

DataBase

Project Report

Bookstore System

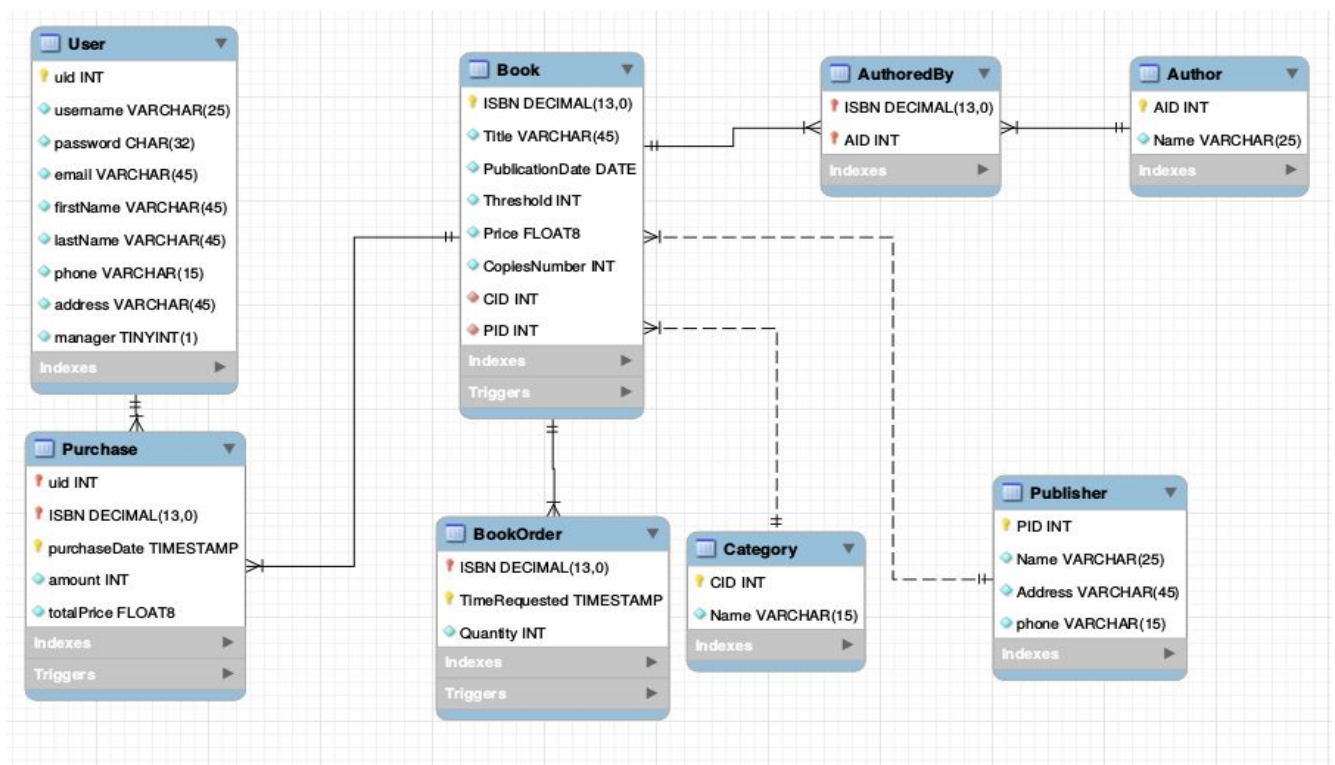
Team

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I. Objective :

It is required to analyze, design and implement a database system to support the operations of a simplified online bookstore. Also, It is required to create the necessary forms to perform these operations.

II. The database ERD diagram :



III. Detailed Analysis Of Database :

○ Overall Design

Categories were made into a separate table since many might have the same category so to make updates consistent, we only add a foreign key to the book to a category. Publisher was made into its own entity too like categories. Authors might write multiple books and the same book can have multiple authors so logically we separated them to keep updates consistent.

Users and books are related by entity of purchases, which indicates the different purchase of users from book. This entity allows us to have history of sales and purchase for both users and book, as well as have statistics of how

many books were sold and how much was gained. The last entity of orders indicates the different orders of each books and the quantity requests. Attributes like no of copies of books and author id and other were made unsigned when suitable.

○ **Triggers**

A trigger Before Delete on Orders : Assumed to be a confirmed order which updates the book and adds the amount of the order to the suitable book number of copies.

A trigger Before Update on Books : If the new value for number of copies is going to be less than 0 then stop transaction.

A trigger After Update on Books : If number of copies falls under threshold, add an order that compensates the difference between them.

A trigger Before Insert on Purchase : When a purchase is inserted, we must reduce the book copies of the book purchased by the purchase amount. If not possible stop operation.

○ **Indexes**

Index on category name since it is unique to help in search and updates.

Index on publisher name since it is unique to help in search and updates.

Index on author name since it is unique to help in search and update.

Index on cid,pid, and title in the book table to help us when searching on books.

Index on author id in the authoredBy table to help us when searching for specific authors.

Indexes on username and email in User table to help us in log in, registration and search operations.

Indexes on isbn and uid in Purchase table to help us in getting statistiques needed for report generation.

○ **Transactions**

Most of the simple operations as inserting, deleting and updating that were simple were done in its own transaction like in tables like publisher, author, category, order and user.

A Transaction was made in purchasing a cart, as only when we can successfully add all purchases required of cart we commit, otherwise we rollback. This is found in method handleCart in class PurchasesDAO.

A Transaction was made when adding a new book where we only commit if the book itself is added to book table, and all additions to authored by to

indicate its authors are successful. Otherwise, rollback. Found in addBook in BookDataDAO.

A Transaction was made when updating a book where only when the book itself is modified, all of its changed authors are actually changed in authoredBy do we commit, otherwise rollback. Found in updateBook in BookDataDAO.

IV. Code Modules (WEB):

- Bean package

Package containing the basic models for the entities of the database.

- Config Package

Package containing the configuration for security filter, which url are allowed to be served only to users, and which ones only to manages.

- Dao Package

Package containing the code linking the database commands with the code, it acts as the access point to the database by providing functions that include all the sql commands needed and executing it, it protects against code injections and will return the suitable beans for each request. It contains separate modules for each type of entity operations, and includes transaction logic in it.

- Filter Package

Package containing the filter responsible for intercepting all requests and verifying that the request has the permission to access and get served from the server using the security configuration, and either allowing the request through or blocking it and returning a suitable response.

- Provider Package

Package containing the provider interface which has the database information needed for connection and a provider class that provides a connection that will be used in all DOA classes.

- Request Package

Package containing a wrapper class for the request that contains the user role of the request.

- Servlet Package

Package containing the different servlets that serve their suitable requests.

AuthorManagerServlet.java : serves all manager operations on authors table (add, edit, search).

LogoutServlet.java : serves logout requests.

AutoCompleteServlet.java : serves autocomplete requests for any data.

ManagerServlet.java : serves the manager page.

BookManagerServlet.java : serves all manager operations on books table(search, add, edit).

OrderManagerServlet.java : serves all manager operations on orders table(search, add, confirm).

BookServlet.java : serves user search requests on books table.

PublisherManagerServlet.java : serves all manager operations on publisher table(search, add, edit).

CartServlet.java : serves all user requests regarding additions, removals and showing carts.

PurchaseServlet.java : serves user checkout request of the cart.

CategoryManagerServlet.java : serves all manager operations on category table(search, add, edit).

RegistrationServlet.java : serves actual user registration requests if post request, and serves the actual registration page if get.

EditUserServlet.java : serves all user requests regarding changes in his profile.

ReportServlet.java : serves all report requests by returning the report as an encoded base 64 string of the suitable report pdf.

HomeServlet.java: serves the home page.

UserManagerServlet.java : serves all manager operations on user table(search, promote).

LoginServlet.java : serves the login requests if post, serves login page if get.

UserServlet.java : serves the user page.

○ Utils Package

AppUtils.java : responsible of storing and retrieving session variables, and redirection urls.

PaymentUtils.java : responsible of simulating a payment gateway.

UrlPatternUtils.java : responsible of parsing and verifying url strings.

ParseUtils.java : responsible of some minor verification operations on parameters passed from the user requests.

SecurityUtils.java : responsible of handling some security checks to see if a request needs to have permission for the page it wants or if it even needs one.

○ Non-Source-File Used

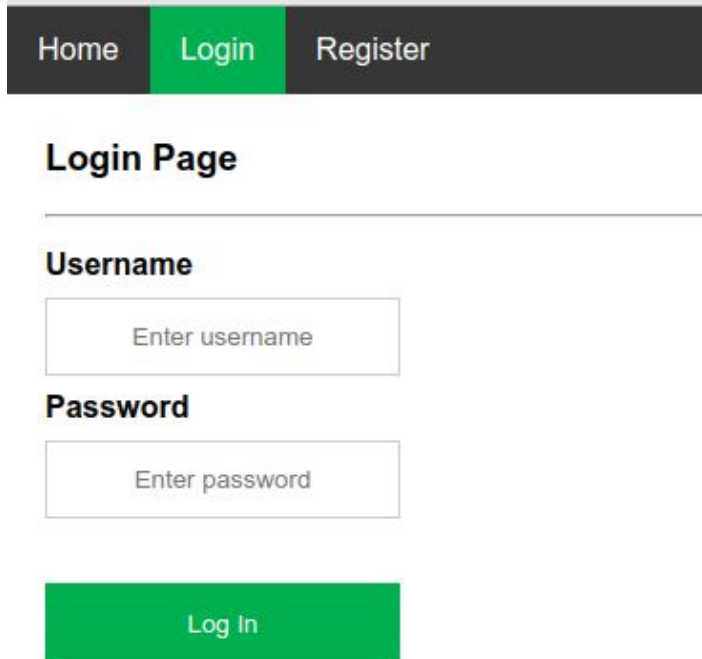
Datapopulator.jar : populates our database with 6 categories, a root user with password as 'root' and username 'root', potentially 500,000 author and 500,000. Then inserts 1,000,000 book with each book having up to 5 different authors. This jar was made by us but its source code is omitted as it is not seen as part of the project.

Reports_generation.sql : contains sql commands used in jasper reports.

Create_bookstore.sql : the database creation script containing all table creations, indexes definitions and triggers definitions.

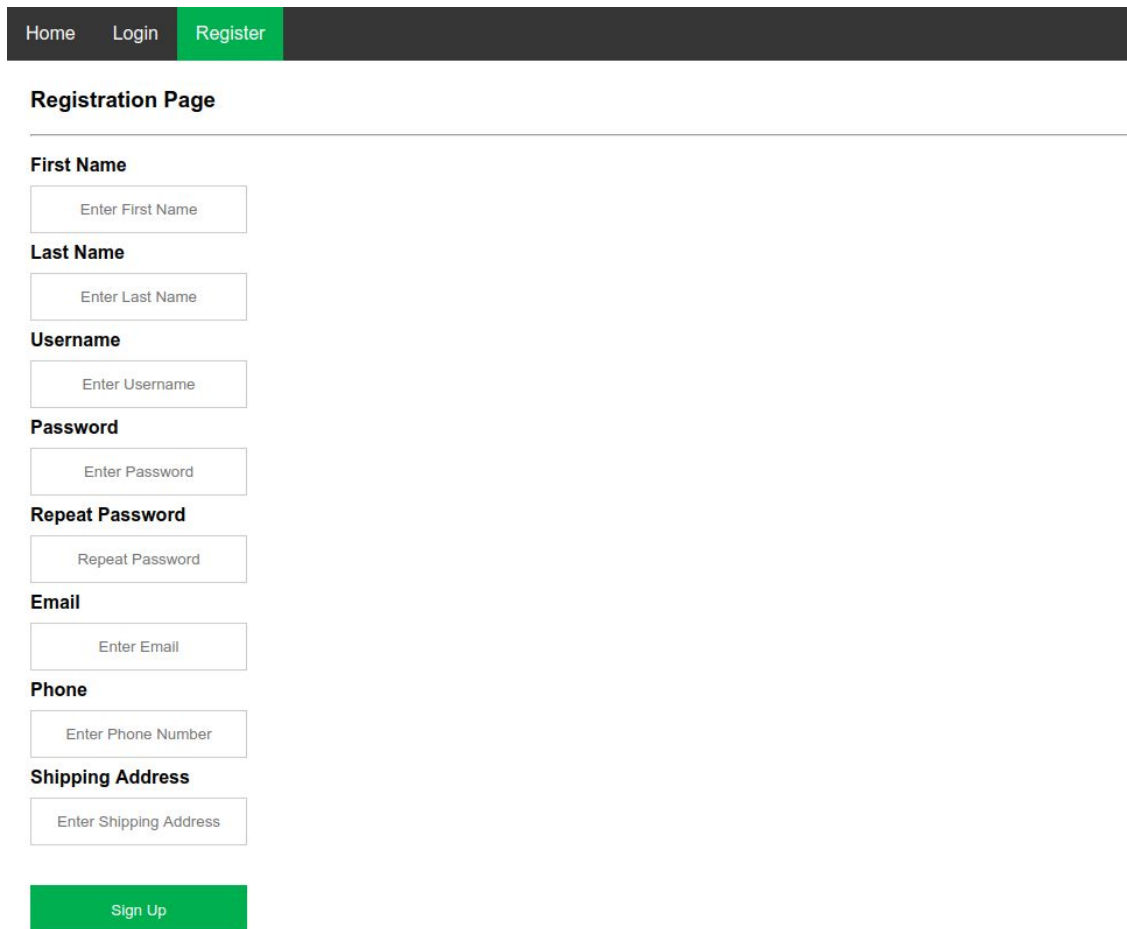
V. Sample Screen shots :

○ Sign in



The screenshot shows the login page of a web application. At the top, there is a dark navigation bar with three buttons: 'Home', 'Login' (highlighted in green), and 'Register'. Below the navigation bar, the title 'Login Page' is displayed. The form consists of two input fields: 'Username' and 'Password', each with a placeholder text 'Enter username' and 'Enter password' respectively. Below these fields is a green 'Log In' button.

○ Sign up



The screenshot shows the registration page of a web application. At the top, there is a dark navigation bar with three buttons: 'Home', 'Login', and 'Register' (highlighted in green). Below the navigation bar, the title 'Registration Page' is displayed. The form consists of several input fields: 'First Name' (placeholder: 'Enter First Name'), 'Last Name' (placeholder: 'Enter Last Name'), 'Username' (placeholder: 'Enter Username'), 'Password' (placeholder: 'Enter Password'), 'Repeat Password' (placeholder: 'Repeat Password'), 'Email' (placeholder: 'Enter Email'), 'Phone' (placeholder: 'Enter Phone Number'), and 'Shipping Address' (placeholder: 'Enter Shipping Address'). Below these fields is a green 'Sign Up' button.

○ Search view user side

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

Options

- Search
- My Cart
- Edit Profile
- Change Password

Search For Books

ISBN :

Enter ISBN

Title :

Enter Title

Lowest Price :

Enter Lowest Price

Highest Price :

Enter Highest Price

Category :

Enter Category

Publisher :

Enter publisher name

Publication Date :

Enter Publication Date

Authors :

Enter authors names
seperated by ;

☐ In Stock

Show: 5

ISBN	Title	Category	Publication Date	Price	Publisher	In Stock	Add To Cart
0	expansion project never	History	0673-10-15	958.2169	Kitty Tisha Timi	59	Add to Cart
1	points chart lightly	Art	1771-04-13	407.26947	Ora Florri Renelle	40	Add to Cart
2	armament officiate nicely	Religion	1030-02-12	287.0731	Emilee Sue Karena	40	Add to Cart
3	inclinations plug queerly	Science	1139-12-27	951.9761	Calypso Stella Krystalle	100	Add to Cart
4	forecasts separate unfortunately	Art	1542-02-02	554.9475	Cass Bathsheba Lizzie	100	Add to Cart

Showing 1 to 5 of 799741 records

Pages: Previous 1 2 3 ... 159949 Next

○ Full search view user side

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

Options

- Search
- My Cart
- Edit Profile
- Change Password

Search For Books

ISBN :

11

Title :

Enter Title

Lowest Price :

Enter Lowest Price

Highest Price :

Enter Highest Price

Category :

Enter Category

Publisher :

Enter publisher name

Publication Date :

Enter Publication Date

Authors :

Enter authors names
seperated by ;

☐ In Stock

Show: 5

ISBN	Title	Category	Publication Date	Price	Publisher	In Stock	Add To Cart
11	enlistments clap woefully	Religion	1064-10-18	36.592167	Hedwiga Cecily Remy	119	Add to Cart

Showing 1 of 1 records (filtered from 799741 total records)

Pages: Previous 1 Next

○ Search view for Manager side

[Home](#)
[Manager](#)
[User](#)
[Logout](#)

Options
[Books](#)
[Authors](#)
[Publishers](#)
[Categories](#)
[Orders](#)
[Users](#)
[Reports](#)

[Search Books](#)
[Add Book](#)
[Edit Book](#)

ISBN :

Title :

Lowest Price :

Highest Price :

Category :

Publisher :

Publication Date :

Authors :

Min Threshold :

Max Threshold :

Min Copies Number :

Max Copies Number :

Show:

ISBN	Title	Category	Publication Date	Price	Publisher	Number Of Copies	Threshold	Edit Book
0	expansion project never	History	0673-10-15	958.2169	Kitty Tisha Timi	59	90	Edit Book
1	points chart lightly	Art	1771-04-13	407.26947	Ora Florri Renelle	40	79	Edit Book
2	armament officiate nicely	Religion	1030-02-12	287.0731	Emilee Sue Karena	40	58	Edit Book
3	inclinations plug queerly	Science	1139-12-27	951.9761	Calypso Stella Krystalle	100	31	Edit Book
4	forecasts separate unfortunately	Art	1542-02-02	554.9475	Cass Bathsheba Lizzie	100	80	Edit Book

Showing 1 to 5 of 799741 records

Pages: Previous [1](#) 2 3 ... 159949 Next

○ My cart view

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

Options
[Search](#)
[My Cart](#)
[Edit Profile](#)
[Change Password](#)

My Cart

[To Checkout](#)
[Clear Cart](#)

Total price : 396.8496 \$

Show:

ISBN	Title	Price	In Stock	Copies	Total Price
11	enlistments clap woefully	36.592167	119	<input type="text" value="3"/>	109.776505
2	armament officiate nicely	287.0731	40	<input type="text" value="1"/>	287.0731

Showing 2 of 2 records

Pages: Previous [1](#) Next

○ Checkout view :

HomeUserLogout

Options

Search

My Cart

Edit Profile

Change Password

My Cart

To Cart

Confirm Purchase

Total price : 396.8496 \$

Owner :

Enter Owner Name

CVV :

Enter ccv

Card Number :

Enter card number

Expiration Date :

January

2018

VISA

MasterCard

AMEX

○ Edit profile view :

HomeUserLogout

Options

Search

My Cart

Edit Profile

Change Password

Edit Profile

Username

amro

Email

amro@amro.com

First Name

amro

Phone

0123123

Last Name

amro

Shipping Address

amro amro amro

Edit Profile

[Home](#)
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Options

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[My Cart](#)
[Edit Profile](#)
[Change Password](#)

Change Password

Old Password

New Password

Repeat New Password

○ Manager promote user view

[Home](#)
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Options

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Upgrade Users

Username :
Email :

First Name :
Last Name :

Phone :
Address :

User Type :

Show:

Username	First Name	Last Name	Email	Phone	Address	Upgrade To Manager
root	firstRoot	lastRoot	root@root.com	013123552	13 root street, java city, pc	<input type="button" value="Promote User"/>
amro	amro	amro	amro@amro.com	0123123	amro amro amro	<input type="button" value="Promote User"/>
mico	mico	mico	mico@mico.com	0111111111	mico mico mico	<input type="button" value="Promote User"/>
maro	maro	maro	maro@maro.com	044444	maro maro maro	<input type="button" value="Promote User"/>
groot	groot	groot	groot@groot.com	014123124	i am groot	<input type="button" value="Promote User"/>

Showing 5 of 5 records

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○ Manager add author view

Authors

Search Authors	Add Author	Edit Author
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Author Name :

○ Manager add publisher view

Home	Manager	User	Logout
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Options
 Books
 Authors
Publishers
 Categories
 Orders
 Users
 Reports

Publishers

Search Publishers	Add Publisher	Edit Publisher
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Publisher Name : Address :

Phone :

○ Manager add order view :

Home	Manager	User	Logout
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Options
 Books
 Authors
 Publishers
 Categories
Orders
 Users
 Reports

Orders

Search Orders	Add Order
---------------	-----------

ISBN: Quantity:

○ Manager add book view :

Home	Manager	User	Logout
Options Books Authors Publishers Categories Orders Users Reports			
Books			
Search Books Add Book Edit Book			
ISBN :	Enter ISBN	Title :	Enter Title
Price :	Enter Price	Threshold :	Enter Threshold
Category :	Enter Category	Publisher :	Enter publisher name
Publication Date :	Enter Publication Date	Authors :	Enter authors names seperated by ;
Available Copies :	Enter Copies Number		
Add Book			

○ Manager edit book view :

Home	Manager	User	Logout
Options Books Authors Publishers Categories Orders Users Reports			
Books			
Search Books Add Book Edit Book			
Old ISBN :	0	ISBN :	0
Title :	expansion project neve	Price :	958.2169
Category :	History	Publisher :	Kitty Tisha Timi
Publication Date :	10/15/673	Authors :	Larisa Aila Genvieve;Darcey Orelie Gisella;Caril Nadine
Threshold :	90	Available Copies :	59
Edit Book			

○ Report View

[Home](#) [Manager](#) [User](#) [Logout](#)

Options
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[Publishers](#)
[Categories](#)
[Orders](#)
[Users](#)
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Reports

[Monthly Total Book Sales](#) [Monthly Individual Books Sales](#) [Top 5 Users\(Money Spend\) last 3 months](#)
[Top 5 Users\(Books Bought\) last 3 months](#) [Top 10 Books\(Money Gain\) last 3 months](#) [Top 10 Books\(Amount Sold\) last 3 months](#)

Online Bookstore

Report 1-1

Sum(amount)	sum(totalPrice)
166	4761.7629799999995

