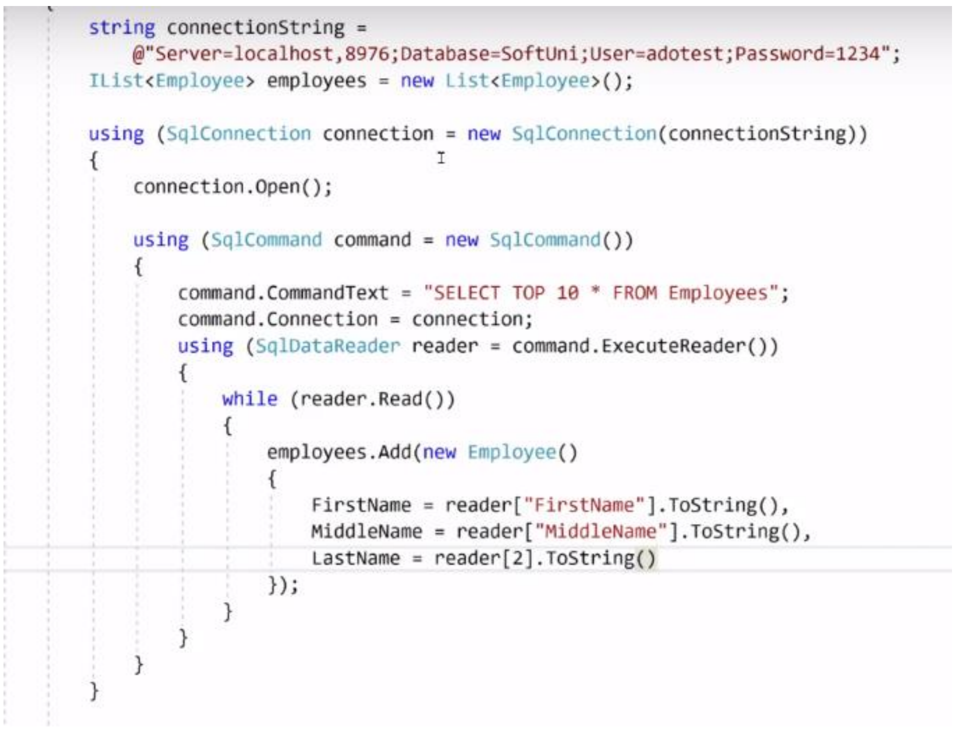
Exercises: Introduction to DB Apps

This document defines the **exercise assignments** for the ["Databases Advanced – EF Core" course @ Software University.]



```
string connectionString =
    @"Server=localhost,8976;Database=SoftUni;User=adotest;Password=1234";
IList<Employee> employees = new List<Employee>();

using (SqlConnection connection = new SqlConnection(connectionString))
{
    connection.Open();

    using (SqlCommand command = new SqlCommand())
    {
        command.CommandText = "SELECT TOP 10 * FROM Employees";
        command.Connection = connection;
        using (SqlDataReader reader = command.ExecuteReader())
        {
            while (reader.Read())
            {
                employees.Add(new Employee()
                {
                    FirstName = reader["FirstName"].ToString(),
                    MiddleName = reader["MiddleName"].ToString(),
                    LastName = reader[2].ToString()
                });
            }
        }
    }
}
```

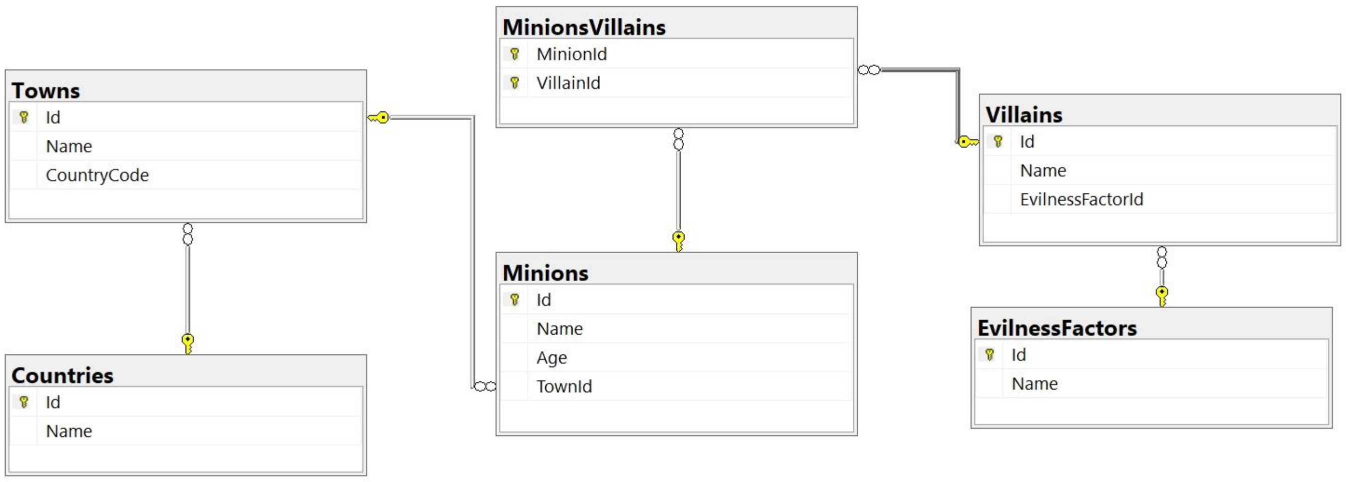
1. Initial Setup

Write a program that connects to your **localhost** server. Create **new database** called **MinionsDB** where we will keep information about our minions and villains.

For each **minion** we should keep information about its **name**, **age** and **town**. Each **town** has information about **the country** where it's located. **Villains** have **name** and **evilness factor** (**super good**, **good**, **bad**, **evil**, **super evil**). Each **minion** can **serve several villains** and **each villain** can **have several minions serving him**. Fill all tables with at least 5 records each.

In the end you shoud have the following tables:

- Countries
- Towns
- Minions
- EvilnessFactors
- Villains
- MinionsVillains



2. Villain Names

Write a program that prints on the console **all villains' names** and their **number of minions** of those who have more than 3 minions **ordered descending** by number of minions.

Example

Output
Gru - 6 Victor - 4 Jilly – 4

3. Minion Names

Write a program that prints on the console **all minion names** and age for a given **villain id**, ordered by **name alphabetically.**

If there is no villain with the given ID, print "No villain with ID <**VillainId**> exists in the database.".
If the selected villain has no minions, print "(no minions)" on the second row.

Example

Input	Output
1	Villain: Gru 1. Bob 13 2. Kevin 14 3. Steward 19

Input	Output
3	Villain: Victor 1. Bob 13 2. Simon 22

Input	Output
2	Villain: Victor Jr. (no minions)

Input	Output
10	No villain with ID 10 exists in the database.

4. Add Minion

Write a program that **reads information** about a minion and its villain and **adds it to the database**. In case the town of the minion is not in the database, **insert** it as well. In case the villain is not present in the database, add him too with a default **evilness factor** of "evil". Finally set the new minion to be a servant of the villain. Print appropriate messages after each operation.

Input

The input comes in two lines:

- On the first line, you will receive the **minion information** in the format "Minion: <**Name**> <**Age**> <**TownName**>"
- On the second – the **villain information** in the format "Villain: <**Name**>"

Output

After completing an operation, you must print one of the following messages:

- After adding a new **town** to the database: "Town <**TownName**> was added to the database."
- After adding a new **villain** to the database: "Villain <**VillainName**> was added to the database."
- Finally, after successfully adding the **minion** to the database and making it a **servant** of a villain: "Successfully added <**MinionName**> to be minion of <**VillainName**>."

***Bonus task:** Make sure all operations are executed successfully. In case of an error do not change the database.

Example

Input	Output

`Minion: Bob 14 Berlin`
`Villain: Gru`
	`Successfully added Robert to be minion of Gru.`

`Minion: Cathleen 20 Liverpool`
`Villain: Gru`
	`Town Liverpool was added to the database.`
	`Successfully added Cathleen to be minion of Gru.`

`Minion: Mars 23 Sofia`
`Villain: Poppy`
	`Villain Poppy was added to the database.`
	`Successfully added Mars to be minion of Poppy.`

`Minion: Carry 20 Eindhoven`
`Villain: Jimmy`
	`Town Eindhoven was added to the database.`
	`Villain Jimmy was added to the database.`
	`Successfully added Carry to be minion of Jimmy.`

5. Change Town Names Casing

Write a program that **changes all town names to uppercase** for a given country.

You will receive one line of input with the **name** of the country.

Print the number of towns that were changed in the format "<**ChangedTownsCount**> town names were affected.". On a second line, **print** the **names that were changed**, separated with a comma and a space.

If **no towns** were affected (the country does not exist in the database or has no cities connected to it), **print** "**No town names were affected.**".

Example

Input	Output

`Bulgaria`	`3 town names were affected.`
	`[SOFIA, VARNA, BURGAS]`

`Germany`	`No town names were affected.`

6. *Remove Villain

Write a program that receives the **ID** of a villain, **deletes him from the database** and **releases his minions** from serving to him. Print on **two lines** the name of the deleted villain in format "<**Name**> **was deleted**." and the number of minions released in format "<**MinionCount**> **minions were released**.". Make sure all operations go as planned, otherwise do not make any changes in the database.

If there is no villain in the database with the given ID, print "**No such villain was found**.".

Example

Input	Output
1	Gru was deleted. 6 minions were released.
3	Victor was deleted. 0 minions were released.
101	No such villain was found.

7. Print All Minion Names

Write a program that **prints all minion names** from the minions table **in the following order:** first record, last record, first + 1, last - 1, first + 2, last - 2 ... first + n, last - n.

1	10	2	9	3	8	4	7	5	6

Example

Original Order	Output
Bob Kevin Steward Jimmy Vicky Becky Jully	Bob Jully Kevin Becky Steward Vicky Jimmy

8. Increase Minion Age

Read from the console minion IDs separated by space. **Increment the age** of those minions **by 1** and make their **names title case**. Finally, **print the name and the age of all minions** in the database, each on a new row in format **"<Name> <Age>"**.

Example

Minions		
Id	**Name**	**Age**
1	bob	14
2	stuart	22
3	kevin	13
4	jimmy	49
5	vicky jackson	26

Input	Output

Input	Output

2 1 4	Bob 15 Stuart 23 kevin 13 Jimmy 50 vicky jackson 26		5	bob 14 stuart 22 kevin 13 jimmy 49 Vicky Jackson 27

9. Increase Age Stored Procedure

Create stored procedure **usp_GetOlder** (**directly in the database** using **Management Studio** or any other similar tool) that receives **MinionId** and **increases that minion's age by 1**. Write a program that **uses that stored procedure to increase the age** of a minion whose id will be given as input from the console. After that **print the name and the age** of that minion.

Example

Minions		
Id	**Name**	**Age**
1	bob	14
2	steward	22
3	kevin	13
4	jimmy	49
5	vicky jackson	26

Input	Output
1	bob – 15 years old
3	kevin – 14 years old
5	vicky jackson – 27 years old