Exercises: Joins, Subqueries, CTE and Indices

This document defines the **exercise assignments** for the "Databases Basics - MSSQL" course @ Software University.
For problems from 1 to 11 (inclusively) use "**SoftUni**" database and for the other problems – "**Geography**".

Problem 1. Employee Address

Write a query that selects:

- **EmployeeId**
- **JobTitle**
- **AddressId**
- **AddressText**

Return the **first 5** rows **sorted** by **AddressId** in **ascending** order.

Example:

EmployeeId	JobTitle	AddressId	AddressText
142	Production Technician	1	108 Lakeside Court
30	Human Resources Manager	2	1341 Prospect St
…	…	…	…

Problem 2. Addresses with Towns

Write a query that selects:

- **FirstName**
- **LastName**
- **Town**
- **AddressText**

Sorted by **FirstName** in **ascending** order then by **LastName**. Select **first 50** employees.

Example:

FirstName	LastName	Town	AddressText
A.Scott	Wright	Newport Hills	1400 Gate Drive
Alan	Brewer	Kenmore	8192 Seagull Court
…	…	…	…

Problem 3. Sales Employee

Write a query that selects:

- **EmployeeID**
- **FirstName**
- **LastName**
- **DepartmentName**

Sorted by **EmployeeID** in **ascending** order. Select only **employees** from "**Sales**" department.

Example:

EmployeeID	FirstName	LastName	DepartmentName
268	Stephen	Jiang	Sales
273	Brian	Welcker	Sales
…	…	…	…

Problem 4. Employee Departments

Write a query that selects:

- **EmployeeID**
- **FirstName**
- **Salary**
- **DepartmentName**

Filter only **employees** with **salary higher than 15000**. Return the **first 5** rows **sorted** by **DepartmentID** in **ascending** order.

Example:

EmployeeID	FirstName	Salary	DepartmentName
3	Roberto	43300.00	Engineering
9	Gail	32700.00	Engineering
…	…	…	…

Problem 5. Employees Without Project

Write a query that selects:

- **EmployeeID**
- **FirstName**

Filter only **employees without** a **project**. Return the **first 3** rows **sorted** by **EmployeeID** in **ascending** order.

Example:

EmployeeID	FirstName
2	Kevin
6	David
…	…

Problem 6. Employees Hired After

Write a query that selects:

- **FirstName**
- **LastName**
- **HireDate**
- **DeptName**

Filter only **employees hired after 1.1.1999** and are from either **"Sales"** or **"Finance"** departments, **sorted** by **HireDate** (**ascending**).

Example:

FirstName	LastName	HireDate	DeptName
Debora	Poe	2001-01-19 00:00:00	Finance
Wendy	Kahn	2001-01-26 00:00:00	Finance
…	…	…	…

Problem 7. Employees with Project

Write a query that selects:

- **EmployeeID**
- **FirstName**
- **ProjectName**

Filter only **employees with** a **project** which has **started after 13.08.2002** and it is still **ongoing** (no end date). Return the **first 5** rows **sorted** by **EmployeeID** in **ascending** order.

Example

EmployeeID	FirstName	ProjectName
1	Guy	Racing Socks
1	Guy	Road Bottle Cage
…	…	…

Problem 8. Employee 24

Write a query that selects:

- **EmployeeID**
- **FirstName**
- **ProjectName**

Filter all the **projects** of **employee** with **Id 24**. If the project has **started during or after 2005** the **returned** value should be **NULL**.

Example

EmployeeID	FirstName	ProjectName
24	David	NULL
24	David	Road-650
…	…	…

Problem 9. Employee Manager

Write a query that selects:

- **EmployeeID**
- **FirstName**
- **ManagerID**
- **ManagerName**

Filter all **employees** with a **manager** who has **ID** equals to **3 or 7**. Return all the rows, **sorted** by **EmployeeID** in **ascending** order.

Example

EmployeeID	FirstName	ManagerID	ManagerName
4	Rob	3	Roberto
9	Gail	3	Roberto
…	…	…	…

Problem 10. Employee Summary

Write a query that selects:

- **EmployeeID**
- **EmployeeName**
- **ManagerName**
- **DepartmentName**

Show **first 50 employees** with their **managers** and the **departments** they are in (show the departments of the employees). **Order** by **EmployeeID**.

Example

EmployeeID	EmployeeName	ManagerName	DepartmentName
1	Guy Gilbert	Jo Brown	Production
2	Kevin Brown	David Bradley	Marketing
3	Roberto Tamburello	Terri Duffy	Engineering
…	…	…	…

Problem 11. Min Average Salary

Write a query that **returns** the value of the **lowest average salary** of all **departments**.

Example:

MinAverageSalary
10866.6666

Problem 12. Highest Peaks in Bulgaria

Write a query that selects:

- **CountryCode**
- **MountainRange**
- **PeakName**
- **Elevation**

Filter all **peaks** in **Bulgaria** with **elevation over 2835**. **Return** all the rows **sorted** by **elevation** in **descending** order.

Example

CountryCode	MountainRange	PeakName	Elevation
BG	Rila	Musala	2925
BG	Pirin	Vihren	2914
…	…	…	…

Problem 13. Count Mountain Ranges

Write a query that selects:

- **CountryCode**
- **MountainRanges**

Filter the **count** of the **mountain ranges** in the **United States**, **Russia** and **Bulgaria**.

Example

CountryCode	MountainRanges
BG	6
RU	1
…	…

Problem 14. Countries with Rivers

Write a query that selects:

- **CountryName**
- **RiverName**

Find the **first 5 countries** with or without **rivers** in **Africa**. **Sort** them by **CountryName** in **ascending** order.

Example

CountryName	RiverName
Algeria	Niger
Angola	Congo
Benin	Niger
Botswana	NULL
Burkina Faso	Niger

Problem 15. *Continents and Currencies

Write a query that selects:

- **ContinentCode**
- **CurrencyCode**
- **CurrencyUsage**

Find all **continents** and their **most used currency**. Filter any **currency** that is used in **only one country**. **Sort** your results by **ContinentCode**.

Example

ContinentCode	CurrencyCode	CurrencyUsage
AF	XOF	8
AS	AUD	2
AS	ILS	2
EU	EUR	26
NA	XCD	8
OC	USD	8

Problem 16. Countries without any Mountains

Write a query that selects **CountryCode.** Find all the **count** of all **countries,** which **don't have** a **mountain**.

Example

CountryCode
231

Problem 17. Highest Peak and Longest River by Country

For each country, find the elevation of **the highest peak** and **the length of the longest river**, **sorted** by the **highest peak elevation** (from highest to lowest), then by the **longest river length** (from longest to smallest), then by **country name** (alphabetically). Display **NULL** when no data is available in some of the columns. Limit only the **first 5** rows.

CountryName	HighestPeakElevation	LongestRiverLength
China	8848	6300
India	8848	3180
Nepal	8848	2948
Pakistan	8611	3180
Argentina	6962	4880

Problem 18. * Highest Peak Name and Elevation by Country

For each country, find the **name** and **elevation** of **the highest peak**, along with its **mountain**. When no peaks are available in some country, display elevation **0**, "**(no highest peak)**" as **peak name** and "**(no mountain)**" as **mountain name**. When **multiple peaks** in some country have the **same elevation**, display **all of them**. **Sort** the results by **country name alphabetically**, then by **highest peak name alphabetically**. Limit only the **first 5** rows.

Country	Highest Peak Name	Highest Peak Elevation	Mountain
Afghanistan	(no highest peak)	0	(no mountain)
…	…	…	…
Argentina	Aconcagua	6962	Andes
…	…	…	…
Bulgaria	Musala	2925	Rila
Burkina Faso	(no highest peak)	0	(no mountain)
…	…	…	…
United States	Mount McKinley	6194	Alaska Range