# Exercises: Entity Framework

This document defines the **exercise assignments** for the ["Databases Advanced – Entity Framework" course @ Software University.](https://softuni.bg/trainings/1442/databases-advanced-entity-framework-october-2016)

## Bank System

Your task is to create a database for **Bank System,** using the **Entity Framework Code First** approach. In the database, we should keep information about banking accounts. There are two types of bank accounts:

* **Saving account** – account number, balance, interest rate
* **Checking account** – account number, balance, fee

The **operations** that can be performed with those accounts are:

* **Savings account** – deposit money, withdraw money, add interest
* **Checking account** – deposit money, withdraw money, deduct fee

## Bank System Console Client

Extend the database from the previous exercise to support keeping information about **users**. A user has **username, password, email** and can have **many bank accounts**. Design a console application that uses that database and support the following commands:

Commands that can be executed when there is **no currently logged in user**:

* Register <username> <password> <email> - That command add new user to the database in case username, password and email are valid. Otherwise print appropriate message informing why the user cannot be registered. The requirements for valid parameters are:
  + **Username** – can contain only letters [a-Z] and numbers. Cannot start with number. Cannot be less than 3 symbols long
  + **Password** – must contain at least 1 lowercase letter, 1 uppercase letter and 1 digit. Also, must be more than 6 symbols long
  + **Email** – must be in format **<user>@<host>** where:
    - **<user>** is a sequence of letters and digits, where '**.**', '**-**' and '**\_**' can appear between them.
    - **<host>** is a sequence of at least two words, separated by dots '**.**'. Each word is sequence of letters and can have hyphens '**-**' between the letters.
* Login <username> <password> - That command set the current logged in user if exists. Otherwise print appropriate message.

Commands that can be executed when there is **currently logged in user**:

* Logout – log out the user from the system. If there is no logged in user print appropriate message.
* AddSavingAccount <initial balance> <interest rate> - add saving account to the currently logged in user. Also, set the account number to random combination of 10 uppercase letters and digits. For example: “PX234ADG56”, “90M09JKE73”, etc.
* AddCheckingAccount <initial balance> <fee> - add checking account to the currently logged in user. Also, set the account number to random combination of 10 uppercase letters and digits.
* ListAccounts – prints a list of overall information for all accounts of currently logged in user in format:

Saving Accounts:

--{Account Number} {Current Balance}  
Checking Accounts:  
--{Account Number} {Current Balance}

Order them **by account number ascending**.

* Deposit <Account number> <money> - adds money to the account with given number
* Withdraw <Account number> <money> - subtracts money from the account with given number
* DeductFee <Account number> - deduct the fee from the balance of the account with given number
* AddInterest <Account number> - add interest to the balance of the account with given number

After each command **print appropriate message** telling whether the command was successfully executed or not. If it is not print appropriate message telling what was the error. Use all of the **best practices** in programming and **suitable** **design patterns**.

### Example

|  |  |
| --- | --- |
| **Input** | **Output** |
| Register vl Tsepesh89 vlad@rom.ro  Register vlad123 tspesh vlad@rom.ro  Register vlad123 Tsepesh89 -v-@-rom.ro  Register vlad123 Tsepesh89 vlad@rom.ro  Logout  Login vlad321 Tsepesh89  Login vlad123 smallPussyCat  Login vlad123 Tsepesh89  AddSavingsAccount 1000 0.2  AddCheckingAccount 100 4.20  Deposit A8234JDG9M 10.42  Withdraw A8234JDG9M 5  Deposit PO8FHH34GM 200  Withdraw PO8FHH34GM 45.2  AddInterest A8234JDG9M  DeductFee PO8FHH34GM  ListAccounts  Logout | Incorrect username  Incorrect password  Incorrect email  vlad123 was registered in the system  Cannot log out. No user was logged in.  Incorrect username / password  Incorrect username / password  Succesfully logged in vlad123  Succesfully added account with number A8234JDG9M  Succesfully added account with number PO8FHH34GM  Account A8234JDG9M has balance of 1010.42  Account A8234JDG9M has balance of 1005.42  Account PO8FHH34GM has balance of 300.00  Account PO8FHH34GM has balance of 254.80  Added interest to A8234JDG9M. Current balance: 1206.50  Deducted fee of PO8FHH34GM. Current balance: 250.60  Accounts for user vlad123  Saving Accounts:  --A8234JDG9M 1206.50  Checking Accounts:  --PO8FHH34GM 250.60  User vlad123 successfully logged out |