# Exercises: Basic CRUD

This document defines the **exercise assignments** for the ["Databases Basics - MSSQL" course @ Software University.](https://softuni.bg/courses/databases-basics-ms-sql-server)

## 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

Write a SQL query to find **all available information about the Departments.**

### Solution :

### SELECT \* FROM Departments;

### Example

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

## Find all Department Names

Write SQL query to find **all Department names**.

### Solution :

**SELECT [Name] FROM Departments;**

### Example

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

## Find Salary of Each Employee

Write SQL query to find the **first name**, **last name** and **salary** of each employee.

### Solution :

**SELECT FirstName, LastName, Salary FROM Employees;**

### Example

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

## Find Full Name of Each Employee

Write SQL query to find the **first**, **middle** and **last name** of each employee.

### Solution :

**SELECT FirstName, MiddleName, LastName FROM Employees;**

### Example

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

## Find Email Address of Each Employee

Write a SQL query to find the **email address** of 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"**.

### Solution :

**SELECT FirstName + '.' + LastName + '@softuni.bg' AS [Full Email Address]**

**FROM Employees;**

### Example

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

## Find All Different Employee’s Salaries

Write a SQL query to find **all different employee’s salaries**. Show only the salaries.

### Solution :

**SELECT DISTINCT Salary FROM Employees;**

### Example

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

## Find all Information About Employees

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

### Solution :

**SELECT \* FROM Employees**

**WHERE JobTitle = '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 |
| … | … | … | … | … | … | … | … | … | … |

## Find Names of All Employees by Salary in Range

Write a SQL query to find the **first name**, **last name** and **job title** of all employees whose **salary is in the** **range [20000, 30000].**

### Solution :

**SELECT FirstName, LastName, JobTitle FROM Employees**

**WHERE Salary BETWEEN 20000 AND 30000**

### Example

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

## Find Names of All Employees

Write a SQL query to find the **full name** of all employees whose **salary** is **25000, 14000, 12500 or 23600**. Full Name is combination of **first**, **middle** and **last** name (separated with **single space**) and they should be **in one column** called **“Full Name”.**

### Solution :

**SELECT FirstName + ' ' + MiddleName + ' ' + LastName AS [Full Name] FROM Employees**

**WHERE Salary IN (25000, 14000, 12500, 23600)**

### Example

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

## Find All Employees Without Manager

Write a SQL query to find **first and last names** about those employees that **does not have a manager**.

### Solution :

**SELECT [FirstName], [LastName] from Employees**

**WHERE ManagerID IS NULL**

### Example

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

## Find All Employees with Salary More Than 50000

Write a SQL query to find **first name**, **last name** and **salary** of those employees who has salary more than 50000. Order them in decreasing order by salary.

### Solution :

**SELECT [FirstName], [LastName], Salary from Employees**

**WHERE Salary > 50000**

**ORDER BY Salary DESC**

### Example

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

## Find 5 Best Paid Employees.

Write SQL query to find **first and last names** about **5 best paid Employees** ordered **descending by their salary.**

### Solution :

**SELECT TOP (5) [FirstName], [LastName] from Employees**

**ORDER BY Salary DESC**

### Example

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

## Find All Employees Except Marketing

Write a SQL query to find the **first** and **last names** of all employees whose **department ID is different from 4.**

### Solution :

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

**WHERE NOT(DepartmentID = 4)**

### Example

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

## Sort Employees Table

Write a SQL query to sort all records in the Employees table by the following criteria:

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

### Solution :

**SELECT \* FROM Employees**

**ORDER BY Salary DESC,**

**[FirstName] ASC,**

**LastName DESC,**

**MiddleName ASC**

### 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 |
| … | … | … | … | … | … | … | … | … | … |

## Create View Employees with Salaries

Write a SQL query to create a view **V\_EmployeesSalaries** with **first name**, **last name** and **salary** for each employee.

### Solution :

**CREATE VIEW V\_EmployeesSalaries AS**

**SELECT FirstName, LastName, Salary**

**FROM Employees**

### Example

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

## Create View Employees with Job Titles

Write a SQL query to create view **V\_EmployeeNameJobTitle** with **full employee name** and **job title**. When middle name is **NULL** replace it with **empty string (‘’)**.

### Solution :

**CREATE VIEW V\_EmployeeNameJobTitle AS**

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

**FROM Employees**

### Example

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

## Distinct Job Titles

Write a SQL query to find **all distinct job titles**.

### Solution :

**SELECT DISTINCT JobTitle FROM Employees**

### Example

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

## Find First 10 Started Projects

Write a SQL query to find **first 10 started projects**. Select **all information about them** and **sort** them **by start date**, **then by name**.

### Solution :

**SELECT TOP(10) \* FROM Projects**

**ORDER BY StartDate, [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 |
| … | … | … | … | … |

## Last 7 Hired Employees

Write a SQL query to find **last 7 hired employees**. Select **their first, last name and their hire date**.

### Solution :

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

ORDER BY HireDate DESC

### 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 |
| … | … | … |

## Increase Salaries

Write a SQL query to increase salaries of all employees that are in the **Engineering**, **Tool Design**, **Marketing** or **Information Services** department by **12%**. Then **select Salaries column** from the **Employees** table. After that exercise restore your database to revert those changes.

### Solution :

**UPDATE Employees**

**SET Salary+=Salary\*0.12**

**WHERE DepartmentID IN (1, 2, 4, 11)**

**SELECT Salary FROM Employees**

### Example

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

# Part II – Queries for Geography Database

## All Mountain Peaks

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

### Solution :

**SELECT PeakName FROM Peaks**

**ORDER BY PeakName**

### Example

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

## Biggest Countries by Population

Find the 30 biggest countries by population **from Europe**. Display the country name and population. Sort the results by population (from biggest to smallest), then by country alphabetically.

### Solution :

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

**WHERE ContinentCode = 'EU'**

**ORDER BY [Population] DESC, CountryName**

### Example

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

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

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

\*Hint: Use **CASE** … **WHEN**.

### Solution :

**SELECT CountryName, CountryCode,**

**CASE WHEN CurrencyCode = 'EUR' THEN 'Euro'**

**ELSE 'Not Euro'**

**END AS [Currency]**

**FROM Countries**

**ORDER BY CountryName**

### Example

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

# Part III – Queries for Diablo Database

## All Diablo Characters

Display all **characters** in alphabetical order.

### Solution :

**SELECT [Name] FROM Characters**

**ORDER BY [Name]**

### Example

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