# Exercises: Built-in Functions

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

# Part I – Queries for SoftUni Database

## Find Names of All Employees by First Name

Write a SQL query to find **first** and **last names** of all employees whose **first name starts with** **“SA”.**

SELECT FirstName, LastName

FROM Employees

WHERE FirstName LIKE 'SA%'

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Sariya | Harnpadoungsataya |
| Sandra | Reategui Alayo |
| … | … |

## Find Names of All employees by Last Name

Write a SQL query to find **first** and **last names** of all employees whose **last name contains “ei”.**

SELECT FirstName, LastName

FROM Employees

WHERE LastName LIKE '%ei%'

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Kendall | Keil |
| Christian | Kleinerman |
| … | … |

## Find First Names of All Employees

Write a SQL query to find the **first names** of all employees in the **departments** with **ID 3 or 10** and whose **hire year** is **between 1995 and 2005 inclusive**.

SELECT FirstName

FROM Employees

WHERE DepartmentID IN(3,10) AND DATEPART(YEAR, HireDate) BETWEEN 1995 AND 2005

### Example

|  |
| --- |
| **FirstName** |
| Deborah |
| Wendy |
| Candy |
| … |

## Find All Employees Except Engineers

Write a SQL query to find the **first** and **last names** of all employees whose **job titles does not contain** “**engineer**”.

SELECT FirstName,

LastName

FROM Employees

WHERE JobTitle not like '%engineer%'

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Guy | Gilbert |
| Kevin | Brown |
| Rob | Walters |
| … | … |

## Find Towns with Name Length

Write a SQL query to find town names that are **5** or **6 symbols long** and **order** them **alphabetically by town name**.

select Name

from Towns

where LEN(Name) in (5,6)

order by Name

### Example

|  |
| --- |
| **Name** |
| Berlin |
| Duluth |
| Duvall |
| … |

## Find Towns Starting With

Write a SQL query to find all towns that **start with** letters **M**, **K**, **B** or **E**. Order them **alphabetically** by town name.

select TownID, [Name]

from Towns

where Name like 'b%' or Name like 'k%' or Name like 'm%' or Name like 'e%'

order by Name

### Example

|  |  |
| --- | --- |
| **TownID** | **Name** |
| 5 | Bellevue |
| 31 | Berlin |
| 30 | Bordeaux |
| … | … |

## Find Towns Not Starting With

Write a SQL query to find all towns that **does not start with** letters **R**, **B** or **D**. Order them **alphabetically** by name.

select TownID, [Name]

from Towns

where left(Name, 1) not like '[RBd]'

order by Name

### Example

|  |  |
| --- | --- |
| **TownID** | **Name** |
| 2 | Calgary |
| 23 | Cambridge |
| 15 | Carnation |
| … | … |

## Create View Employees Hired After 2000 Year

Write a SQL query to create view **V\_EmployeesHiredAfter2000** with **first and last name** to all employees **hired after 2000 year.**

CREATE VIEW V\_EmployeesHiredAfter2000

AS

SELECT FirstName,

LastName

FROM Employees

WHERE DATEPART(YEAR, HireDate) > 2000

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Steven | Selikoff |
| Peter | Krebs |
| Stuart | Munson |
| ... | ... |

## Length of Last Name

Write a SQL query to find the **names of all employees** whose **last name** is **exactly** **5 characters long.**

SELECT FirstName,

LastName

FROM Employees

WHERE LEN(LASTNAME) = 5

### Example

|  |  |
| --- | --- |
| **FirstName** | **LastName** |
| Kevin | Brown |
| Terri | Duffy |
| Jo | Brown |
| Diane | Glimp |
| … | … |

# Part II – Queries for Geography Database

## Countries Holding ‘A’ 3 or More Times

Find all countries that holds the letter 'A' in their name at least 3 times (case insensitively), sorted by ISO code. Display the country name and ISO code.

SELECT CountryName,

IsoCode AS [ISO Code]

FROM Countries

WHERE CountryName LIKE '%a%a%a%'

ORDER BY IsoCode

### Example

|  |  |
| --- | --- |
| **Country Name** | **ISO Code** |
| Afghanistan | AFG |
| Albania | ALB |
| … | … |

## Mix of Peak and River Names

Combine all peak names with all river names, so that the **last letter** of each **peak name** is the **same** **as** the **first letter** of its corresponding **river** **name**. Display the peak names, river names, and the obtained mix (mix should be in lowercase). **Sort** the results **by** the **obtained mix**.

### Example

|  |  |  |
| --- | --- | --- |
| **PeakName** | **RiverName** | **Mix** |
| Aconcagua | Amazon | aconcaguamazon |
| Aconcagua | Amur | aconcaguamur |
| Banski Suhodol | Lena | banski suhodolena |
| … | … | … |

# Part III – Queries for Diablo Database

## Games from 2011 and 2012 year

Find the top 50 games ordered by start date, then by name of the game. Display only games from 2011 and 2012 year. Display start date in the format “**yyyy-MM-dd**”.

SELECT TOP(50)

Name,

FORMAT(CAST(START AS DATE), 'yyyy-MM-dd') AS [Start]

FROM Games

WHERE DATEPART(YEAR, Start) BETWEEN 2011 AND 2012

ORDER BY Start,

Name

### Example

|  |  |
| --- | --- |
| **Name** | **Start** |
| Rose Royalty | 2011-01-05 |
| London | 2011-01-13 |
| Broadway | 2011-01-16 |
| … | … |

## User Email Providers

Find all users along with information about their email providers. Display the username and email provider. Sort the results by email provider alphabetically, then by username.

SELECT Username,

RIGHT(Email, LEN(Email)-CHARINDEX('@', Email)) AS [Email Provider]

FROM Users

ORDER BY [Email Provider],

Username

### Example

|  |  |
| --- | --- |
| **Username** | **Email Provider** |
| Pesho | abv.bg |
| monoxidecos | astonrasuna.com |
| bashsassafras | balibless |
| … | … |

## Get Users with IPAdress Like Pattern

Find all users along with their IP addresses sorted by username alphabetically. Display only rows that IP address matches the pattern: “**\*\*\*.1^.^.\*\*\***”.

SELECT Username,

IpAddress AS [Ip Address]

FROM Users

WHERE IpAddress LIKE '\_\_\_.1%.%.\_\_\_'

ORDER BY Username

Legend: **\*** - one symbol, **^** - one or more symbols

### Example

|  |  |
| --- | --- |
| **Username** | **IP Address** |
| Bindbawdy | 192.157.20.222 |
| evolvingimportant | 223.175.227.173 |
| Inguinalself | 255.111.250.207 |
| … | … |

## Show All Games with Duration and Part of the Day

Find all games with part of the day and duration sorted by game name alphabetically then by duration (alphabetically, not by the timespan) and part of the day (all ascending). **Parts of the day** should be **Morning** (time is >= 0 and < 12), **Afternoon** (time is >= 12 and < 18), **Evening** (time is >= 18 and < 24). **Duration** should be **Extra** **Short** (smaller or equal to 3), **Short** (between 4 and 6 including), **Long** (greater than 6) and **Extra Long** (without duration).

SELECT Name AS [Game],

CASE

WHEN DATEPART(HOUR, Start) BETWEEN 0 AND 11

THEN 'Morning'

WHEN DATEPART(HOUR, Start) BETWEEN 12 AND 17

THEN 'Afternoon'

WHEN DATEPART(HOUR, Start) BETWEEN 18 AND 24

THEN 'Evening'

ELSE 'N/A'

END AS [Part of the Day],

CASE

WHEN Duration<=3

THEN 'Extra Short'

WHEN Duration BETWEEN 4 AND 6

THEN 'Short'

WHEN Duration>6

THEN 'Long'

WHEN Duration IS NULL

THEN 'Extra Long'

ELSE 'Error - must be unreachable case'

END AS [Duration]

FROM Games

ORDER BY [Game],

[Duration],

[Part of the Day]

### Example

|  |  |  |
| --- | --- | --- |
| **Game** | **Part of the Day** | **Duration** |
| Ablajeck | Morning | Long |
| Ablajeck | Afternoon | Short |
| Abregado Rae | Afternoon | Long |
| Abrion | Morning | Extra Short |
| Acaeria | Evening | Long |
| … | … | … |

# Part IV – Date Functions Queries

## Orders Table

You are given a table **Orders(Id, ProductName, OrderDate)** filled with data. Consider that the **payment** for that order must be accomplished **within 3 days after the order date**. Also the **delivery date is up to 1 month**. Write a query to show each product’s **name**, **order date**, **pay and deliver due dates**.

SELECT ProductName,

OrderDate,

DATEADD(DAY, 3, OrderDate) AS [Pay Due],

DATEADD(MONTH, 1, OrderDate) AS [Deliver Due]

FROM Orders

### Original Table

|  |  |  |
| --- | --- | --- |
| **Id** | **ProductName** | **OrderDate** |
| 1 | Butter | 2016-09-19 00:00:00.000 |
| 2 | Milk | 2016-09-30 00:00:00.000 |
| 3 | Cheese | 2016-09-04 00:00:00.000 |
| 4 | Bread | 2015-12-20 00:00:00.000 |
| 5 | Tomatoes | 2015-12-30 00:00:00.000 |
| … | … | … |

### Output

|  |  |  |  |
| --- | --- | --- | --- |
| **ProductName** | **OrderDate** | **Pay Due** | **Deliver Due** |
| Butter | 2016-09-19 00:00:00.000 | 2016-09-22 00:00:00.000 | 2016-10-19 00:00:00.000 |
| Milk | 2016-09-30 00:00:00.000 | 2016-10-03 00:00:00.000 | 2016-10-30 00:00:00.000 |
| Cheese | 2016-09-04 00:00:00.000 | 2016-09-07 00:00:00.000 | 2016-10-04 00:00:00.000 |
| Bread | 2015-12-20 00:00:00.000 | 2015-12-23 00:00:00.000 | 2016-01-20 00:00:00.000 |
| Tomatoes | 2015-12-30 00:00:00.000 | 2016-01-02 00:00:00.000 | 2016-01-30 00:00:00.000 |
| … | … | … | … |

## People Table

Create a table **People(Id, Name, Birthdate).** Write a query to **find** **age in years**, **months**, **days** and **minutes** for each person for the **current time** of executing the query.

### Original Table

|  |  |  |
| --- | --- | --- |
| **Id** | **Name** | **Birthdate** |
| 1 | Victor | 2000-12-07 00:00:00.000 |
| 2 | Steven | 1992-09-10 00:00:00.000 |
| 3 | Stephen | 1910-09-19 00:00:00.000 |
| 4 | John | 2010-01-06 00:00:00.000 |
| … | … | … |

### Example Output

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Name** | **Age in Years** | **Age in Months** | **Age in Days** | **Age in Minutes** |
| Victor | 16 | 189 | 5754 | 8286787 |
| Steven | 24 | 288 | 8764 | 12621187 |
| Stephen | 106 | 1272 | 38706 | 55737667 |
| John | 6 | 80 | 2437 | 3510307 |
| … | … | … | … | … |