

DataBase

Project Report

Bookstore System

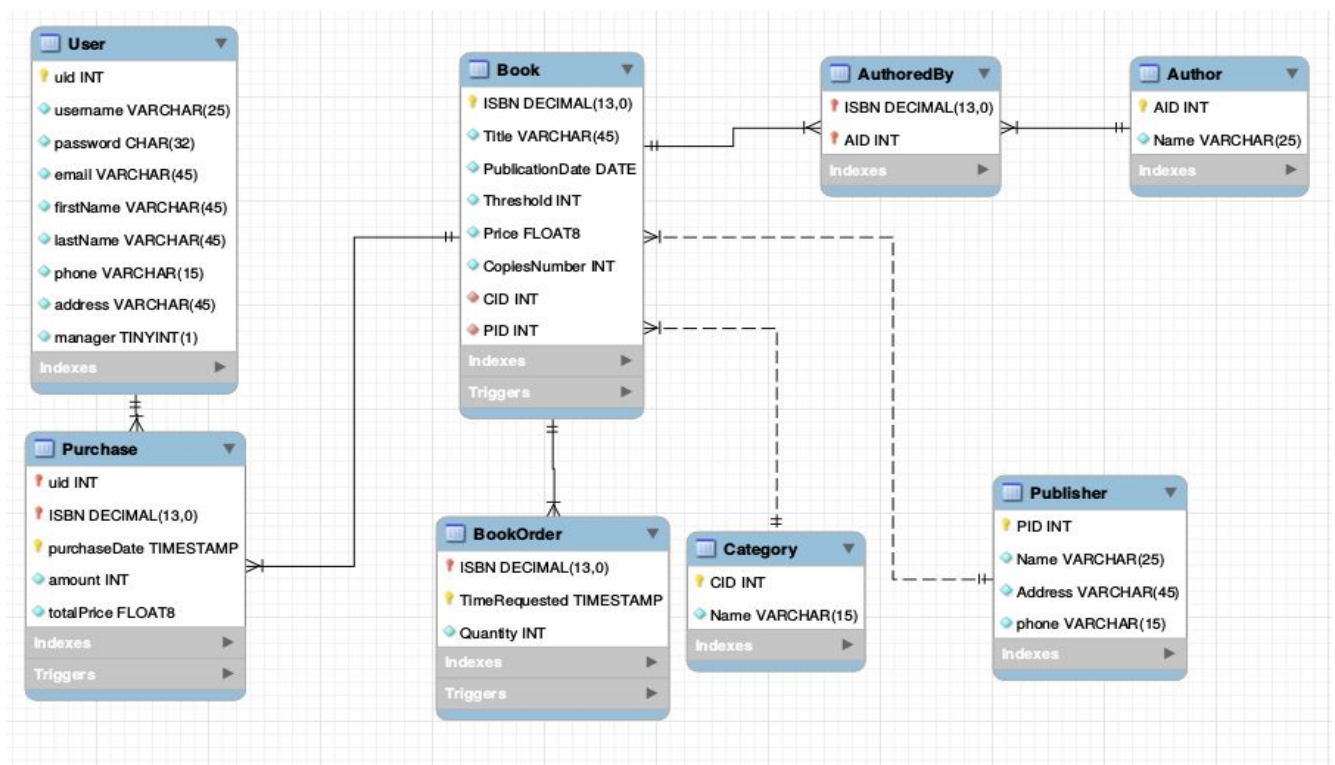
Team

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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

[Home](#) [Login](#) [Register](#)

Login Page

Username

Password

[Log In](#)

Online Book Store

Welcome

Username:

Password:

[Login](#)

[Signup](#)

○ Sign up

Home Login Register

Registration Page

First Name

Enter First Name

Last Name

Enter Last Name

Username

Enter Username

Password

Enter Password

Repeat Password

Repeat Password

Email

Enter Email

Phone

Enter Phone Number

Shipping Address

Enter Shipping Address

Sign Up

Online Book Store

Registration

*First Name	*Last Name
<input type="text"/>	<input type="text"/>
*Username	*Email
<input type="text"/>	<input type="text"/>
*Password	*Confirm Password
<input type="text"/>	<input type="text"/>
*Phone	*Shipping Address
<input type="text"/>	<input type="text"/>
Back	Submit

○ 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](#)

Online Book Store

Edit Profile

Cart

Log out

Price

Title:

Category:

ISBN:

☐ Publication Date:

Publisher:

Min:

15/05/2018

Max:

Authors:

Search

ISBN	Title	Category	PublicationDate	Price	Publisher	Add to Cart

Page: 1 Of 1

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>

○ 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 separated 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

Online Book Store

Edit Profile

Cart

Log out

Price

Min: 20.5

Max: 100.5

Title:

Category:

Romance

ISBN:

Publication Date:

15/04/2018

Publisher:

amr

Authors:

Search

ISBN	Title	Category	PublicationDate	Price	Publisher	Add to Cart
0	hello world	Romance	May 9, 2018	20.5	amr	Add to Cart
5	hello world 5	Romance	May 9, 2018	20.8	amr	Add to Cart
15	hello world 15	Romance	Apr 29, 2018	75.262	amr	Add to Cart
16	hello world 16	Romance	Apr 28, 2018	33.971	amr	Add to Cart
18	hello world 18	Romance	Apr 26, 2018	91.48	amr	Add to Cart
19	hello world 19	Romance	Apr 25, 2018	46.975	amr	Add to Cart
33	hello world 33	Romance	Apr 11, 2018	79.949	amr	Add to Cart
34	hello world 34	Romance	Apr 10, 2018	84.597	amr	Add to Cart
39	hello world 39	Romance	Apr 5, 2018	22.555	amr	Add to Cart
43	hello world 43	Romance	Apr 1, 2018	23.607	amr	Add to Cart

Page: 1 Of 10100

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10/100996

>

- Search view for Manager side

Home

Manager

User

Logout

Options

Books

Authors

Publishers

Categories

Orders

Users

Reports

Search Books

Add Book

Edit Book

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 separated by ;

Min Threshold :

Enter Min Threshold

Max Threshold :

Enter Max Threshold

Min Copies Number :

Enter Min Number

Max Copies Number :

Enter Max Number

Show: 5

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

Online Book Store

En

(34%)

11:48

Online Book Store

Edit Profile

Cart

Promote User

Reports

Orders

Log out

Price

Title:

Category:

ISBN:

☐ Publication Date:

Publisher:

Min:

15/05/2018

Max:

Authors:

Author

Add

Search

ISBN	Title	Category	PublicationDate	Price	Publisher	Modify	Add to Cart

Page: 1 Of 1

<

0/0

>

○ 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: 5 ▾

ISBN	Title	Price	In Stock	Copies	Total Price
11	enlistments clap woefully	36.592167	119	3	109.776505
2	armament officiate nicely	287.0731	40	1	287.0731

Showing 2 of 2 records

Pages: Previous **1** Next

Online Book Store
Wi-Fi
En
Bluetooth
Mail
Battery (100%)
Volume
6:51
Settings

My Cart

[To Checkout](#)
[Back](#)

Total Price: 237.83298 [Clear Cart](#)

ISBN	Title	Price	In Stock	Copies	Total Item Price	
0	hello world	20.5	10	5	102.5	remove from Cart
39	hello world 39	22.555	33	6	135.333	remove from Cart

Page: 1 Of 1
[←](#)
2/2
[→](#)

○ Checkout view :

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

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

My Cart

To Cart

Confirm Purchase




Total price : 396.8496 \$

Owner :

CVV :

Card Number :

Expiration Date :

Online Book Store

En

(100%)

6:52

Checkout

Purchase

To Cart

Total Price: 237.83298\$

Owner:

Card Number:

CVV:

Expiration Date:

* Card Number = 4716108999716531 CVV = 257 using visa to test form

○ Edit profile view :

Home

User

Logout

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

User

Logout

Options
Search
My Cart
Edit Profile
Change Password

Change Password

Old Password

Enter Old Password

New Password

Enter New Password

Repeat New Password

Repeat New Password

Change Password

Online Book Store

Edit Profile

First Name:

Last Name:

Username:

Email:

Phone:

Shipping Address:

Change Password

Old Password:

New Password:

Confirm Password:

Edit Profile **Back**

○ Manager promote user view

Home **Manager** User Logout

Options

- Books
- Authors
- Publishers
- Categories
- Orders
- Users**
- Reports

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	Promote User
amro	amro	amro	amro@amro.com	0123123	amro amro amro	Promote User
mico	mico	mico	mico@mico.com	011111111	mico mico mico	Promote User
maro	maro	maro	maro@maro.com	044444	maro maro maro	Promote User
groot	groot	groot	groot@groot.com	014123124	i am groot	Promote User

Showing 5 of 5 records

Pages: Previous **1** Next

Online Book Store

Promote User

Username:

Email:

○ Manager add author view

Authors

Search Authors	Add Author	Edit Author
----------------	------------	-------------

Author Name :

Online Book Store

Add Author

Author Name

○ Manager add publisher view

Home **Manager** User Logout

Options
Books
Authors
Publishers
Categories
Orders
Users
Reports

Publishers

Search Publishers **Add Publisher** Edit Publisher

Publisher Name : **Address :**

Phone :

Online Book Store Wi-Fi En 📧 🔋 (100%) 🔊 🌐 7:11

Add Publisher

Publisher Name:

Phone:

Address:

○ Manager add order view :

Home **Manager** User Logout

Options
Books
Authors
Publishers
Categories
Orders
Users
Reports

Orders

ISBN: Quantity:

Online Book Store Wi-Fi En 📧 🔋 (100%) 🔊 7:12 ⚙️

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 : Title :

Price : Threshold :

Category : Publisher :

Publication Date : Authors :

Available Copies :

Online Book Store

Add Book

ISBN	<input type="text"/>	Title	<input type="text"/>
Authors	<input type="text"/>	Price	<input type="text"/>
Publisher	<input type="text"/>	Publication Date	<input type="text" value="15/05/2018"/>
Category	<input type="text"/>	Threshold	<input type="text" value="1"/>
No Of Copies	<input type="text" value="1"/>		

○ Manager edit book view :

Home **Manager** User Logout

Options

- Books**
- Authors
- Publishers
- Categories
- Orders
- Users
- Reports

Books

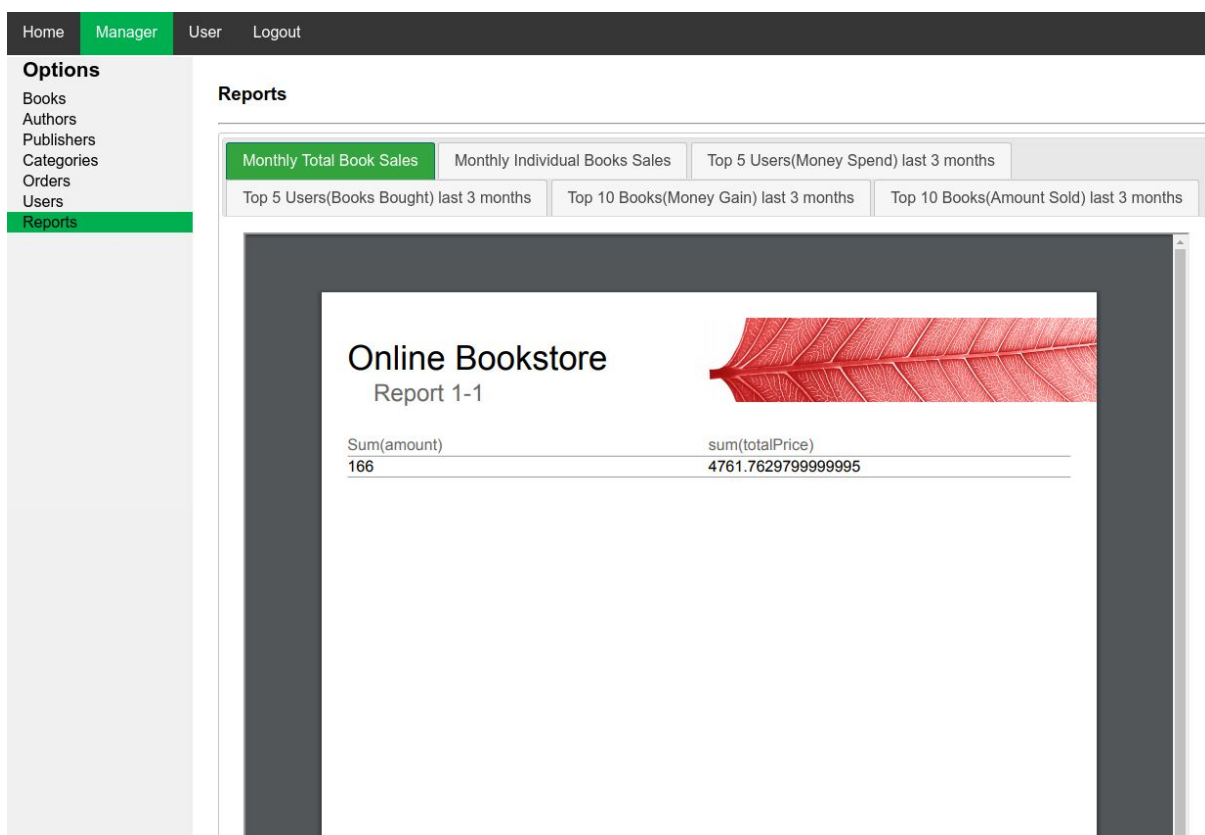
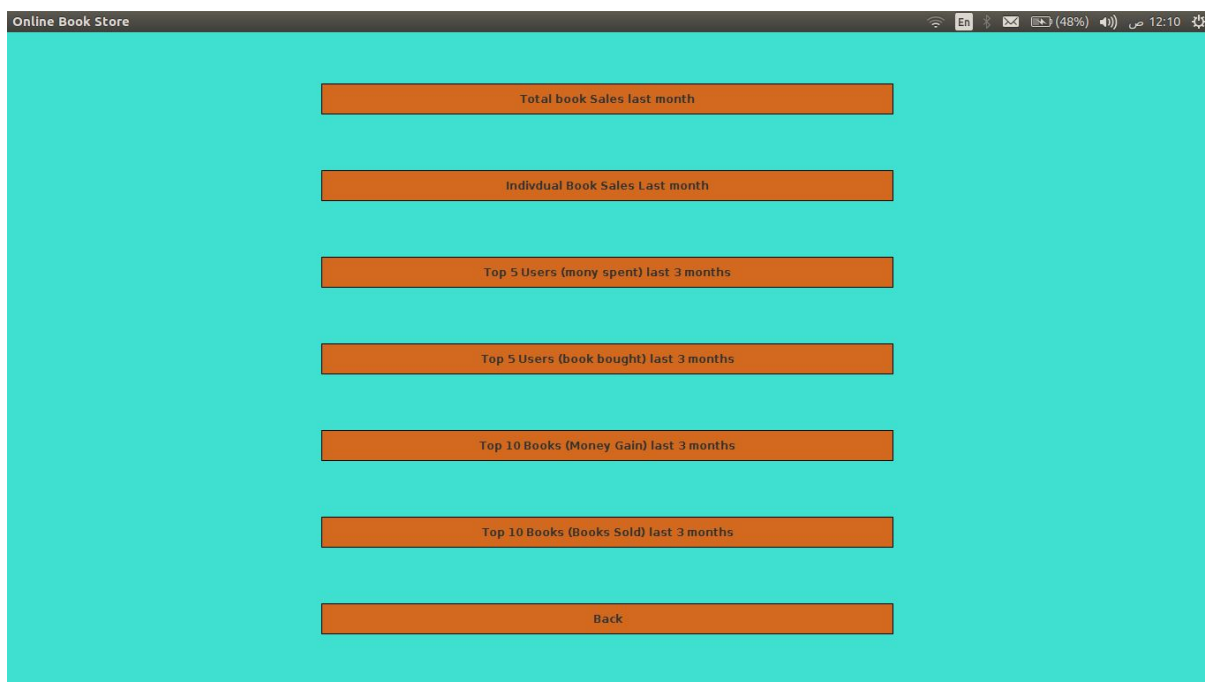
Old ISBN :	<input type="text" value="0"/>	ISBN :	<input type="text" value="0"/>
Title :	<input type="text" value="expansion project neve"/>	Price :	<input type="text" value="958.2169"/>
Category :	<input type="text" value="History"/>	Publisher :	<input type="text" value="Kitty Tisha Timi"/>
Publication Date :	<input type="text" value="10/15/673"/>	Authors :	<input type="text" value="Larisa Aila Genvieve,Darcey Orelie Gisella,Caril Nadine"/>
Threshold :	<input type="text" value="90"/>	Available Copies :	<input type="text" value="59"/>

Online Book Store

Edit Book

ISBN:	<input type="text" value="5"/>	Title:	<input type="text" value="hello world 5"/>
Authors:	<input type="text"/>	Price:	<input type="text" value="20.79994"/>
Publisher:	<input type="text" value="amr"/>	Publication Date:	<input type="text" value="09/05/2018"/>
Category:	<input type="text" value="Romance"/>	Threshold	<input type="text" value="10"/>
No Of Copies	<input type="text" value="13"/>		

○ Report View



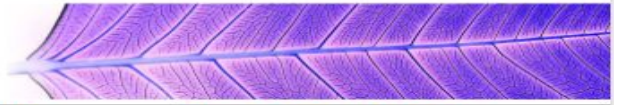
○ Jasper Report Example

Online Bookstore			
Report 3 - 1			
isbn	title	Sum(amount)	sum(totalPrice)
170297	swims order selfishly	12	2583.9233
0	expansion project never	1	958.2169
15	swivel hope yearly	1	822.15967
25	coupling hit questionably	1	272.41382
6876	windlasses damage	100	67.36632
11	enlistments clap woefully	1	36.592167
405	eggs concern thoughtfully	50	21.090803

Online Bookstore			
Report 1-2			
isbn	title	Sum(amount)	sum(totalPrice)
0	hello world	5	102.5
1	bye world	1	30.8
2	hello world 2	15	2918.06490000000003
5	hello world 5	10	207.9994
39	hello world 39	6	135.33296

Online Bookstore

Report 2 - 1



ISBN	Title	Sum of amounts	Sum of total prices
0	hello world	5	102.5

Online Bookstore

Report 3 - 2

isbn	title	Sum(amount)	sum(totalPrice)
2	hello world 2	15	2918.06490000000003
5	hello world 5	10	207.9994
39	hello world 39	6	135.33296
0	hello world	5	102.5
1	bye world	1	30.8