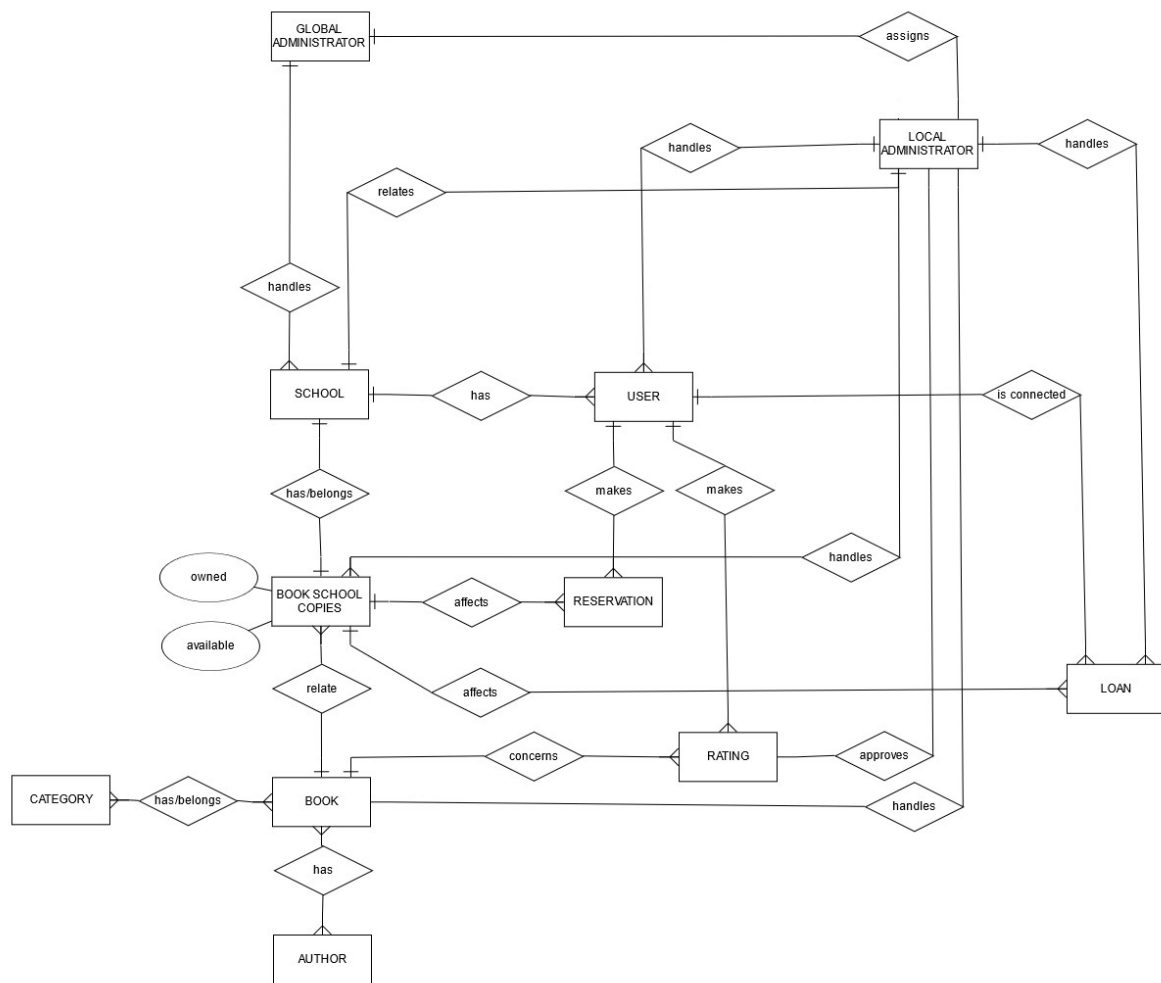
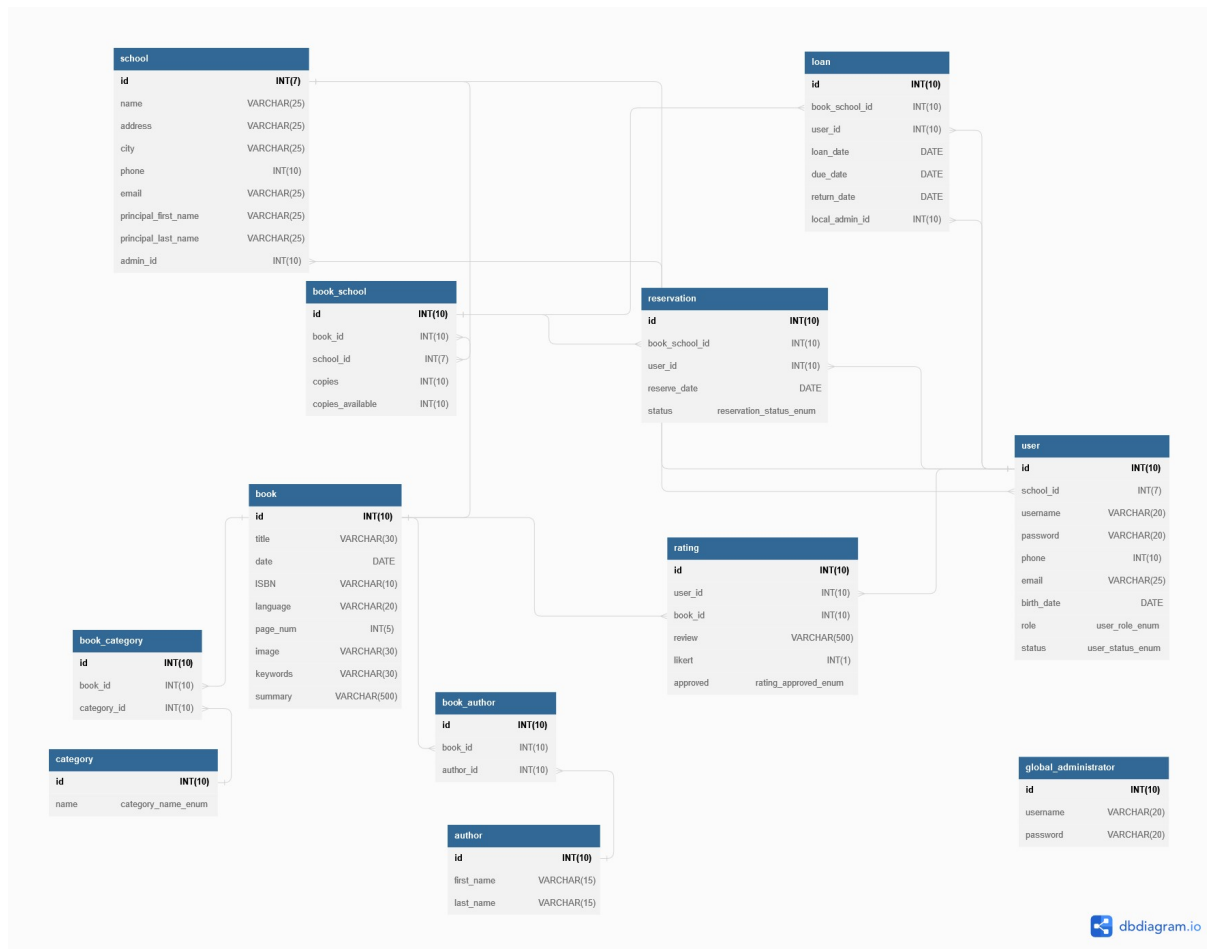


ENTITY RELATIONSHIP DIAGRAM



RELATIONAL SCHEMA



Github repo

Github repo: github.com/thanosretsas/LibraryDatabase

DDL και DML στο SQL folder

Installation Guide for Windows

- 1) Download Xampp: Windows XAMP
- 2) Create separate file in C for xampp
- 3) Run xampp_start.exe and xampp_control.exe (start Apache and MySQL)
- 4) Download from Git ddl and dml in "C:\xampp\mysql\bin"

- 5) Download from git PHP files in "C:\xampp\htdocs"
- 6) Open cmd prompt and type: cd "C:\xampp\mysql\bin"
- 7) Next type: mysql -u root -p
- 8) On Password: press enter
- 9) Open file "create_database.sql" and copy and paste contents to cmd prompt
- 10) Open "insert_into_library_db_file" and copy and paste contents to cmd prompt
- 11) Open browser and navigate to 'http://localhost/phpmyadmin/'
- 12) In browser type 'http://localhost/Library%20Project/login.html'
- 13) Login as user (see user manual)

To configure cancel_expired_reservations.php to execute daily on Windows, create a Windows Scheduled Task.

- 1)Open the Task Scheduler App: Press the Windows key, type "Task Scheduler," and select the "Task Scheduler" app from the search results.
 - 2)Create a new task: Click on "Create Basic Task" in the right-hand pane.
 - 3)Provide a name and description:
Enter a name for the task e.g. cancel_expired_reservations and an optional description e.g. Delete expired reservations from school library data base
 - 4)Set the trigger: Select "Daily" and click "Next."
 - 5)Set the start date and time:
Choose the date and time when you want the task to start running, then click "Next."
 - 6)Choose the action: Select "Start a program" and click "Next."
 - 7)Specify the program/script:
In the "Program/script" field, browse to the location of php.exe, that is
C:\xampp\php\php.exe
Add argument the path to cancel_expired_reservations.php, that is
C:\xampp\htdocs\cancel_expired_reservations.php
 - 8) Click "Next" and then "Finish" to create the scheduled task.
- The task scheduler will now run the PHP script daily at the specified time.

ΠΑΡΑΔΟΧΕΣ

- 1) Ένας χρήστης ανήκει σε ένα μόνο σχολείο, κατά συνέπεια και ένας χρήστης Εκπαιδευτικός συνδέεται με ένα μόνο σχολείο.
- 2) Όταν ο Κεντρικός Διαχειριστής εισάγει ένα καινούριο σχολείο πρέπει να δημιουργήσει και ένα καινούριο χρήστη που είναι ο Τοπικός Διαχειριστής του σχολείου, ώστε στη συνέχεια να μπορέσει αυτός να βάλει και τους υπόλοιπους χρήστες του σχολείου (για λόγους συντομίας δεν κάνουμε έλεγχο αν υπάρχει ήδη αυτός ο χρήστης).
- 3) Σε τυχόν αρχικοποίηση της Βάσης με δεδομένα (populate) θα πρέπει να έχει ληφθεί μέριμνα ώστε για κάθε σχολείο να έχει οριστεί Τοπικός Διαχειριστής.
- 4) Όταν ένας χρήστης κάνει Login, πρέπει να διαλέξει και το ρόλο του και θα του εμφανιστεί το αντίστοιχο μενού. Ειδικά για τον Τοπικό Διαχειριστή, ο οποίος είναι και Εκπαιδευτικός, ισχύουν τα εξής:
 - Αν θέλει να κάνει εργασίες τοπικής διαχείρισης του σχολείου του, θα πρέπει να επιλέξει ως ρόλο τον Τοπικό Διαχειριστή (Local Administrator)
 - Αν θέλει να χρησιμοποιήσει τις υπηρεσίες χρήστη που δικαιούται ως εκπαιδευτικός, θα πρέπει να επιλέξει ως ρόλο τον Εκπαιδευτικό (Teacher).
- 5) Ένας χρήστης εγγράφεται μέσω του Τοπικού Διαχειριστή, οπότε για να αρχίσει η διαδικασία της εγγραφής, πρέπει να πάει στη βιβλιοθήκη. Ο Τοπικός Διαχειριστής από την επιλογή Users του μενού του τον εισάγει στο σχολείο του και τυπώνει την Κάρτα Δανεισμού του. Εισάγει μόνο μαθητές και εκπαιδευτικούς του σχολείου του.
- 6) Ο Τοπικός Διαχειριστής μπορεί να τροποποιήσει το σχολείο ενός χρήστη, γιατί ένας μαθητής πχ μπορεί να αλλάξει σχολείο. Με αυτόν τον τρόπο από εδώ και πέρα το χρήστη θα τον βλέπει και θα τον διαχειρίζεται άλλος Τοπικός Διαχειριστής.
- 7) Όταν ο Τοπικός Διαχειριστής διαχειρίζεται τους χρήστες μπορεί να βλέπει και να ενημερώνει και τα passwords τους. Επιτράπηκε αυτή η λειτουργικότητα γιατί σε ένα σχολείο με χρήστες μαθητές μπορεί να γίνουν πολλά μπερδέματα με τους κωδικούς.
- 8) Μη αυτοματοποιημένη (μέσω της εφαρμογής) καταχώρηση της αίτησης για αλλαγή Τοπικού Διαχειριστή. Ο χρήστης Εκπαιδευτικός ή το σχολείο του γνωστοποιεί με πρόσφορο τρόπο την αίτηση στον Κεντρικό Διαχειριστή και αυτός από την επιλογή Handle Local Administrators του μενού του αλλάζει το ρόλο του παλιού Τοπικού Διαχειριστή σε Εκπαιδευτικό, επιλέγει τον καινούριο από τους εκπαιδευτικούς του σχολείου και τον εγκρίνει.
- 9) Όταν ένας χρήστης πάει στη βιβλιοθήκη για να δανειστεί ένα βιβλίο, θα πρέπει να έχει την κάρτα δανεισμού μαζί του ή να θυμάται το user id.
- 10) Αν ένας χρήστης πάει στη βιβλιοθήκη να δανειστεί ένα βιβλίο, χωρίς πρότερη κράτηση, και δεν υπάρχουν διαθέσιμα αντίτυπα του βιβλίου, δεν του δημιουργεί αυτόματα ο Τοπικός Διαχειριστής κράτηση σε αναμονή (pending reservation), πρέπει ο ίδιος ο χρήστης να μπει και να αιτηθεί κράτηση. Συνοπτικά κράτηση δημιουργεί μόνο ο κάθε χρήστης για τον εαυτό του.
- 11) Δεν γίνεται κάποιος έλεγχος για το πλήθος των αξιολογήσεων που μπορεί να υποβάλει ένας χρήστης.
- 12) Τα backup της βάσης θα έπρεπε να κρατούνται σε διαφορετικό folder, π.χ. με το όνομα Backup και όταν ο Τοπικός Διαχειριστής κάνει Restore να μπορεί να κάνει Browse και να

επιλέγει το κατάλληλο αρχείο. Για λόγους συντομίας και απλότητας, αποθηκεύουμε το backup στον ίδιο φάκελο του Project και ο Τοπικός Διαχειριστής πληκτρολογεί ο ίδιος το όνομα του αρχείου.

- 13) Για ένα βιβλίο καταχωρούμε μέχρι 3 συγγραφείς (1 απαραίτητα) και μέχρι 3 κατηγορίες (1 απαραίτητα)
- 14) Οι έλεγχοι για τις προϋποθέσεις των κρατήσεων και των δανεισμών γίνονται στα PHP scripts, η ενημέρωση των διαθέσιμων αντιτύπων στο σχολείο γίνεται με triggers.
- 15) Όταν ο Κεντρικός Διαχειριστής διαγράφει ένα σχολείο, δε γίνεται κάποια άλλη ενέργεια ως προς τους χρήστες ή τα βιβλία ή τις κρατήσεις και τους δανεισμούς που σχετίζονταν με το σχολείο.

INDICES

Στη MariaDB τα primary και foreign keys είναι ήδη indexed, συνεπώς τα μοναδικά πεδία που χρειαζόντουσαν επιπλέον indexing με βάση τα queries και τις συχνές αναζητήσεις είναι τα:

Author (first_name, last_name): idx_author_first_and_last_name

Book (title): idx_title

Category (name): idx_category_name

Loans (loan_date): idx_loan_date

User (role): idx_role

USER MANUAL

Login to School Library System

Username:

Password:

Role:

☒ Student ☐ Teacher ☐ Local Administrator ☐ Global Administrator

In login the user has to provide his username and password as well as the role he is logging in with (Student, Teacher, Local Administrator OP Global Administrator)

STUDENT or TEACHER

After logging in the user sees this menu with 4 main buttons and 2 buttons that execute the queries.

[Home](#) [Logout](#)

Welcome USER

[View and Reserve Books](#) [Handle Reservations](#) [Ratings](#) [User Profile](#)

3.3.1 VIEW, SELECT and RESERVE Books

3.3.2 VIEW loaned Book Titles

After pressing the “View and Reserve Books” button he is transferred to this layout.

Select and Reserve Books

Search by Title

Search by Category

Search by Author First Name

Search by Author Last Name

Search

Select a category

Title	Date	ISBN	Language	Page Number	Author	Category	Actions
The Great Gatsby	2022-01-15	1234567890	English	256	John Smith, William Brown	fiction, sci-fi	Reserve
1984	2020-05-10	5432109876	English	328	David Davis, Michael Davis	sci-fi	Reserve
The Catcher in the Rye	2022-06-12	2468135790	English	224	Daniel Anderson, Jessica Johnson	sci-fi, poetry	Reserve
The Alchemist	2022-04-18	8642097531	English	208	Emma Jones	fiction, mystery	Reserve
The Hidden Gem	2022-07-15	9781234567	English	350	John Smith, Olivia Miller	other	Reserve
The Science of Universe	2022-08-05	9780123456	English	500	Alexander Thomas	mystery	Reserve
The Art of Painting	2022-09-25	9780987654	English	320	Michael Smith	sci-fi	Reserve

Here he can view all the books in his school along with some information about them and he can reserve whichever one he wants (if a book doesn't have available copies in the user's school the reservation will be pending and will be activated once a copy is available). The user can also search in his school library according to the fields: Title, Category and Author Name.

After pressing the button “Handle Reservations” the user is transferred to this layout.

[Home](#) [Logout](#)

Handle Reservations

Title	Reservation Date	Status	Actions
1984	2022-05-15	active	Delete
To Kill a Mockingbird	2022-07-01	active	Delete

Here he can see information about his reservations and has the ability to delete them. It is here that he can check a reservation has changed from **pending** to **active**.

After pressing the button “User Ratings” the user is transferred to this menu.

[Home](#) [Logout](#)

User Ratings

Add a Rating

Book Title:

Likert Rating:

Review:

Submit

Your Ratings

Book Title	Review	Likert Rating	Approved	Action
1984	Didn't like the ending	2	yes	Delete Edit

Here he can submit a new rating for a book. The ratings that a user Teacher submits are default Approved. The ratings that a user Student submits are Not Approved. The user can also see all his previous ratings, edit them and delete them. When he edits a rating, if he is a student, the rating becomes Not Approved.

After pressing the button “User Profile” After the user is transferred to this menu.

[Home](#) [Logout](#)

Update User Profile

First Name
Olivia

School ID
2

Update

Last Name
Taylor

Phone
555

Username
oliviati

Birth Date
08 / 15 / 1998

Password
••••••••

Role
student

Email
oliviati@example.com

Status
active

After pressing the button “User Profile” a Student can see all his info and he can update his password. A teacher can edit any part of his info he wants, except his school, his role and his status.

The button for the first query does the same thing as the button “View and Reserve Books”

The button for the second query shows the user all the book titles he has loaned.

[Home](#) [Logout](#)

VIEW loaned Book Titles

Title

The Art of Painting

To Kill a Mockingbird

LOCAL ADMINISTRATOR

After the Local Administrator logs in he sees this menu.

[Home](#) [Logout](#)

Welcome LOCAL ADMINISTRATOR

Make Loan

View Loans and Reservations

Book Returns

Handle Ratings

Add a User

Handle existing Users

Add a Book

My Profile

3.2.1 VIEW Books WITH Search Criteria

3.2.2 USERS with late LOANS

3.2.3 Average RATING per USER and CATEGORY

After pressing the button “Make Loan” the Local Administrator is transferred to this menu.

[Home](#) [Logout](#)

Handle a Loan

User ID:

Book Title:

Search

User Information:
Anderson, William

Book Information:

Book Title	Copies	Copies Available	Action
The Great Gatsby	5	5	<div>Loan</div>

Here he can enter the user id of a student or teacher from his school along with a book title from the school library. If certain conditions are met, he can insert a loan for that user by pressing the button “Loan”.

After pressing the button “View Loans and Reservations” the Local Administrator is transferred to this menu.

[Home](#) [Logout](#)

Local Administrator - Loans & Reservations

User ID:

Submit

Loans

User ID	Book Title	Loan Date
7	The Great Gatsby	2022-10-05
7	The Power of Mindfulness	2023-02-01

No reservation records found for the user.

Here he can type a user id (from his school) and see his loans and reservations

After pressing the button “Book Returns” he is transferred to this menu where he can type the id and book title of the user and the book he is returning

[Home](#) [Logout](#)

Return a Book

User ID:

Book Title:

[Search](#)

User Information:
Anderson, William

No book copy found in school for the given book title.

Here he can type the id of the user and the book title he is returning.

After pressing the button “Handle Ratings” the Local Administrator is transferred to this menu.

Approve or Reject Ratings					
Rating ID	User ID	Book ID	Review	Likert	Actions
8	5	3	Just emblematic.	5	Approve Reject
13	22	2	So good!	5	Approve Reject

Here he can approve or reject a rating by pressing the appropriate button. When rejected the rating is deleted from the db.

After pressing the button “Add a User” the Local Administrator is transferred to this menu.

Insert a User

First Name	Last Name	Username	Password
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Email	Phone	Birth Date	Role
<input type="text"/>	<input type="text"/>	<input type="text" value="mm / dd / yyyy"/>	<input type="text" value="Student"/>

Here he can add a new user and his info to his school. After successful insertion of the new user his Loan Card is printed on the screen

New User successfully inserted.

[Home](#) [Logout](#)

Loan Card

User ID: 56

First Name: Nikos

Last Name: Papas

School ID: 1

Username: npapas

Phone: 2103535355

Email: npapas@sch.gr

After pressing the button “Handle existing Users” the Local Administrator is transferred to this menu.

View, Update, Delete USERS

Id	School ID	First Name	Last Name	Username	Password	Phone	Email	Birth Date	Role	
5	1	Michael	Davis	michaeld	password	555	michaeld@example.com	2001-02-20	student	
7	1	William	Anderson	williams	password	555	williams@example.com	1993-11-20	teacher	
10	1	Ava	Martin	avam	password	555	avam@example.com	1994-04-12	student	
11	1	Sophie	Baker	sophieb	password	555	sophieb@example.com	1985-07-10	teacher	
14	1	Liam	Lee	liaml	password	555	liaml@example.com	1988-12-25	teacher	
17	1	Oliver	Davis	oliverd	password	555	oliverd@example.com	1993-02-10	teacher	
22	1	Anna	Apostolou	annaap	password	2107723234	annaap@sch.gr	2010-06-15	student	

Here he can delete a user or edit his info. If he presses the button “Edit” he sees this menu.

Update a USER

First Name	Last Name	School ID	Username
<input type="text" value="Anna"/>	<input type="text" value="Apostolou"/>	<input type="text" value="1"/>	<input type="text" value="annaap"/>
Password	Phone	Email	Birth Date
<input type="password" value="••••••••"/>	<input type="text" value="2107723234"/>	<input type="text" value="annaap@sch.gr"/>	<input type="text" value="2010-06-15"/>
Role	Status		
<input type="text" value="student"/>	<input type="text" value="active"/>		

After pressing the button “Add a Book” the Local Administrator is transferred to this menu.

Add New Book

Title:

ISBN:

Page Number:

Date:

Language:

Image File:

Keywords:

Summary:

Authors:

Author 1 First Name (Required):

Author 1 Last Name (Required):

Author 2 First Name (Optional):

Author 2 Last Name (Optional):

Author 3 First Name (Optional):

Author 3 Last Name (Optional):

Categories:

Here he can add all book info along with the details of the copies of this book in his school.

After pressing the button “My Profile” the Local Administrator is transferred to this menu.

Update Profile

First Name

Last Name

Username

Password

School ID

Phone

Birth Date

Role

1

500007

01 / 01 / 2001

local_admin

Here he can edit his personal info, except his school, his role and his status.

After pressing the Queries buttons the Local Administrator is presented with these menus:

3.2.1

Books per Title and Author

Title:

Author:

Enter title

Enter author

Search

Search Results

Title	Author
The Great Gatsby	John Smith
To Kill a Mockingbird	Emma Johnson
1984	Michael Davis
Pride and Prejudice	Michael Smith
The Catcher in the Rye	Jessica Johnson

Here he can search books by title and author.

3.2.2

Users with Late Loans

First Name:

Last Name:

Search

Search Results

First Name	Last Name	Loan Date	Due Date	Days Overdue
thanos	retsas	2022-02-01	2022-02-15	474
John	Doe	2022-03-10	2022-03-24	437
Kiki	Retsa	2022-05-12	2022-05-26	374
thanos	retsas	2022-06-18	2022-07-02	337

Here he can search for users with late loans,

3.2.3

Average Rating per User and Category

First Name:

Last Name:

Search

Search Results

User ID	First Name	Last Name	Category	Average Rating
---------	------------	-----------	----------	----------------

Here he can see average rating per user and category.

GLOBAL ADMINISTRATOR

After the Global Administrator logs in he sees this layout.

Welcome GLOBAL ADMINISTRATOR

Add a School

Handle Schools

Handle Local Administrators

Backup

3.1.1 SCHOOL LOANS(per month, year)

3.1.2 AUTHORS with loaned books and TEACHERS with loans (per category)

3.1.3 TEACHERS under 40 assorted by NUMBER OF borrowed BOOKS

3.1.4 AUTHORS with NO BOOK LOANS

3.1.5 LOCAL ADMINS with same Book LOANS in a year, LOANS > 20

After pressing the button “Add a School” the Global Administrator is transferred to this menu.

Insert a SCHOOL

SCHOOL INFO

School Name	Address	City	Phone
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Email	Principal First Name	Principal Last Name	
<input type="text" value="Enter email"/>	<input type="text"/>	<input type="text"/>	

LOCAL ADMINISTRATOR INFO

First Name	Last Name	Username	Password
<input type="text"/>	<input type="text"/>	<input type="text"/>	<input type="text"/>
Email	Phone	Birth Date	
<input type="text"/>	<input type="text"/>	<input type="text"/>	

Here he can add a new school and his information and he must perform along the addition of its Local Administrator's info (a new user with role Local Administrator is created).

After pressing the button “Handle Schools” the Global Administrator is transferred to this menu.

View, Update, Delete SCHOOLS

Id	School Name	Address	City	Phone	Email	Principal Name	Principal Surname	L
1	5 Gym Halandri	Methonis 25, 153 42, Hala	Halandri	2104556777	5gym@sch.gr	Babiss	Makris	1
3	Lincoln High	123 Main St	Anytown	555	lincolnhigh@example.com	James	Johnson	1
4	Washington High	456 Elm St	Otherville	555	washingtonhigh@example.co	Sarah	Smith	1
5	Sunshine High School	123 Sunshine Street	Sunnyville	555	info@sunshinehighschool.c	Emily	Anderson	2

Here he can edit school info or delete a school. When he presses the button “Edit” he sees this menu

Update a SCHOOL

School Name	Address	City	Phone
<input type="text" value="5 Gym Halandri"/>	<input type="text" value="Methonis 25, 153 42, Hala"/>	<input type="text" value="Halandri"/>	<input type="text" value="2104556777"/>
Email	Principal First Name	Principal Last Name	Local Administrator
<input type="text" value="5gym@sch.gr"/>	<input type="text" value="Babiss"/>	<input type="text" value="Makris"/>	<input type="text" value="1"/>

Where he can update school info.

After pressing the button “Handle Local Administrators” the Global Administrator is transferred to this menu.

Assign a new LOCAL ADMINISTRATOR

User ID	School ID	First Name	Last Name	Username
1	1	thanos	retsas	sd
2	1	Kiki	Retsa	ert
3	1	John	Doe	johnd
13	3	Isabella	Smith	isabellas
18	4	Eleanor	Morgan	eleanorm
20	5	Grace	Taylor	gracet

Here he sees all Local Administrators of schools and he can press the “Change” button. Then he will see this menu

Assign a new LOCAL ADMINISTRATOR from school teachers

User ID	First Name	Last Name	Assign
16	Alexander	Wilson	<button>Assign</button>
19	Benjamin	Allen	<button>Assign</button>

Here he is presented with a list of teachers in the school of the local administrator to be changed. He can choose to which he will assign the role of Local Administrator. The role of the previous admin upon a new Local Administrator assignment is automatically changed to Teacher.

After pressing the button “Backup” the Global Administrator can create a db backup in the project folder. The name of the backup file is based on current date and time. Upon success he sees this screen.

```
Command: C: mpp\mysql\bin\mysqldump --host=localhost --user=root library_db2 > 2023-06-04_21-32-26.sql
Database backup created successfully. Backup file: 2023-06-04_21-32-26.sql
```

After pressing the button “Restore” the Global Administrator is transferred to this menu.

Restore Database

Backup File:

Restore

Here he can select the backup file from which to perform the restore.

After pressing the Queries buttons the Global Administrator is presented with these menus:

3.1.1

School Loans (per month, year)

Month: Year:

Search

School ID	School Name	Total Loans
1	5 Gym Halandri	13
3	Lincoln High	4
4	W. Lincoln High	2

Here he can see loans searching by month and/or by year

3.1.2

AUTHORS with loaned books and TEACHERS with loans (per cat

Category Name:

Select Category

Search

Category: mystery

Authors: Teachers:

Here he can search by Category and see authors with books in category and teachers that have borrowed books from this category.

3.1.3

Teachers under 40 assorted by number of borrowed Boook

ID	Username	Loan Count
7	williama	2
4	emmaj	1
17	oliverd	1

Here he can see Teachers under 40 assorted by number of borrowed books.

3.1.4

Authors with no Book Loans

ID	First Name	Last Name
7	Emma	Jones
8	David	Davis
9	Olivia	Miller
10	Daniel	Anderson
11	Sophia	Wilson
12	Emily	Taylor
13	Alexander	Thomas
2	Emma	Johnson
3	Michael	Davis
4	Michael	Smith

Here he can see authors that nobody has borrowed their book.

3.1.5

3.1.5 Local Administrators with same Book Loans in a year, Loar

Local Admin 1 ID	Local Admin 1 First Name	Local Admin 1 Last Name	Local Admin 2 ID	Local Admin 2 First Name	Local Admin 2 Last Name
No local administrators found.					

Here he can see Local Administrators that have loaned the same number of books in a year, if that number of loans is greater than 20.

3.1.6

TOP 3 pairs of Categories with most borrowed books

Category 1	Category 2	Loan Count
fiction	sci-fi	6
sci-fi	fiction	6

Here he can see the top 3 pairs of categories with most borrowed books.

3.1.7

AUTHORS with 5 books less than AUTHOR with most BOOK

Author ID	Author Name	Book Count
No authors found		

Here he can see authors with 5 books less than the author who has written most BOOKS.