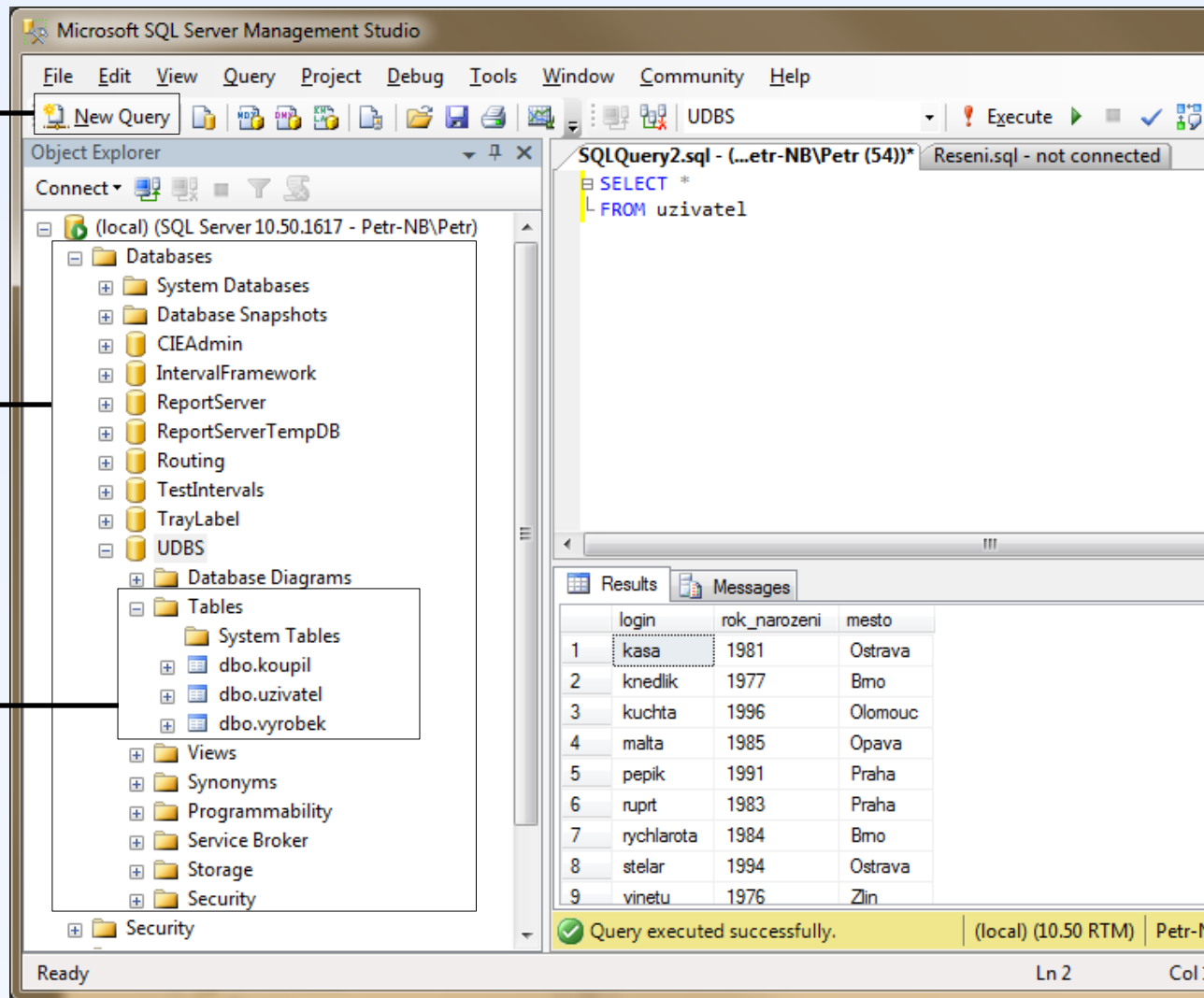
Opens a new empty tab for a script

List of databases

Many databases can run on a single server

List of tables

Individual tables in a database



Current database

Always make sure which database is in use.

Runs the script
Key F5

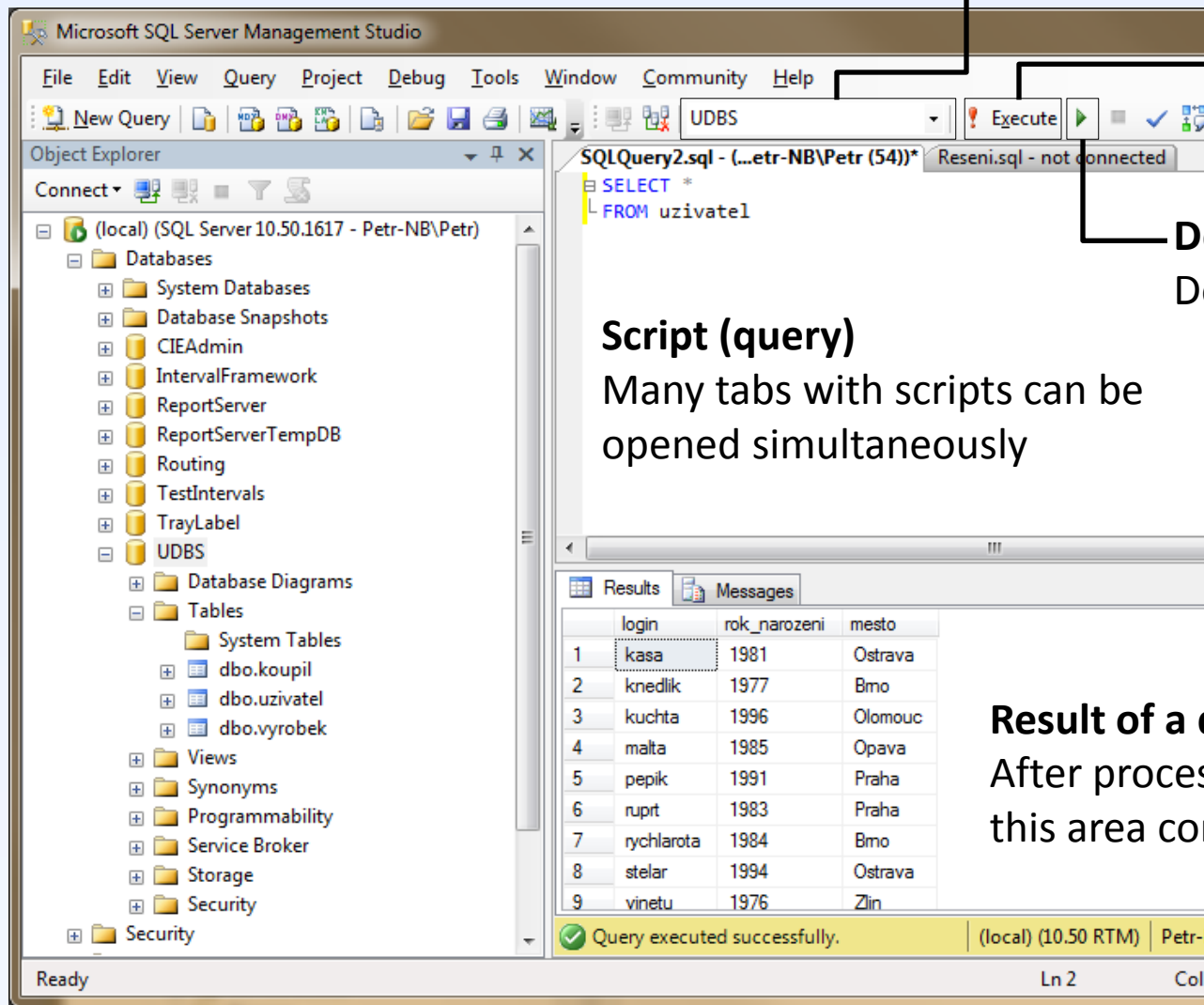
Debugs the script
Do not use!

Script (query)

Many tabs with scripts can be opened simultaneously

Result of a query

After processing the query, this area contains the result.



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