**Structured Query Language (SQL)**

**Homework**

1. What is SQL? What is DML? What is DDL? Recite the most important SQL commands.
   * What is SQL? - SQL is a standard language for accessing and manipulating databases.
   * What is DML? – Data manipulation language (Used commands- SELECT, INSERT, UPDATE, DELETE)
   * What is DDL? – Data definition language (Used commands: CREATE, DROP, ALTER, GRAND, REVOKE)
2. What is Transact-SQL (T-SQL)? - T-SQL is [Microsoft](https://en.wikipedia.org/wiki/Microsoft)'s and [Sybase](https://en.wikipedia.org/wiki/Sybase)'s proprietary extension to [SQL](https://en.wikipedia.org/wiki/SQL). SQL, the acronym for Structured Query Language, is a [standardized](https://en.wikipedia.org/wiki/SQL#Standardization) computer language that was originally developed by IBM for querying, altering and defining relational databases, using [declarative](https://en.wikipedia.org/wiki/Declarative_programming) statements. T-SQL expands on the SQL standard to include [procedural](https://en.wikipedia.org/wiki/Procedural_programming) programming, [local variables](https://en.wikipedia.org/wiki/Local_variable), various support functions for string processing, date processing, mathematics, etc. and changes to the [DELETE](https://en.wikipedia.org/wiki/Delete_(SQL)) and [UPDATE](https://en.wikipedia.org/wiki/Update_(SQL)) statements. These additional features make Transact-SQL [Turing complete](https://en.wikipedia.org/wiki/Turing_complete).
3. Write a SQL query to find all information about all departments (use "TelerikAcademy" database).

USE TelerikAcademy

SELECT \*

FROM dbo.Departments

1. Write a SQL query to find all department names.

USE TelerikAcademy

SELECT d.Name

FROM dbo.Departments d

1. Write a SQL query to find the salary of each employee.

USE TelerikAcademy

SELECT e.Salary

FROM dbo.Employees e

1. Write a SQL to find the full name of each employee.

USE TelerikAcademy

SELECT e.FirstName + ' ' + e.LastName AS 'Employee Full Name'

FROM dbo.Employees e

1. Write a SQL query to find the email addresses of each employee (by his first and last name). Consider that the mail domain is telerik.com. Emails should look like “[John.Doe@telerik.com](mailto:John.Doe@telerik.com)". The produced column should be named "Full Email Addresses".

USE TelerikAcademy

SELECT e.FirstName+ '.'+ e.LastName+'@telerik.com' AS 'Full Email Addresses'

FROM dbo.Employees e

1. Write a SQL query to find all different employee salaries.

USE TelerikAcademy

SELECT DISTINCT e.Salary

FROM dbo.Employees e

1. Write a SQL query to find all information about the employees whose job title is “Sales Representative“.

USE TelerikAcademy

SELECT \*

FROM dbo.Employees e

WHERE e.JobTitle= 'Sales Representative'

1. Write a SQL query to find the names of all employees whose first name starts with "SA".
   * Case insensitive search:

USE TelerikAcademy

SELECT e.FirstName, e.LastName

FROM dbo.Employees e

WHERE e.FirstName LIKE 'SA%'

* + Case sensitive search:

USE TelerikAcademy

SELECT e.FirstName, e.LastName

FROM dbo.Employees e

WHERE e.FirstName COLLATE Latin1\_General\_CS\_AS LIKE 'SA%'

1. Write a SQL query to find the names of all employees whose last name contains "ei".
   * Case insensitive search:

USE TelerikAcademy

SELECT e.FirstName, e.LastName

FROM dbo.Employees e

WHERE e.LastName LIKE '%ei%'

* + Case sensitive search:

USE TelerikAcademy

SELECT e.FirstName, e.LastName

FROM dbo.Employees e

WHERE e.LastName COLLATE Latin1\_General\_CS\_AS LIKE '%ei%'

1. Write a SQL query to find the salary of all employees whose salary is in the range [20000…30000].

USE TelerikAcademy

SELECT e.Salary

FROM dbo.Employees e

WHERE e.Salary BETWEEN 20000 AND 30000

1. Write a SQL query to find the names of all employees whose salary is 25000, 14000, 12500 or 23600.

USE TelerikAcademy

SELECT e.FirstName, e.LastName

FROM dbo.Employees e

WHERE e.Salary IN(25000, 14000, 12500, 23600)

1. Write a SQL query to find all employees that do not have manager.

USE TelerikAcademy

SELECT e.FirstName, e.LastName, e.ManagerID

FROM dbo.Employees e

WHERE e.ManagerID IS NUll

1. Write a SQL query to find all employees that have salary more than 50000. Order them in decreasing order by salary.

USE TelerikAcademy

SELECT E.FirstName, e.LastName, e.Salary

FROM dbo.Employees e

WHERE e.Salary >50000

ORDER BY e.Salary DESC

1. Write a SQL query to find the top 5 best paid employees.

USE TelerikAcademy

SELECT TOP(5) e.FirstName, e.LastName, e.Salary

FROM dbo.Employees e

WHERE e.Salary >50000

ORDER BY e.Salary DESC

1. Write a SQL query to find all employees along with their address. Use inner join with ON clause.

USE TelerikAcademy

SELECT e.FirstName, e.LastName, a.AddressText, t.Name AS 'Town'

FROM dbo.Employees e

INNER JOIN dbo.Addresses a

ON e.AddressID= a.AddressID

INNER JOIN dbo.Towns t

ON a.TownID= t.TownID

1. Write a SQL query to find all employees and their address. Use equijoins (conditions in the WHERE clause).

USE TelerikAcademy

SELECT e.FirstName, e.LastName, a.AddressText, t.Name

FROM dbo.Employees e, dbo.Addresses a, dbo.Towns t

WHERE (e.AddressID= a.AddressID) AND (a.TownID= t.TownID)

1. Write a SQL query to find all employees along with their manager.

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name', m.FirstName + ' ' + m.LastName AS 'Manager Name'

FROM dbo.Employees e

INNER JOIN dbo.Employees m

ON e.ManagerID = m.EmployeeID

1. Write a SQL query to find all employees, along with their manager and their address. Join the 3 tables: Employees e,Employees m and Addresses a.

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name', m.FirstName + ' ' + m.LastName AS 'Manager Name',

a.AddressText AS 'Employ Address'

FROM dbo.Employees e

INNER JOIN dbo.Employees m

ON e.ManagerID = m.EmployeeID

INNER JOIN dbo.Addresses a

ON e.AddressID= a.AddressID

1. Write a SQL query to find all departments and all town names as a single list. Use UNION.

USE TelerikAcademy

SELECT d.Name

FROM dbo.Departments d

UNION

SELECT t.Name

FROM dbo.Towns t

1. Write a SQL query to find all the employees and the manager for each of them along with the employees that do not have manager. Use right outer join. Rewrite the query to use left outer join.

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name', m.FirstName + ' ' + m.LastName AS 'Manager Name'

FROM dbo.Employees e

RIGHT OUTER JOIN dbo.Employees m

ON e.ManagerID = m.EmployeeID;

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name', m.FirstName + ' ' + m.LastName AS 'Manager Name'

FROM dbo.Employees e

LEFT OUTER JOIN dbo.Employees m

ON e.ManagerID = m.EmployeeID;

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name', m.FirstName + ' ' + m.LastName AS 'Manager Name'

FROM dbo.Employees e

FULL OUTER JOIN dbo.Employees m

ON e.ManagerID = m.EmployeeID;

1. Write a SQL query to find the names of all employees from the departments "Sales" and "Finance" whose hire year is between 1995 and 2005.

USE TelerikAcademy

SELECT e.FirstName+ ' ' + e.LastName AS 'Employ Name',d.Name, e.HireDate

FROM dbo.Employees e

INNER JOIN dbo.Departments d

ON e.DepartmentID = d.DepartmentID

WHERE (d.Name= 'Sales' OR d.Name='Finance') AND

( e.HireDate > '1995' AND

e.HireDate< '2005')