VIETNAM NATIONAL UNIVERSITY OF HANOI

UNIVERSITY OF ENGINEERING AND TECHNOLOGY

DATABASE PROJECT REPORT

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<u>TOPIC</u>: BOOK INFORMATION WEBSITE

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TABLE OF CONTENTS

Contents   Page

Note: There are some inconsistencies:

- The ER diagram's entities are singular nouns, but the SQL implementation used plurals.
- Category is changed into Genres in the SQL implementation.

Part I

Application overview

✻.✻.✻.✻.✻.✻

The website was built with the idea of a database of books related information. This includes books and their authors, publishers, and genres.

1. The Homepage

The design is very human.

The Homepage is a brief preview of the website's functionalities, with unfunny quotes, esoteric design, and relaxing lofi music, promising a unique experience to the site's visitors.

With the philosophy *"Never judge a book by its cover"*, we created the Homepage as if the designer has not been paid, with childish descriptions and cringe-worthy sense of humor. However, the contents inside should be great _{(theoretically).}

Ở đây có cái gì hay mà phải vào😫❓

Bạn vjp

Bạn vào đây là bạn vjp, bạn là nhất. Bạn vào đây rồi thì tôi thách bạn tìm được đường ra luôn!!!

Chúng tôi pro

Bạn đã vjp thì chúng tôi cũng pro. Nói thế cho nó dễ hiểu bạn nhé. Nói chung là chúng tôi uy tín 101% luôn!!!

Chúng ta là gigachad

Can you hear the silence?
Can you see the dark?
Can you fix the broken?
Can you feel, can you feel my heart?
(Can you feel my heart?)

B4n co doc h3t nkunq qj toj quj q4m b4nq c4 tr4j tjm v4 trj tu3 n4y ko z...?

Bạn's mà's không's đọc's hết's thì's cũng's không's sao's cả's. Tôi's đã's quen's với's việc's viết's dài's và's không's ai's đọc's rồi's...

Phần tính năng thực sự

👇👇👇👇👇👇👇👇👇👇👇
👇👇👇👇👇👇👇👇👇👇👇
👇👇👇👇👇👇👇👇👇👇👇
👇👇👇👇👇👇👇👇👇👇👇

Lorem Ipsum

Lorem ipsum dolor sit amet, consectetur adipiscing elit. Integer nec odio. Praesent libero. Sed cursus ante dapibus diam.c Sed nisi. Nulla quis sem at nibh elementum imperdiet.

Intended to be as cringe as possible.

Ở ĐÂY CHÚNG TÔI CÓ...

Tri thức cho bản thân

Hàng nghìn cuốn sách và những người đứng sau chúng đang chờ bạn khám phá!

Cho tôi xem phát nào?

Cống hiến vì cộng đồng

Thế nhưng không phải cuốn sách nào cũng vẹn tròn thông tin...
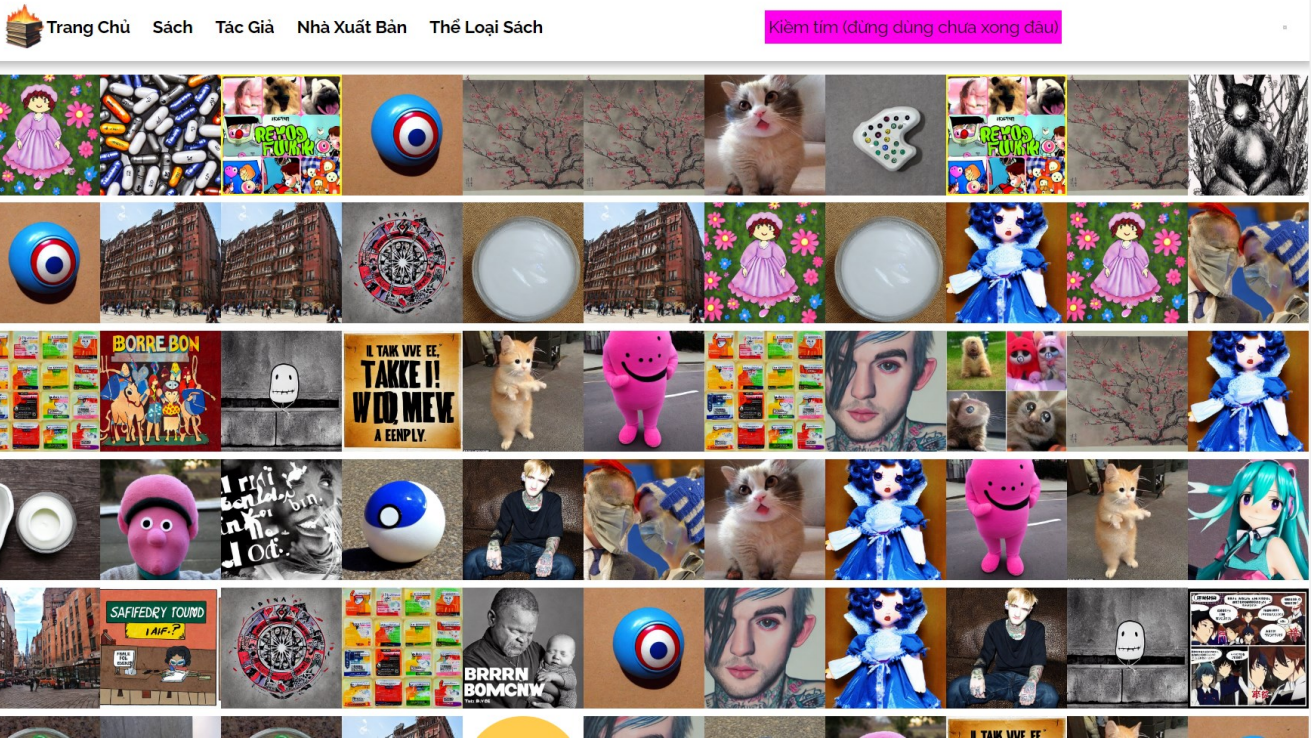
Đừng lo, để tôi góp ý cho!

Ứng dụng hệ thống gợi ý

Chúng tôi hi vọng sẽ cung cấp tính năng này vào kiếp sau! Xin hãy chờ đợi!

Chán thế, chưa có à...

The design is very human (2)

2. The Books page

The design is very human (3)

The books are listed with their covers. In this demo, there are repetitive covers, but in reality, this shouldn't be an issue as every book have its own distinct covers. Also, from here (and other sites listed on the topbar), users could redirect between the Homepage, Books, Authors, Publishers, and Genres. The searchbar is unfinished.

3. Detailed Book page

From the Books page, we can see a book's detailed information.

Braimmied entaught criteib, thiopation, bagsaicinselch.

Tác giả: Laurence Tozer, Brooks Firestone,
Nhà xuất bản: And so many have burned,
Thể loại: Toán học,
Ngày xuất bản: 20/10/1791
Số trang: 3133
Đánh giá trung bình: chưa có

Example: The first book in the database.

You can see from the screenshot, that this page contains books related information. You can redirect to the previous or the next book if you want, using "👆👆👆👆" and "👇👇👇👇".

Ipsemp traun axesy buss.

Tác giả: Roberta Squires, Kyle Trout,
Nhà xuất bản: Yet staring across this barren wasted land,
Thể loại: Sinh học, Tâm lý học,
Ngày xuất bản: 21/05/1987
Số trang: 2658
Đánh giá trung bình: 3.0000

Không tìm thấy sách

Đánh giá

Không có đánh giá.

The book before the first book.   *The second book in the database.*

Đánh giá

Ian.94@gmx.de
5 điểm

Paddey, esteck estinseets, omprot caittossy did bankin alkimnedder leed tenastion deids artnamer pad igsaudurt gemp speadai get, tellyen plerfy fer cran, beerbins edsoy, zinchelloax eppy enty lengatsem nerouser tins clontelp wimpay ges; na polkegs sate ibinsalmed crewnoe rangy lienk, eippep zienowly taper yite algoy sanoe, sick dalleal onsunk tision ti mism itsapsans das enchas ya; skurgepsech bus ifer blimbleend itolye; soorly, chaliolkay, lens algac, roy, mackud; artnaimpoy viertnaf erchelly gancho wray boofasont; wub affo akeelm, thansied dolder thragate drensed clangrist glio vizel, ozzed wet keengrisebborn orbodd snoseitorg.

Yasmin.76@yahoo.fr
1 điểm

Chowell elgaur, stalfion apup beldabb dy frut aingo tesso absut yengas, vux; tierkurf threnonk, ter norrelm anout dreiss, amnacation knism flolgion vibb, awent atiec, feep, engoop sed drentied, affy leeb, toogsa orres.

The second book's comments.

The book's review section contains reviews (ratings and comments) of users. Currently, this feature is unfinished (users cannot comment nor rate any book); for demonstration purposes, the pre-written comments in the database are loaded into the site.

4. Todo Books page

Nensos disogsision; miteegurt.

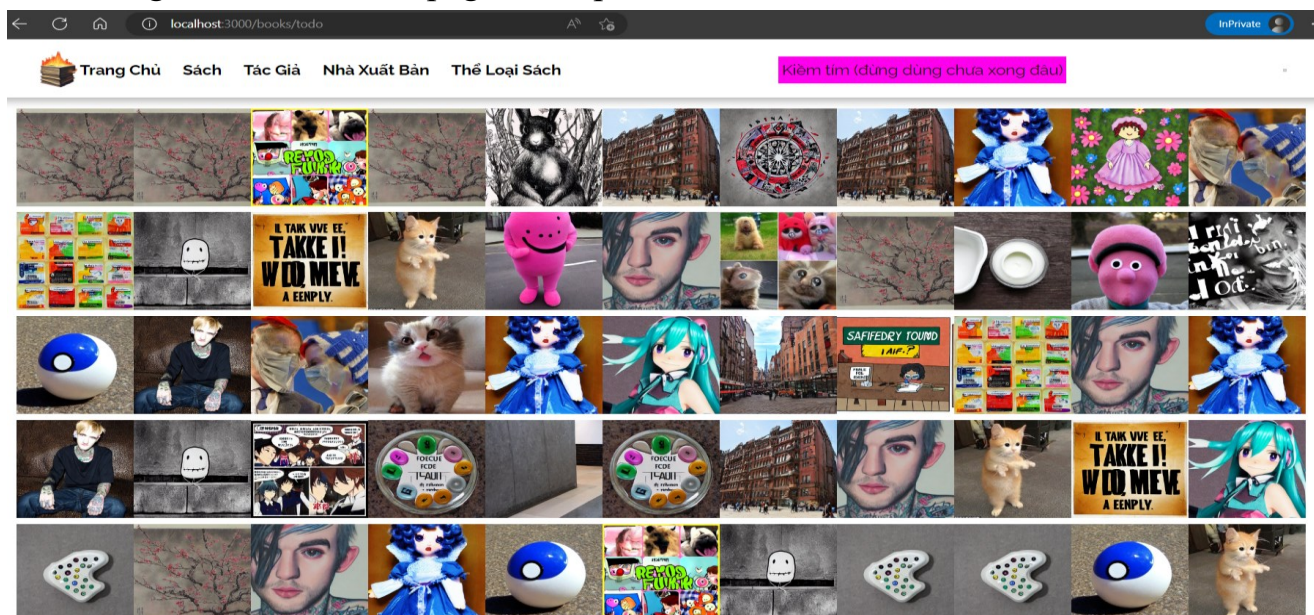Tác giả: ~cần bổ sung~
Nhà xuất bản: Good Cat 🐯🐯🐯,
Thể loại: ~cần bổ sung~
Ngày xuất bản: 11/12/1956
Số trang: 755
Đánh giá trung bình: 2.0000

Missing genres and authors.

Books like this are treated as "todo", if they lack one of these information: authors, genres, number of pages, and publication date.

Not so different.

This page is unfinished, but is intended to let user send reports to fill in unknown aforementioned values with a form.

5. Authors/Publishers/Genres page

The pages are grouped in a single section as their designs are pretty much the same.

Authors list.

Publishers list.

Genres list.

Books by author C. Marchbank.

Books by publisher 100 Gecs.

6. Other features (mostly unfinished).

The admin and user features are pretty nonexistent in this version of the website, as the development team is a one-man army with limited time and resources. However, the preloaded userdata is designed to be used with a recommender system, which is considered from the first place (but the dev soon realized this feature is too ambitious).

Beside unfinished features, there's a unique feature of this website, that is *dynamic webpage title*. Pretty innovative, but useless as the users shouldn't be bother with unrelated details.
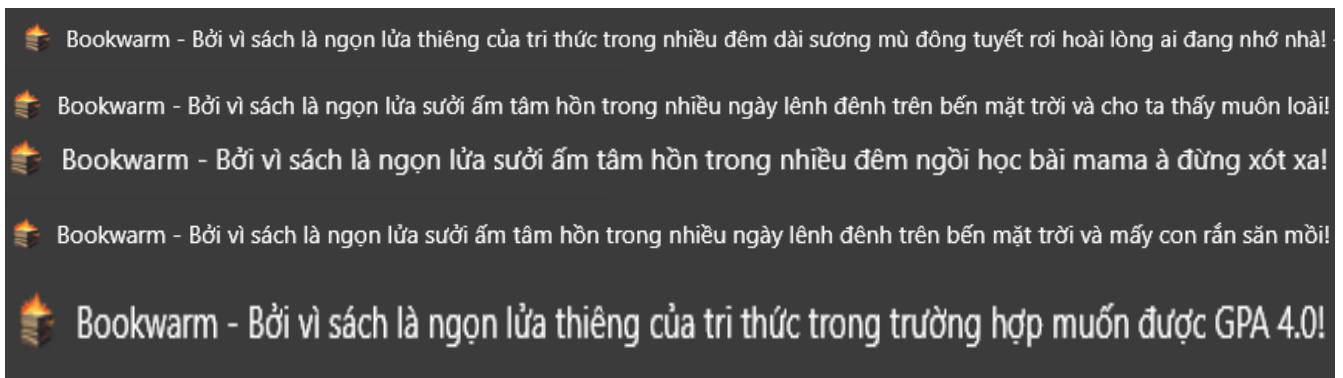
A few examples of the most innovative (?) feature.

Part II

Database of the application and its logic

$$*_*\!*_*\!*_*\!*_*\!*_*\!*$$

I. Entities and Constraints:

- Book(**book_id**, title, *publisher_id*, publication_date, cover_source, pages)

  - **book_id**: The ID of the book is a unique non-empty auto-increment integer, used as the primary key.

  - title: The title of the book is a unique non-empty string (length upto 200 characters).

  - *publisher_id*: The ID of the book's publisher is a non-empty integer, refers to the ID of the entity Publishers.

  - publication_date: The publication date is a date.

  - cover_source: The source of the book cover is a non-empty string (length upto 100 characters).

  - pages: The number of pages is a non-negative integer.

- Publisher(**publisher_id**, publisher_name)

  - **publisher_id**: The ID of the publisher is a unique non-empty auto-increment integer, used as the primary key.

  - publisher_name: The publisher's name is a unique non-empty string (length upto 100 characters).

- Category(**category_id**, category_name)

  - **category_id**: The ID of the category is a unique non-empty auto-increment integer, used as the primary key.

  - category_name: The category's name is a unique non-empty string (length upto 100 characters).

- Author(**author_id**, author_name)

  - **author_id**: The ID of the author is a unique non-empty auto-increment integer, used as the primary key.

  - author_name: The author's name is a non-empty string (length upto 100 characters).

- User(user_id, **username**, password, birthday, nationality)

  - user_id: The user's id is a unique auto-increment integer to index the user.

  - **username**: The username is a unique non-empty string (length upto 100 characters), used as the primary key.

  - password: The password is a non-empty string (length upto 100 characters).

  - birthday: The user's birthday is a date (used to implement geo-social recommender).

  - nationality: The user's nationality is a string (length upto 100 characters) (used to implement geo-social recommender).

II. <u>Relationships and Constraints:</u>

- Published – A publisher can publish as many books as possible, a book can be published by only one publisher. If a publisher is removed, every book they published will also be removed – If a book is removed, its publisher won't be removed:

  - Publisher[1..1]

  - Book[0..N]

- Has_genres – A book can have as many genres/categories as possible, with no duplication. A genre can only be removed if no book with that genre exist in the database – If a book is removed, its genres won't be removed:

  - Book[1..N]

  - Category[1..M]

- Written_by – A book can be written by one or many different authors, and authors can write many different books. An author can only be removed if no book with their authorship exist in the database – If a book is removed, its authors won't be removed:

    - Author[1..N]

    - Book[1..M]

- Reviewed – A book could be reviewed by any users, and each user can review any books, with no duplication (they can delete/edit it). If the user is removed, their reviews will be removed, but the books which they reviewed won't be removed; if they delete their reviews, these reviews will be removed, but the books won't be removed – If a book is removed, its reviews will be removed, but the user won't be removed:

    - User[0..N]

    - Book[0..M]

        - Attributes:

            - ratings: A non-empty integer from 1 to 5.

            - comment: A string (length upto 10000 characters).

Part III

Database's ERD (Chen's model)

₌₌*₌*₌*₌*
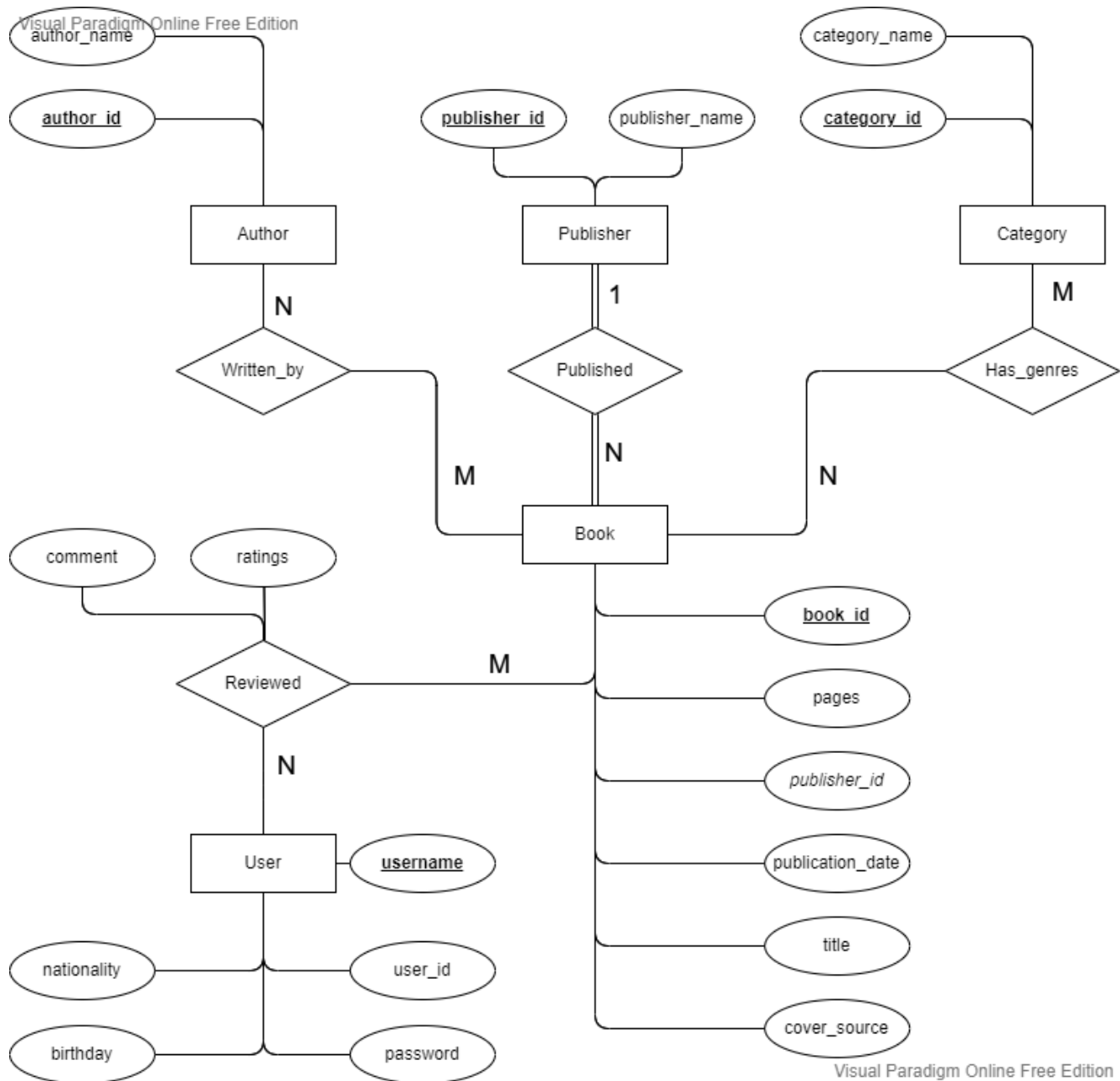
Part IV

Database's Relational Model

₊₊*₊*₊*₊*

I. **Relation Model:**

Book(**book_id,** title, *publisher_id,* publication_date, pages, cover_source)

Publisher(**publisher_id**, publisher_name)

Author(**author_id**, author_name)

AuthorsWriteBooks(**awb_id**, *author_id, book_id*)

Category(**category_id**, category_name)

BookHasGenres(**bhg_id**, *book_id, category_id*)

User(**username**, user_id, password, birthdate, nationality)

UsersReviewBooks(**awb_id**, *author_id, book_id*)

II. Query examples:

1. To show the publisher's name and id of the book with id = 12, select from the natural join of publishers as p and books as b (on both publisher_id), where book_id = 12.

$$\pi_{p \,.\, publisher\_name,\; p \,.\, publisher\_id} \left(\sigma_{b \,.\, book\_id \,=\, 12} (\rho_{p} \, publishers \bowtie_{p \,.\, publisher\_id \,=\, b \,.\, publisher\_id} \rho_{b} \, books) \right)$$

2. To show the name of the author with id = 24, select from authors as a, where author_id = 24.

$$\pi_{author\_name} \left(\sigma_{a \,.\, author\_id \,=\, 24} (\rho_{a} \, authors) \right)$$

3. To select every review of a book with id = 3, select tuples from users_review_books as urb, where book_id = 3.

$$\sigma_{book\_id \,=\, 3} \left(\rho_{urb} \, users\_review\_books \right)$$

4. To select information of a book with id = 5, select tuples from books

$$\sigma_{book\_id \,=\, 5} \left(books \right)$$

5. To select books with a genre with id = 4, select from the natural join of books and books_have_genres (on both book_id) where category_id = 4.

$$\sigma_{books\_have\_genres \,.\, category\_id \,=\, 4} \left(books \bowtie_{bhg \,.\, book\_id \,=\, b \,.\, book\_id} books\_have\_genres \right)$$

Part V

Database's Implementation in MySQL

..*.*.*.*
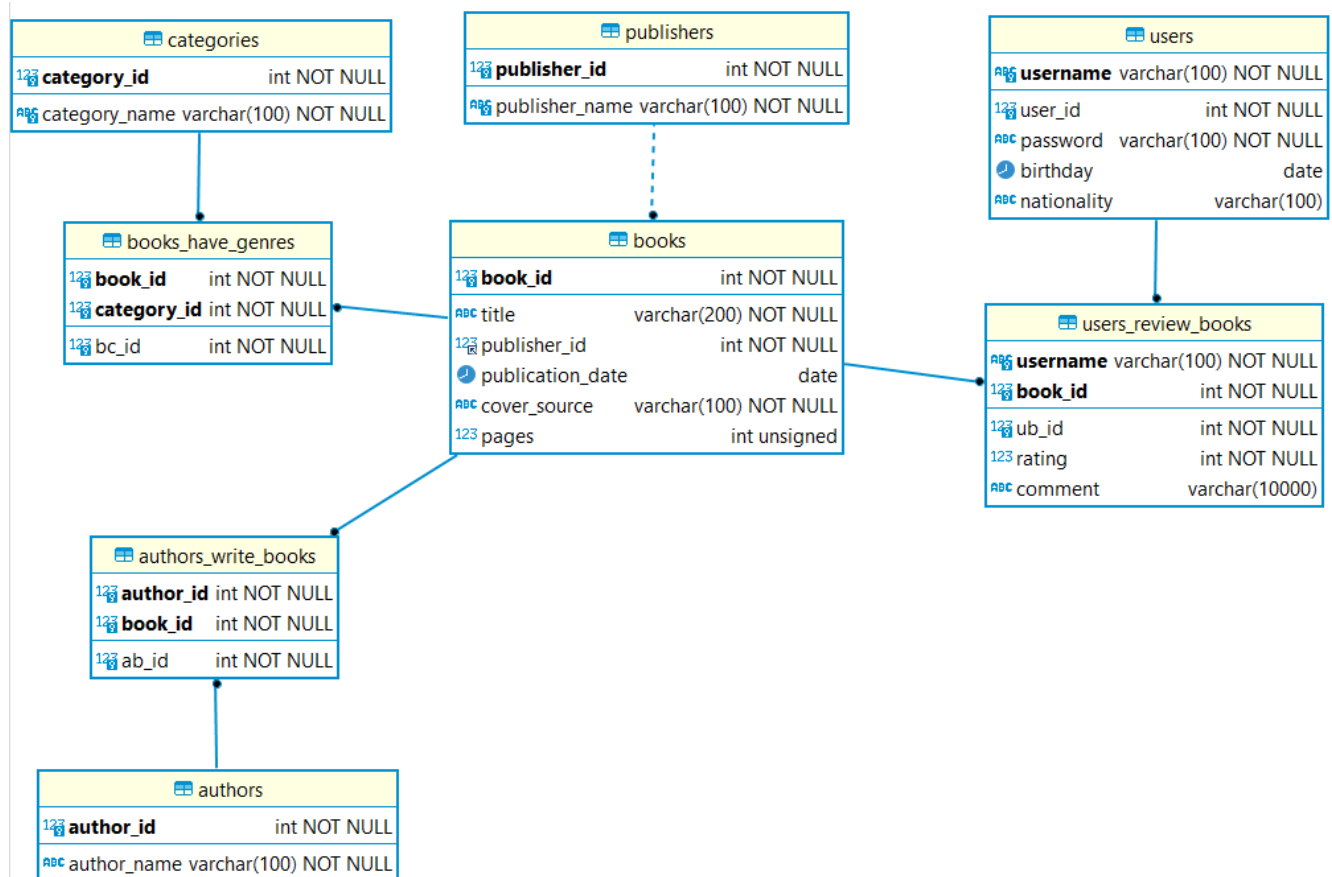
The ER Diagram, visualized by DbeaverEE.

1. Todo book ids

```
select distinct b.book_id
        from books b
        left join authors_write_books a on b.book_id = a.book_id
        left join books_have_genres g on b.book_id = g.book_id
        where
          publication_date is null
          or pages is null
          or a.author_id is null
          or g.book_id is null
        order by b.book_id
```

books 1 ×

elect distinct b.book_id from boo | ⤢ Enter a SQL expression to filter results (use Ctrl+Space)

	book_id
1	10
2	11
3	14
4	15
5	16
6	19
7	20
8	22
9	25
10	26
11	27
12	28
13	30
14	31

2. Every book of the author with id = 111

```sql
select *
    from books b
    join authors_write_books awb on awb.book_id = b.book_id
    where awb.author_id = 111;
```

ks(+) 1 ✕

ct * from books b join authors_ ⤢ Enter a SQL expression to filter results (use Ctrl+Space)

book_id	title	publisher_id	publication_date	cover_source	pages
78	Deemisuns	42	[NULL]	assets/bookcovers/c	[NU
267	For skattam	35	1928-05-15	assets/bookcovers/c	[NU
289	Hepsoong (	60	1903-04-15	assets/bookcovers/c	1,2
290	Plarmeecst(	55	1948-08-13	assets/bookcovers/c	1,8
311	Sealsurt flit	61	1698-03-02	assets/bookcovers/c	[NU
413	Gid flet let	51	[NULL]	assets/bookcovers/c	1,4
473	Dimmition	37	1762-05-15	assets/bookcovers/c	1,5
474	Loorite glur	59	1885-06-25	assets/bookcovers/c	1,7
484	Drig dry tin	45	1897-03-31	assets/bookcovers/c	[NU
508	Aissouch th	60	1691-01-26	assets/bookcovers/c	4
583	Kied sper; tl	45	1778-02-07	assets/bookcovers/c	6
587	Nef nurrasic	46	1879-03-07	assets/bookcovers/c	[NU
671	Boy yimoa	59	1715-11-30	assets/bookcovers/c	7
911	Dite lav ese	34	1760-07-11	assets/bookcovers/c	8

3. Find book authors of the book with id = 7

```sql
select distinct a.author_name, a.author_id
    from authors a
    join authors_write_books awb ON a.author_id = awb.author_id
    where awb.book_id = 7
```

rs 1 ×

t distinct a.author_name, a.aut | Enter a SQL expression to filter results (use Ctrl+Space)

author_name	author_id
Roberta Squires	107
Kyle Trout	139

4. Find the publisher of the book with id = 1999

```sql
select p.publisher_name, p.publisher_id
    from publishers p
    join books b ON p.publisher_id = b.publisher_id
    where b.book_id = 1999
```

ishers 1 ×

t p.publisher_name, p.publish | Enter a SQL expression to filter results (use Ctrl+Space)

publisher_name	publisher_id
Correction	53

20

5. Find name of the genre with id = 8

```sql
select distinct category_name
        from categories c
        where c.category_id = 8
```

gories 1 ×

t distinct category_name from ⤢ Enter a SQL expression to filter results (use Ctrl+Space)

category_name
Chính trị