Database Library Manager

Author: Lukáš Dvořák
E-mail: luky.dvorak07@gmail.com
Date: 11.1. 2026
School: Střední průmyslová škola elektrotechnická, Praha 2, Ječná 30
Project: School project - Application using database

1. Project Overview

Database Library Manager is a Windows Form application made for managing a library.
The user is able to:
- View, add, update and delete books, authors,genres, users and loans.
- Loaning a book and returning said book via transactions to keep the data consistent.
- View reports on book and author loans.
- Import data into authors and genres from CSV file.

This project utilizes:
- Repository Pattern for accessing database.
- Microsoft SQL server as a relational database.

2. Requirements

- Adding, updating and deleting authors, genres, users and loans.
- Viewing data via DataGridView tables.
- Loaning and returning books via transactions.
- Importing new data from CSV for authors and genres.
- Viewing reports of statistics for author and book.

3. Use cases

Use case example - Adding Book:
- User opens book and picks the option to add book.
- User fills out data for a new book (author, title,...).
- User adds a new book.
- Book is now visible in the data Grid table.

Use case example - Deleting book:
- User opens book and picks the option to delete book.
- User fills out books id to be deleted.
- User deletes the book.
- Book is no longer visible in the data Grid table.

4. Database E-R model

The application uses Microsoft SQL Server and the user is prompted to import the database with Export.sql which contains:

- Author - id, firstName and lastName
- User - id, username and email
- Book - id, bookTitle, genre_id, author_id, available, price and state (can be either New, Damaged, Torn, Used)
- Genre - id and genre
- Loan - id, user_id, book_id, pickUpDate, returnDate

obrázek

5. Importing

User is able to import data from CSV into authors and genres via OpenFileDialog

Author format

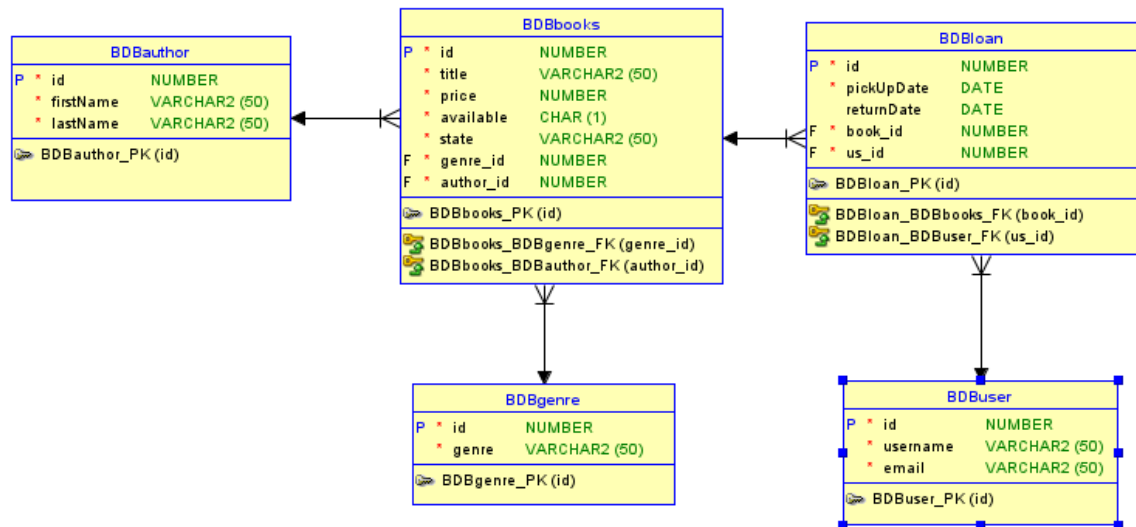

```
1    firstName,LastName
2    George,Orwell
3    Juiji,Ito
4    Morgan,Holderhek
```

Genre format


```
1    genre
2    Fantasy
3    Sci-Fi
4    Utopia
5    Romance
```

6. Configuration

Configuration is taken from the appsettings.json file that is in the exe folder.

BDBauthor

P *	id	NUMBER
*	firstName	VARCHAR2 (50)
*	lastName	VARCHAR2 (50)

BDBauthor_PK (id)

BDBbooks

P *	id	NUMBER
*	title	VARCHAR2 (50)
*	price	NUMBER
*	available	CHAR (1)
*	state	VARCHAR2 (50)
F *	genre_id	NUMBER
F *	author_id	NUMBER

BDBbooks_PK (id)

BDBbooks_BDBgenre_FK (genre_id)
BDBbooks_BDBauthor_FK (author_id)

BDBloan

P *	id	NUMBER
*	pickUpDate	DATE
	returnDate	DATE
F *	book_id	NUMBER
F *	us_id	NUMBER

BDBloan_PK (id)

BDBloan_BDBbooks_FK (book_id)
BDBloan_BDBuser_FK (us_id)

BDBgenre

P *	id	NUMBER
*	genre	VARCHAR2 (50)

BDBgenre_PK (id)

BDBuser

P *	id	NUMBER
*	username	VARCHAR2 (50)
*	email	VARCHAR2 (50)

BDBuser_PK (id)

7. Instaling

How to install guide is in the READ.ME on gitHub:
https://github.com/Dvormen/Database_library_manager/blob/master/README.md

8. Libraries

Libraries needed to run this application are:
- System.Data.SqlClient

9. Summary

- Five tables within the database with relations and constains
- Using Repository Pattern
- CVS importing
- Test cases for installation and use of application
- Reports with aggregated data
- Transactions when operating with loans