

# Exercises: Database Programmability and Transactions

This document defines the **exercise assignments** for the [MySQL course @ Software University](#).

## Part I – Queries for SoftUni Database

### 1. Employees with Salary Above 35000

Create stored procedure **usp\_get\_employees\_salary\_above\_35000** that returns all employees' first and last names for whose **salary** is above 35000. The result should be sorted by **first\_name** then by **last\_name** alphabetically, and **id ascending**. Submit your query statement as Run skeleton, run queries & check DB in Judge.

#### Example

first_name	last_name
Amy	Alberts
Brian	Welcker
Dan	Wilson
...	...

### 2. Employees with Salary Above Number

Create stored procedure **usp\_get\_employees\_salary\_above** that **accept a decimal number** (with precision, **4 digits** after the decimal point) as parameter and return **all employee's first and last names** whose salary is **above or equal** to the given number. The result should be sorted by **first\_name** then by **last\_name** alphabetically and **id ascending**. Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

#### Example

Supplied number for that example is 45000.

first_name	last_name
Amy	Alberts
Brian	Welcker
Dylan	Miller
...	...

### 3. Town Names Starting With

Write a stored procedure **usp\_get\_towns\_starting\_with** that **accept string as parameter** and returns **all town names starting with that string**. The result should be sorted by **town\_name** alphabetically. Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

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

town_name
Bellevue
Berlin
Bordeaux
Bothell

## 4. Employees from Town

Write a stored procedure **usp\_get\_employees\_from\_town** that accepts **town\_name** as parameter and return the **employees' first and last name that live in the given town**. The result should be sorted by **first\_name** then by **last\_name** alphabetically and **id ascending**. Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

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

first_name	last_name
George	Denchev
Martin	Kulov
Svetlin	Nakov

## 5. Salary Level Function

Write a function **ufn\_get\_salary\_level** 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"**

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

salary	salary_Level
13500.00	Low
43300.00	Average
125500.00	High

## 6. Employees by Salary Level

Write a stored procedure **usp\_get\_employees\_by\_salary\_level** that receive as **parameter level of salary** (low, average or high) and print the **names of all employees** that have given level of salary. The result should be sorted by **first\_name** then by **last\_name** both in **descending order**.

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

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

first_name	last_name
Terri	Duffy
Laura	Norman
Ken	Sanchez
...	...

## 7. Define Function

Define a function `ufn_is_word_comprised(set_of_letters varchar(50), word varchar(50))` that returns **1** or **0** depending on that if the word is comprised of the given set of letters.

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

set_of_letters	word	result
oistmiahf	Sofia	1
oistmiahf	halves	0
bobr	Rob	1
pppp	Guy	0

# PART II – Queries for Bank Database

## 8. Find Full Name

You are given a database schema with tables:

- `account_holders(id (PK), first_name, last_name, ssn)`
- and
- `accounts(id (PK), account_holder_id (FK), balance).`

Write a stored procedure `usp_get_holders_full_name` that selects the full names of all people. The result should be sorted by **full\_name** alphabetically and **id ascending**. Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

full_name
Bjorn Sweden
Jimmy Henderson
Kim Novac
...

## 9. People with Balance Higher Than

Your task is to create a stored procedure **usp\_get\_holders\_with\_balance\_higher\_than** that accepts a **number as a parameter** and returns all **people who have more money in total of all their accounts than the supplied number**. The result should be sorted by **account\_holders.id** ascending.

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

### Example

Supplied number for that example is 7000.

first_name	last_name
Susan	Cane
Petar	Kirilov
Zlatina	Pateva
...	...

## 10. Future Value Function

Your task is to create a function **ufn\_calculate\_future\_value** that accepts as parameters – **sum** (with precision, **4 digits** after the decimal point), **yearly interest rate (double)** and **number of years(int)**. It should calculate and return the **future value of the initial sum**. The result from the function **must** be **decimal, with percision 4**.

Using the following formula:

$$FV = I \times ((1 + R)^T)$$

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

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

### Example

Input	Output
Initial sum: 1000 Yearly Interest rate: 50% years: 5 ufn_calculate_future_value(1000, 0.5, 5)	7593.7500

## 11. Calculating Interest

Your task is to create a stored procedure **usp\_calculate\_future\_value\_for\_account** that accepts as parameters – **id** of account and **interest** rate. The procedure uses the function from the previous problem to give an interest to a person's account **for 5 years**, along with information about his/her **account id, first name, last name and current balance** as it is shown in the example below. It should take the **account\_id** and the **interest\_rate** as parameters. Interest rate should have precision up to 0.0001, same as the calculated balance after 5 years. **Be extremely careful to achieve the desired precision!**

Submit your query statement as **Run skeleton, run queries & check DB in Judge.**

## Example

Here is the result for **account\_id = 1** and **interest\_rate = 0.1**.

account_id	first_name	last_name	current_balance	balance_in_5_years
1	Susan	Cane	123.1200	198.2860

## 12. Deposit Money

Add stored procedure **usp\_deposit\_money(account\_id, money\_amount)** that operate in transactions.

Make sure to guarantee valid positive **money\_amount** with precision up to **fourth sign after decimal point**. The procedure should produce exact results working with the specified precision.

Submit your query statement as **Run skeleton, run queries & check DB in Judge.**

## Example

Here is the result for **account\_id = 1** and **money\_amount = 10**.

account_id	account_holder_id	balance
1	1	133.1200

## 13. Withdraw Money

Add stored procedures **usp\_withdraw\_money(account\_id, money\_amount)** that operate in transactions.

Make sure to guarantee withdraw is done only when balance is enough and **money\_amount** is valid positive number. **Work with precision up to fourth sign after decimal point**. The procedure should produce exact results working with the specified precision.

Submit your query statement as **Run skeleton, run queries & check DB in Judge.**

## Example

Here is the result for **account\_id = 1** and **money\_amount = 10**.

account_id	account_holder_id	balance
1	1	123.1200

## 14. Money Transfer

Write stored procedure **usp\_transfer\_money(from\_account\_id, to\_account\_id, amount)** that **transfers money from one account to another**. Consider cases when one of the **account\_ids** is not valid, the amount of **money is negative number**, **outgoing balance** is enough or transferring **from/to one and the same account**. Make sure that the whole procedure **passes without errors** and **if error occurs make no change in the database**.

Make sure to guarantee exact results working with precision up to fourth sign after decimal point.

Submit your query statement as **Run skeleton, run queries & check DB in Judge.**

## Example

Here is the result for **from\_account\_id = 1**, **to\_account\_id = 2** and **money\_amount = 10**.

account_id	account_holder_id	balance
1	1	113.1200
2	3	4364.2300

## 15. Log Accounts Trigger

Create another table – **logs(log\_id, account\_id, old\_sum, new\_sum)**. Add a **trigger** to the **accounts** table that enters a new entry into the **logs** table every time the sum on an **account** changes.

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

The following data in logs table is inserted after updating balance of account with **account\_id = 1** with 10.

log_id	account_id	old_sum	new_sum
1	1	123.12	113.12
2	1	145.43	155.43

## 16. Emails Trigger

Create another table – **notification\_emails(id, recipient, subject, body)**. Add a trigger to logs table to **create new email whenever new record is inserted in logs table**. The following data is required to be filled for each email:

- **recipient** – **account\_id**
- **subject** – "Balance change for account: {account\_id}"
- **body** - "On {date (current date)} your balance was changed from {old} to {new}."

Submit your query statement as **Run skeleton, run queries & check DB in Judge**.

## Example

id	recipient	subject	body
1	1	Balance change for account: 1	On Sep 15 2016 at 11:44:06 AM your balance was changed from 133 to 143.
...	...	...	...