Exercises: Advanced Querying

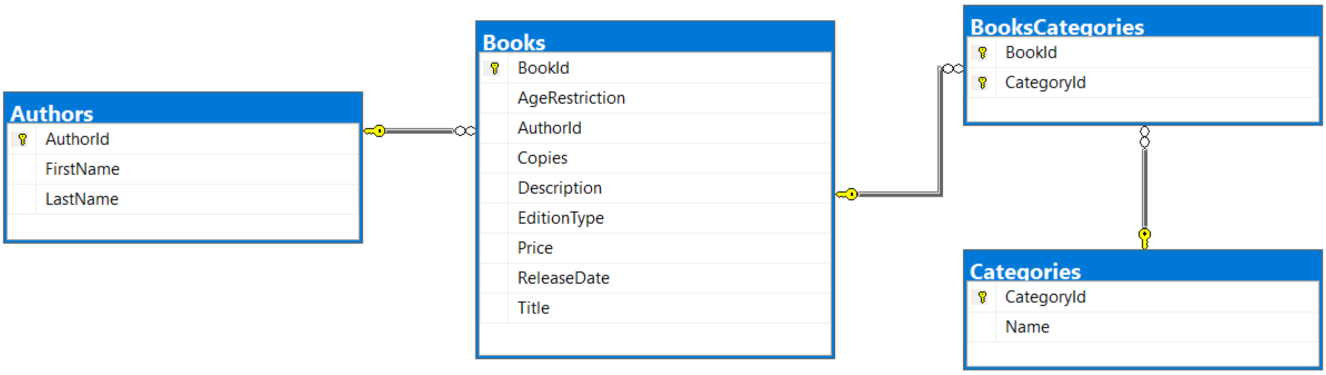
This document defines the **exercise assignments** for the "Databases Advanced – EF Core" course @ Software University.

BookShop System

For the following tasks, use the BookShop database. You can download the complete project or create it yourself in **task 0**, but you should still use the pre-defined **Seed()** method from the project to have the same **sample** data.

0. Book Shop Database

You must create a **database** for a **book shop system**. It should look like this:



Constraints

Your **namespaces** should be:

- **BookShop** – for your **StartUp** class
- **BookShop.Data** – for your DbContext
- **BookShop.Models** – for your models
- **BookShop.Models.Enums** – for your models

Your **models** should be:

- **BookShopContext** – your DbContext
- **Author**:
  - AuthorId
  - FirstName (up to 50 characters, unicode, not required)
  - LastName (up to 50 characters, unicode)
- **Book**:
  - BookId
  - Title (up to 50 characters, unicode)
  - Description (up to 1000 characters, unicode)
  - ReleaseDate (not required)
  - Copies (an integer)
  - Price
  - EditionType – enum (Normal, Promo, Gold)

    - AgeRestriction – enum (Minor, Teen, Adult)
    - Author
    - BookCategories
- **Category**:
    - CategoryId
    - Name (up to 50 characters, unicode)
    - CategoryBooks
- **BookCategory** – mapping class

For the following tasks, you will be creating methods that accept a BookShopContext as a parameter and use it to run some queries. Create those methods inside your **StartUp** class and upload your whole solution to **Judge**.

1. Age Restriction

NOTE: You will need method `public static string` **`GetBooksByAgeRestriction`**`(BookShopContext context, string command)` and `public StartUp` class.

Return in a **single string** all book **titles**, each on a **new line,** that have **age restriction**, equal to the **given command**. Order the titles **alphabetically**.

Read **input** from the console in your **main method**, and call your **method** with the **necessary arguments**. Print the **returned string** to the console. **Ignore** casing of the input.

Example

Input	Output
miNor	A Confederacy of Dunces A Farewell to Arms A Handful of Dust …
teEN	A Passage to India A Scanner Darkly A Swiftly Tilting Planet …

2. Golden Books

NOTE: You will need method `public static string` **`GetGoldenBooks`**`(BookShopContext context)` and `public StartUp` class.

Return in a **single** string **titles of the golden edition books** that have **less than 5000 copies**, each on a **new line**. Order them by **book id** ascending.

Call the **`GetGoldenBooks`**`(BookShopContext context)` method in your **`Main()`** and print the returned string to the console.

Example

Output
Lilies of the Field Look Homeward The Mirror Crack'd from Side to Side …

3. Books by Price

NOTE: You will need method `public static string` **`GetBooksByPrice`**`(BookShopContext context)` and `public StartUp` class.

Return in a single string all **titles and prices of books** with **price higher than 40**, each on a **new row** in the **format** given below. Order them by **price** descending.

Example

Output
O Pioneers! - $49.90 That Hideous Strength - $48.63 A Handful of Dust - $48.63 …

4. Not Released In

NOTE: You will need method `public static string` **`GetBooksNotReleasedIn`**`(BookShopContext context, int year)` and `public StartUp` class.

Return in a **single** string all **titles of books** that are **NOT released** on a given year. Order them by **book id** ascending.

Example

Input	Output
2000	Absalom Nectar in a Sieve Nine Coaches Waiting …
1998	The Needle's Eye No Country for Old Men No Highway …

5. Book Titles by Category

NOTE: You will need method `public static string` **`GetBooksByCategory`**`(BookShopContext context, string input)` and `public StartUp` class.

Return in a single string the **titles of books** by a given **list of categories**. The list of **categories** will be given in a single line separated with one or more spaces. Ignore casing. Order by **title** alphabetically.

Example

Input	Output
horror mystery drama	A Fanatic Heart A Farewell to Arms A Glass of Blessings …

6. Released Before Date

NOTE: You will need method `public static string` **`GetBooksReleasedBefore`**`(BookShopContext context, string date)` and `public StartUp` class.

Return **the title, edition type and price** of all books that are **released before a given date**. The date will be a string **in format dd-MM-yyyy**.

Return all of the rows in a **single** string, ordered by **release date descending**.

Example

Input	Output
12-04-1992	If I Forget Thee Jerusalem - Gold - $33.21 Oh! To be in England - Normal - $46.67 The Monkey's Raincoat - Normal - $46.93 …
30-12-1989	A Fanatic Heart - Normal - $9.41 The Curious Incident of the Dog in the Night-Time - Normal - $23.41 The Other Side of Silence - Gold - $46.26 …

7. Author Search

NOTE: You will need method public static string **GetAuthorNamesEndingIn**(BookShopContext context, string input) and public StartUp class.

Return the **full names** of **authors**, whose **first name** ends with a **given string**.

Return all **names** in a **single string**, each on a **new row**, ordered alphabetically.

Example

Input	Output
e	George Powell Jane Ortiz
dy	Randy Morales

8. Book Search

NOTE: You will need method public static string **GetBookTitlesContaining**(BookShopContext context, string input) and public StartUp class.

Return the **titles** of **book**, which contain a **given string**. Ignore casing.

Return all **titles** in a **single string**, each on a **new row**, ordered alphabetically.

Example

Input	Output
sK	A Catskill Eagle The Daffodil Sky The Skull Beneath the Skin
WOR	Great Work of Time Terrible Swift Sword

9. Book Search by Author

NOTE: You will need method public static string **GetBooksByAuthor**(BookShopContext context, string input) and public StartUp class.

Return **all titles of books and their authors' names** for books, which are written by authors whose last names **start with the given string**.

Return a single string with each title on a new row. **Ignore** casing. Order by **book id** ascending.

Example

Input	Output
R	The Heart Is Deceitful Above All Things (Bozhidara Rysinova) His Dark Materials (Bozhidara Rysinova) The Heart Is a Lonely Hunter (Bozhidara Rysinova) …
po	Postern of Fate (Stanko Popov) Precious Bane (Stanko Popov) The Proper Study (Stanko Popov) …

10. Count Books

NOTE: You will need method `public static int` **CountBooks**`(BookShopContext context, int lengthCheck)` and `public StartUp` class.

Return **the number of books,** which have a **title longer than the number** given as an input.

Example

Input	Output	Comments
12	169	There are 169 books with longer title than 12 symbols
40	2	There are 2 books with longer title than 40 symbols

11. Total Book Copies

NOTE: You will need method `public static string` **CountCopiesByAuthor**`(BookShopContext context)` and `public StartUp` class.

Return the **total number of book copies for each author**. Order the results **descending by total book copies**.

Return all results in a **single string**, each on a **new line**.

Example

Output
Stanko Popov - 117778 Lyubov Ivanova - 107391 Jane Ortiz – 103673 …

12. Profit by Category

NOTE: You will need method `public static string` **GetTotalProfitByCategory**`(BookShopContext context)` and `public StartUp` class.

Return the **total profit of all books by category**. Profit for a book can be calculated by multiplying its **number of copies** by the **price per single book**. Order the results by **descending by total profit** for category and **ascending by category name**.

Example

Output
Art $6428917.79

```
Fantasy $5291439.71
Adventure $5153920.77
Children's $4809746.22
…
```

13. Most Recent Books

NOTE: You will need method `public static string` **GetMostRecentBooks**(`BookShopContext context)` and `public StartUp` class.

Get the most recent books by categories. The **categories** should be ordered by **name alphabetically**. Only take the **top 3** most recent books from each category - ordered by **release date** (descending). **Select** and **print** the **category name**, and for each **book** – its **title** and **release year**.

Example

Output

```
--Action
Brandy ofthe Damned (2015)
Bonjour Tristesse (2013)
By Grand Central Station I Sat Down and Wept (2010)
--Adventure
The Cricket on the Hearth (2013)
Dance Dance Dance (2002)
Cover Her Face (2000)
…
```

14. Increase Prices

NOTE: You will need method `public static void` **IncreasePrices**(`BookShopContext context)` and `public StartUp` class.

Increase the prices of all books released before 2010 by 5.

15. Remove Books

NOTE: You will need method `public static int` **RemoveBooks**(`BookShopContext context)` and `public StartUp` class.

Remove all **books**, which have less than **4200 copies**. Return an **int** - the **number of books that were deleted** from the database.

Example

Output

```
34
```