

# Exercises: Built-in Functions

This document defines the **exercise assignments** for the ["Databases Basics - MSSQL" course @ Software University](#).

## Part I – Queries for SoftUni Database

### Problem 1. 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"**.

#### Example

FirstName	LastName
Sariya	Harnpadoungsataya
Sandra	Reategui Alayo
...	...

### Problem 2. 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"**.

#### Example

FirstName	LastName
Kendall	Keil
Christian	Kleinerman
...	...

### Problem 3. 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**.

#### Example

FirstName
Deborah
Wendy
Candy
...

### Problem 4. 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"**.

#### Example

FirstName	LastName
Guy	Gilbert
Kevin	Brown
Rob	Walters
...	...

## Problem 5. 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**.

### Example

Name
Berlin
Duluth
Duvall
...

## Problem 6. 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.

### Example

TownID	Name
5	Bellevue
31	Berlin
30	Bordeaux
...	...

## Problem 7. 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.

### Example

TownID	Name
2	Calgary
23	Cambridge
15	Carnation
...	...

## Problem 8. 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**.

### Example

FirstName	LastName
Steven	Selikoff
Peter	Krebs
Stuart	Munson
...	...

## Problem 9. Length of Last Name

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

### Example

FirstName	LastName
Kevin	Brown

Terri	Duffy
Jo	Brown
Diane	Glimp
...	...

## Problem 10.

### 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
...	...	...	...	...

## Problem 11. Find All Employees with Rank 2 \*

Use the query from the **previous** problem and **upgrade** it, so that it finds **only** the employees whose **Rank** is 2 and again, **order** them 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

### Problem 12. 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.

#### Example

Country Name	ISO Code
Afghanistan	AFG
Albania	ALB
...	...

### Problem 13. 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

### Problem 14. 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

#### Example

Name	Start
Rose Royalty	2011-01-05
London	2011-01-13
Broadway	2011-01-16
...	...

### Problem 15. 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.

#### Example

Username	Email Provider
Pesho	abv.bg
monoxidecos	astonrasuna.com
bashsassafras	balibless
...	...

### Problem 16. 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^.^.*`.

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
...	...

## Problem 17. 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  $\geq 0$  and  $< 12$ ), **Afternoon** (time is  $\geq 12$  and  $< 18$ ), **Evening** (time is  $\geq 18$  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
Ablajack	Morning	Long
Ablajack	Afternoon	Short
Abregado Rae	Afternoon	Long
Abrion	Morning	Extra Short
Acaeria	Evening	Long
...	...	...

## Part IV – Date Functions Queries

### Problem 18. 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
...	...	...	...

### Problem 19. 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
...	...	...	...	...