**Exercises: Functions and Stored Procedures**

This document defines the **exercise** assignments for the ["Databases Basics - MSSQL" course @ Software University](https://softuni.bg/trainings/3965/ms-sql-january-2023).   
You can check your solutions in the [Judge system](https://judge.softuni.org/Contests/1025/Functions-and-Stored-Procedures).

**Part I – Queries for SoftUni Database**

* **Employees with Salary Above 35000**

Create storedprocedure **usp\_GetEmployeesSalaryAbove35000** that returns **all employees' first and last names**, whose **salary above 35000**.

**Example**

|  |  |
| --- | --- |
| **First Name** | **Last Name** |
| Roberto | Tamburello |
| David | Bradley |
| Terri | Duffy |
| … | … |

* **Employees with Salary Above Number**

Create a stored procedure **usp\_GetEmployeesSalaryAboveNumber** that **accepts a number** (of type **DECIMAL(18,4)**) as parameter and returns **all employees' first and last names,** whose salary is **above or equal** to the given number.

**Example**

Supplied number for that example is 48100.

|  |  |
| --- | --- |
| **First Name** | **Last Name** |
| Terri | Duffy |
| Jean | Trenary |
| Ken | Sanchez |
| … | … |

* **Town Names Starting With**

Create a stored procedure **usp\_GetTownsStartingWith** that **accepts a string as parameter** and returns **all town names starting with that string.**

**Example**

Here is the list of all towns **starting with "b".**

|  |
| --- |
| **Town** |
| Bellevue |
| Bothell |
| Bordeaux |
| Berlin |

* **Employees from Town**

Create a stored procedure **usp\_GetEmployeesFromTown** that accepts **town name** as parameter and returns the **first and last name** of those employees**, who live in the given town.**

**Example**

Here it is a list of employees, **living in Sofia.**

|  |  |
| --- | --- |
| **First Name** | **Last Name** |
| Svetlin | Nakov |
| Martin | Kulov |
| George | Denchev |

* **Salary Level Function**

Create a function **ufn\_GetSalaryLevel(@salary DECIMAL(18,4))** that receives **salary of an employee** and returns the **level of the salary**.

* If salary is **< 30000**, return **"Low"**
* If salary is **between 30000 and 50000 (inclusive)**, return **"Average"**
* If salary is **> 50000,** return **"High"**

**Example**

|  |  |
| --- | --- |
| **Salary** | **Salary Level** |
| 13500.00 | Low |
| 43300.00 | Average |
| 125500.00 | High |

* **Employees by Salary Level**

Create a stored procedure **usp\_EmployeesBySalaryLevel** that receives as parameter **level of salary** (low, average, or high) and print the **names of all employees,** who have the given level of salary. You should use the function - "**dbo.ufn\_GetSalaryLevel(@Salary)**", which was part of the previous task, inside your "**CREATE PROCEDURE …**" query.

**Example**

Here is the list of all employees with a high salary.

|  |  |
| --- | --- |
| **First Name** | **Last Name** |
| Terri | Duffy |
| Jean | Trenary |
| Ken | Sanchez |
| … | … |

* **Define Function**

Define a function **ufn\_IsWordComprised(@setOfLetters, @word)** that returns **true** or **false,** depending on that if the word is comprised of the given set of letters.

**Example**

|  |  |  |
| --- | --- | --- |
| **SetOfLetters** | **Word** | **Result** |
| oistmiahf | Sofia | 1 |
| oistmiahf | halves | 0 |
| bobr | Rob | 1 |
| pppp | Guy | 0 |

* **Delete Employees and Departments**

Create a **procedure** with the name **usp\_DeleteEmployeesFromDepartment (@departmentId** INT**) which deletes all Employees** from a **given** **department**. **Delete these departments** from the **Departments table** too. **Finally, SELECT** the **number** of **employees** from the **given department**. If the delete statements are correct the select query should return 0.

After completing that exercise restore your database to revert all changes.

**Hint:**

You may set **ManagerID** column in **Departments** table to **nullable** (using query "**ALTER TABLE …**").

**Part II – Queries for Bank Database**

* **Find Full Name**

You are given a database schema with tables **AccountHolders(Id (PK), FirstName, LastName, SSN)** and **Accounts(Id (PK), AccountHolderId (FK), Balance)**. Write a stored procedure **usp\_GetHoldersFullName** that selects the full name of all people.

**Example**

|  |
| --- |
| **Full Name** |
| Susan Cane |
| Kim Novac |
| Jimmy Henderson |
| … |

* **People with Balance Higher Than**

Your task is to create a stored procedure **usp\_GetHoldersWithBalanceHigherThan** that accepts a **number as a parameter** and returns all the **people, who have more money in total in all their accounts than the supplied number**. **Order** them by their **first name**, then by their **last name**.

**Example**

|  |  |
| --- | --- |
| **First Name** | **Last Name** |
| Monika | Miteva |
| Petar | Kirilov |
| … | … |

* **Future Value Function**

Your task is to create a function **ufn\_CalculateFutureValue** that accepts as parameters – **sum (decimal)**, **yearly interest rate (float)**, and **the number of years (int)**. It should calculate and return the future value of the initial sum rounded up to the **fourth digit** after the decimal delimiter. Use the following formula:

𝐹𝑉=𝐼×((1+𝑅)𝑇)

* **I** – Initial sum
* **R** – Yearly interest rate
* **T** – Number of years

**Example**

|  |  |
| --- | --- |
| **Input** | **Output** |
| **Initial sum:** 1000  **Yearly Interest rate:** 10%  **years:** 5  ufn\_CalculateFutureValue(1000, 0.1, 5) | 1610.5100 |

* **Calculating Interest**

Your task is to create a stored procedure **usp\_CalculateFutureValueForAccount** that uses the function from the previous problem to give an interest to a person's account **for 5 years**, along with information about their **account id, first name, last name and current balance** as it is shown in the example below. It should take the **AccountId** and the **interest rate** as parameters. Again, you are provided with the **dbo.ufn\_CalculateFutureValue** function, which was part of the previous task.

**Example**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Account Id** | **First Name** | **Last Name** | **Current Balance** | **Balance in 5 years** |
| 1 | Susan | Cane | 123.12 | 198.2860 |

\*Note: for the example above interest rate is 0.1

**Part III – Queries for Diablo Database**

*You are given a****database "Diablo"****holding users, games, items, characters and statistics, available as an SQL script. Your task is to write some stored procedures, views, and other server-side database objects and write some SQL queries for displaying the data from the database.*

***Important:****start with a****clean copy of the "Diablo" database******on each problem****. Just execute the SQL script again.*

* **\*Scalar Function: Cash in User Games Odd Rows**

Create a **function** **ufn\_CashInUsersGames** that **sums the cash of the odd rows**. Rows must be ordered by cash in descending order. The function should take a **game name** as a **parameter** and **return the result as a table**. Submit **only your function** **in**.

Execute the function over the following game names, ordered exactly like: "**Love in a mist**".

**Output**

|  |
| --- |
| **SumCash** |
| 8585.00 |

**Hint**

Use **ROW\_NUMBER** to get the rankings of all rows based on order criteria.