# Exercises: Built-in Functions

This document defines the **exercise** assignments for the ["Databases Basics - MSSQL" course @ Software University](https://softuni.bg/trainings/4182/ms-sql-september-2023).   
You can check your solutions in the [Judge system](https://judge.softuni.org/Contests/290/Built-in-Functions).

# Part I – Queries for SoftUni Database

## Find Names of All Employees by First Name

Create a SQL query that finds all employees whose **first name starts with** "**Sa**"**. As a result, display "FirstName" and "LastName".**

### Example

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

## Find Names of All Employees by Last Name

Create a SQL query that finds all employees whose last **name contains**"**ei**"**. As a result, display "FirstName" and "LastName".**

### Example

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

## Find First Names of All Employees

Create a SQL query that finds the **first names** of all employees whose **department** **ID is 3 or 10,** and **the hire year** is **between 1995 and 2005 inclusive**.

### Example

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

## Find All Employees Except Engineers

Create a SQL query that finds the **first**and**last names** of every employee, whose **job title does not contain** "**engineer**".

### Example

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

## Find Towns with Name Length

Create a SQL query that finds all town names, which are **5** or **6 symbols long.** **Order** the result **alphabetically by town name**.

### Example

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

## Find Towns Starting With

Create a SQL query that finds all towns with names **starting with 'M'**, **'K'**, **'B'** or **'E'**. Order the result **alphabetically** **by town name.**

### Example

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

## Find Towns Not Starting With

Create a SQL query that finds all towns, which **do not start with 'R'**, **'B'** or **'D'**. Order the result **alphabetically by name**.

### Example

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

## Create View Employees Hired After 2000 Year

Create a SQL query that creates view "**V\_EmployeesHiredAfter2000"** with **the first and the last name** for all employees, **hired after the year 2000.**

### Example

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

## Length of Last Name

Create a SQL query that finds **all employees,** whose **last name** is **exactly** **5 characters long.**

### Example

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

## Rank Employees by Salary

Write a query that **ranks** all employees using **DENSE\_RANK**. In the **DENSE\_RANK** function, employees need to be **partitioned** by **Salary** and **ordered** by **EmployeeID**. You need to find **only** the employees, whose **Salary** is between **10000** and **50000** and **order** them by **Salary** in **descending** **order**.

### Example

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EmployeeID** | **FirstName** | **LastName** | **Salary** | **Rank** |
| 268 | Stephen | Jiang | 48100.00 | 1 |
| 284 | Amy | Alberts | 48100.00 | 2 |
| 288 | Syed | Abbas | 48100.00 | 3 |
| … | … | … | … | … |

## Find All Employees with Rank 2

Upgrade the query from the previous problem, so that it finds only the employees with **a Rank** **2**. **Order** the result **by Salary (descending)**.

### Example

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **EmployeeID** | **FirstName** | **LastName** | **Salary** | **Rank** |
| 284 | Amy | Alberts | 48100.00 | 2 |
| 292 | Martin | Kulov | 48000.00 | 2 |
| 71 | Wendy | Kahn | 43300.00 | 2 |
| … | … | … | … | … |

# Part II – Queries for Geography Database

## Countries Holding 'A' 3 or More Times

Find all countries which hold the letter '**A**' at least 3 times in their name (case-insensitively). **Sort** the **result by ISO code** and display the "**Country Name"** and "**ISO Code"**.

### 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 and display the **top 50 games** which start date is from **2011** and **2012** year. **Order** them by start date, **then by name of the game**. The start date should be in the following format: "**yyyy-MM-dd**".

### Example

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

## User Email Providers

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

### Example

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

## Get Users with IP Address Like Pattern

Find all **users** with their **IP addresses**, **sorted** **by** **username alphabetically**. Display only the rows which IP address matches the pattern: "**\*\*\*.1^.^.\*\*\***".

**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.** **Sort** them **by game name** alphabetically, **then by duration** (alphabetically, not by the timespan) and **part of the day** (all ascending). **Part 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).

### 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**.

### 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 |
| … | … | … | … | … |