# Exercises: CRUD

This document defines the **exercise assignments** for the ["Databases Basics - MSSQL" course @ Software University.](https://softuni.bg/trainings/3491/ms-sql-september-2021)

## Examine the Databases

Download and get familiar with the **SoftUni**, **Diablo** and **Geography** database schemas and tables. You will use them in the current and following exercises to write queries.

# Part I – Queries for SoftUni Database

## Find All Information About Departments

Create an SQL query that finds all available information about the Departments.

### Example

|  |  |  |
| --- | --- | --- |
| **DepartmentID** | **Name** | **ManagerID** |
| 1 | Engineering | 12 |
| 2 | Tool Design | 4 |
| 3 | Sales | 273 |
| … | … | … |

USE [SoftUni]

SELECT \* FROM [Departments]

## Find all Department Names

Create an SQL query that finds **all Department names**.

### Example

|  |
| --- |
| **Name** |
| Engineering |
| Tool Design |
| Sales |
| … |

SELECT [Name] FROM [Departments]

## Find Salary of Each Employee

Create an SQL query that finds the **first name**, **last name,** and **salary** for each employee.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Salary** |
| Guy | Gilbert | 12500.00 |
| Kevin | Brown | 13500.00 |
| Roberto | Tamburello | 43300.00 |
| … | … | … |

SELECT [FirstName], [LastName], [Salary] FROM [Employees]

## Find Full Name of Each Employee

Create an SQL query that finds the **first**, **middle,** and **last name** for each employee.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **MiddleName** | **LastName** |
| Guy | R | Gilbert |
| Kevin | F | Brown |
| Roberto | NULL | Tamburello |
| … | … | … |

SELECT [FirstName], [MiddleName], [LastName] FROM [Employees]

## Find Email Address of Each Employee

Create an SQL query that finds the **email address** for each employee, by his **first and last name**. Consider that the email domain is **softuni.bg**. Emails should look like "John.Doe@softuni.bg". The **produced column** should be named **"Full Email Address"**.

### Example

|  |
| --- |
| **Full Email Address** |
| Guy.Gilbert@softuni.bg |
| Kevin.Brown@softuni.bg |
| Roberto.Tamburello@softuni.bg |
| … |

SELECT CONCAT ([FirstName], '.', [LastName], '@', 'softuni.bg')

AS [Full Email Address]

FROM [Employees]

## Find All Different Employee’s Salaries

Create an SQL query that finds **all different employee’s salaries**. Display the salaries only in a column named "**Salary**".

### Example

|  |
| --- |
| **Salary** |
| 9000.00 |
| 9300.00 |
| 9500.00 |
| … |

SELECT DISTINCT [Salary] FROM [Employees]

## Find all Information About Employees

Create an SQL query that finds **all information** about the employees whose **job title** is "**Sales Representative”.**

### Example

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **First**  **Name** | **Last**  **Name** | **Middle**  **Name** | **Job Title** | **DeptID** | **Mngr**  **ID** | **HireDate** | **Salary** | **AddressID** |
| 275 | Michael | Blythe | G | Sales Representative | 3 | 268 | … | 23100.00 | 60 |
| 276 | Linda | Mitchell | C | Sales Representative | 3 | 268 | … | 23100.00 | 170 |
| 277 | Jillian | Carson | NULL | Sales Representative | 3 | 268 | … | 23100.00 | 61 |
| … | … | … | … | … | … | … | … | … | … |

SELECT \* FROM [Employees]

WHERE [JobTitle] = 'Sales Representative'

## Find Names of All Employees by Salary in Range

Create an SQL query to find the **first name**, **last name**, and **job title** for all employees whose salary is in a **range** **between** **20000** and **30000**.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **JobTitle** |
| Rob | Walters | Senior Tool Designer |
| Thierry | D'Hers | Tool Designer |
| JoLynn | Dobney | Production Supervisor |
| … | … | … |

SELECT [FirstName], [LastName], [JobTitle] FROM [Employees]

WHERE [Salary] BETWEEN 20000 AND 30000

--or--

SELECT [FirstName], [LastName], [JobTitle] FROM [Employees]

WHERE [Salary] >= 20000 AND [Salary] < 30000

## Find Names of All Employees

Create an SQL query that finds the **full name** of all employees whose **salary** is exactly **25000, 14000, 12500, or 23600**. The result should be displayed in a column named "Full Name", which is a combination of **first**, **middle**, and **last** names separated by a **single space**.

### Example

|  |
| --- |
| **Full Name** |
| Guy R Gilbert |
| Thierry B D'Hers |
| JoLynn M Dobney |

SELECT CONCAT([FirstName], ' ', [MiddleName], ' ', [LastName])

AS [Full Name]

FROM [Employees]

WHERE [Salary] IN (12500, 14000, 23600, 25000)

--or—

SELECT CONCAT\_WS(' ', [FirstName], [MiddleName], [LastName])

AS [Full Name]

FROM [Employees]

WHERE [Salary] IN (12500, 14000, 23600, 25000)

## Find All Employees Without Manager

Create an SQL query that finds **the first and last names** of those employees that **do not have a manager**.

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Ken | Sanchez |
| Svetlin | Nakov |
| … | … |

SELECT [FirstName], [LastName] FROM [Employees]

WHERE [ManagerID] IS NULL

## Find All Employees with Salary More Than 50000

Create an SQL query that finds **the first name**, **last name**, and **salary** for employees with **a salary** higher than 50000. Order the result in decreasing order by salary.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Salary** |
| Ken | Sanchez | 125500.00 |
| James | Hamilton | 84100.00 |
| … | … | … |

SELECT [FirstName], [LastName], [Salary] FROM [Employees]

WHERE [Salary] > 50000

ORDER BY [Salary] DESC

## Find 5 Best Paid Employees.

Create an SQL query that finds the **first and last names**of the **5 best-paid Employees,** ordered in **descending by their salary.**

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Ken | Sanchez |
| James | Hamilton |
| … | … |

SELECT TOP(5) [FirstName], [LastName] FROM [Employees]

ORDER BY [Salary] DESC

## Find All Employees Except Marketing

Create an SQL query that finds the **first**and**last names** of all employees whose **department ID is not 4.**

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Guy | Gilbert |
| Roberto | Tamburello |
| Rob | Walters |

SELECT [FirstName], [LastName] FROM [Employees]

WHERE [DepartmentID] != '4'

## Sort Employees Table

Create an Write a SQL query that sorts all records in the Employees table by the following criteria:

* By **salary** in **decreasing** order
* Then by the **first name** **alphabetically**
* Then by the **last name descending**
* Then by **middle name alphabetically**

### Example

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **ID** | **First**  **Name** | **Last**  **Name** | **Middle**  **Name** | **Job Title** | **DeptID** | **Mngr**  **ID** | **HireDate** | **Salary** | **AddressID** |
| 109 | Ken | Sanchez | J | Chief Executive Officer | 16 | NULL | … | 125500.00 | 177 |
| 148 | James | Hamilton | R | Vice President of Production | 7 | 109 | … | 84100.00 | 158 |
| 273 | Brian | Welcker | S | Vice President of Sales | 3 | 109 | … | 72100.00 | 134 |
| … | … | … | … | … | … | … | … | … | … |

SELECT \* FROM [Employees]

ORDER BY [Salary] DESC, [FirstName] ASC, [LastName] DESC, [MiddleName] ASC

## Create View Employees with Salaries

Create an SQL query that creates a view "**V\_EmployeesSalaries"** with **first name**, **last name**, and **salary** for each employee.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **Salary** |
| Guy | Gilbert | 12500.00 |
| Kevin | Brown | 13500.00 |
| … | … | … |

CREATE VIEW [V\_EmployeesSalaries] AS (

SELECT [FirstName], [LastName], [Salary] FROM [Employees])

## Create View Employees with Job Titles

Create an SQL query to create view "**V\_EmployeeNameJobTitle"**with **full employee name** and **job title**. When the middle name is **NULL** replace it with **an empty string ('')**.

### Example

|  |  |
| --- | --- |
| **Full Name** | **Job Title** |
| Guy R Gilbert | Production Technician |
| Kevin F Brown | Marketing Assistant |
| Roberto Tamburello | Engineering Manager |
| … | … |

CREATE VIEW [V\_EmployeeNameJobTitle] AS (

SELECT CONCAT([FirstName], ' ', [MiddleName], ' ', [LastName]) AS [Full Name],

[JobTitle] AS [Job Title]

FROM [Employees])

## Distinct Job Titles

Create an SQL query that finds **all distinct job titles**.

### Example

|  |
| --- |
| **JobTitle** |
| Accountant |
| Accounts Manager |
| Accounts Payable Specialist |
| … |

SELECT DISTINCT [JobTitle] FROM [Employees]

## Find First 10 Started Projects

Create an SQL query that finds **the first 10 projects which were started**, select **all information about them**, and **sort**the result by **starting date**, **then by name**.

### Example

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **ID** | **Name** | **Description** | **StartDate** | **EndDate** |
| 6 | HL Road Frame | Research, design and development of HL Road … | 1998-05-02 00:00:00 | 2003-06-01 00:00:00 |
| 2 | Cycling Cap | Research, design and development of C… | 2001-06-01 00:00:00 | 2003-06-01 00:00:00 |
| 5 | HL Mountain Frame | Research, design and development of HL M… | 2001-06-01 00:00:00 | 2003-06-01 00:00:00 |
| … | … | … | … | … |

SELECT TOP (10) \* FROM [Projects]

ORDER BY [StartDate] ASC, [Name] ASC

## Last 7 Hired Employees

Create an SQL query that finds **the last 7 hired employees, select** **their first, last name, and hire date**.

### Example

|  |  |  |
| --- | --- | --- |
| **FirstName** | **LastName** | **HireDate** |
| Rachel | Valdez | 2005-07-01 00:00:00 |
| Lynn | Tsoflias | 2005-07-01 00:00:00 |
| Syed | Abbas | 2005-04-15 00:00:00 |
| … | … | … |

SELECT TOP (7) [FirstName], [LastName], [HireDate] FROM [Employees]

ORDER BY [HireDate] DESC

## Increase Salaries

Create an SQL query that increases salaries by **12%** of all employees that work in the ether **Engineering**, **Tool Design**, **Marketing**, or **Information Services** departments. As a result, select and display**only the "Salaries" column** from the **Employees** table. After that exercise, you should restore the database to the original data.

### Example

|  |
| --- |
| **Salary** |
| 12500.00 |
| 15120.00 |
| 48496.00 |
| 33376.00 |
| … |

UPDATE [Employees]

SET [Salary] += [Salary] \* 0.12

WHERE [DepartmentID] IN (1, 2, 4, 11)

SELECT [Salary] FROM [Employees]

# Part II – Queries for Geography Database

## All Mountain Peaks

Display all **mountain peaks** in alphabetical order.

### Example

|  |
| --- |
| **PeakName** |
| Aconcagua |
| Banski Suhodol |
| Batashki Snezhnik |
| … |

SELECT [PeakName] FROM [Peaks]

ORDER BY [PeakName] ASC

## Biggest Countries by Population

Find the 30 biggest countries by population located in **Europe**. Display the "**CountryName"** and "**Population"**. Sort the results by population (from biggest to smallest), then by country alphabetically.

### Example

|  |  |
| --- | --- |
| **CountryName** | **Population** |
| Russia | 140702000 |
| Germany | 81802257 |
| France | 64768389 |
| … | … |

SELECT TOP (30) [CountryName], [Population] FROM [Countries]

WHERE [ContinentCode] = 'EU'

ORDER BY [Population] DESC, [CountryName] ASC

## \*Countries and Currency (Euro / Not Euro)

Find all countries along with information about their currency. Display the "**CountryName"**, "**CountryCode"**, and information about its "**Currency"**: either "**Euro**" or "**Not Euro**". Sort the results by country name alphabetically.

\*Hint: Use **CASE** … **WHEN**.

### Example

|  |  |  |
| --- | --- | --- |
| **CountryName** | **CountryCode** | **Currency** |
| Afghanistan | AF | Not Euro |
| Åland | AX | Euro |
| Albania | AL | Not Euro |
| … | … | … |

SELECT [CountryName], [CountryCode],

CASE

WHEN [CurrencyCode] = 'EUR' THEN 'Euro'

ELSE 'Not Euro'

END AS [Currency]

FROM [Countries]

ORDER BY [CountryName]

# Part III – Queries for Diablo Database

## All Diablo Characters

Display all **characters** in alphabetical order.

### Example

|  |
| --- |
| **Name** |
| Amazon |
| Assassin |
| Barbarian |
| … |

SELECT [Name] FROM [Characters]

ORDER BY [Name] ASC