



جامعة بيروت العربية  
BEIRUT ARAB UNIVERSITY

CMPS342 - Database Systems

Faculty of Science

Dept. of Mathematics and Computer Science

[WWW.ONLINELIBRARYSYSTEM.SOMEE.COM](http://WWW.ONLINELIBRARYSYSTEM.SOMEE.COM)

# Online Library System

*Presented to:*

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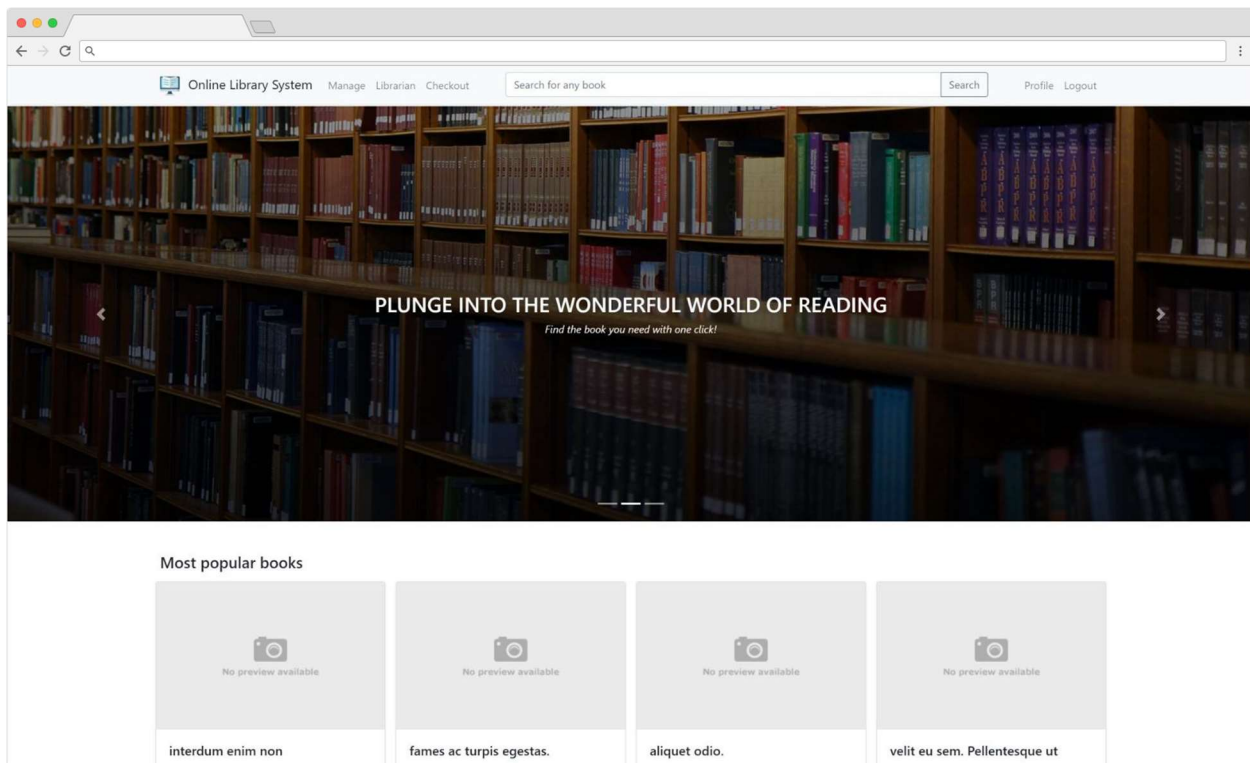
**Abdelrahman Daher**

## Pages Description

### Home Page

This page provides a nice welcome screen to the user, showing him some of the most popular books so he can interact and easily learn how to use the website.

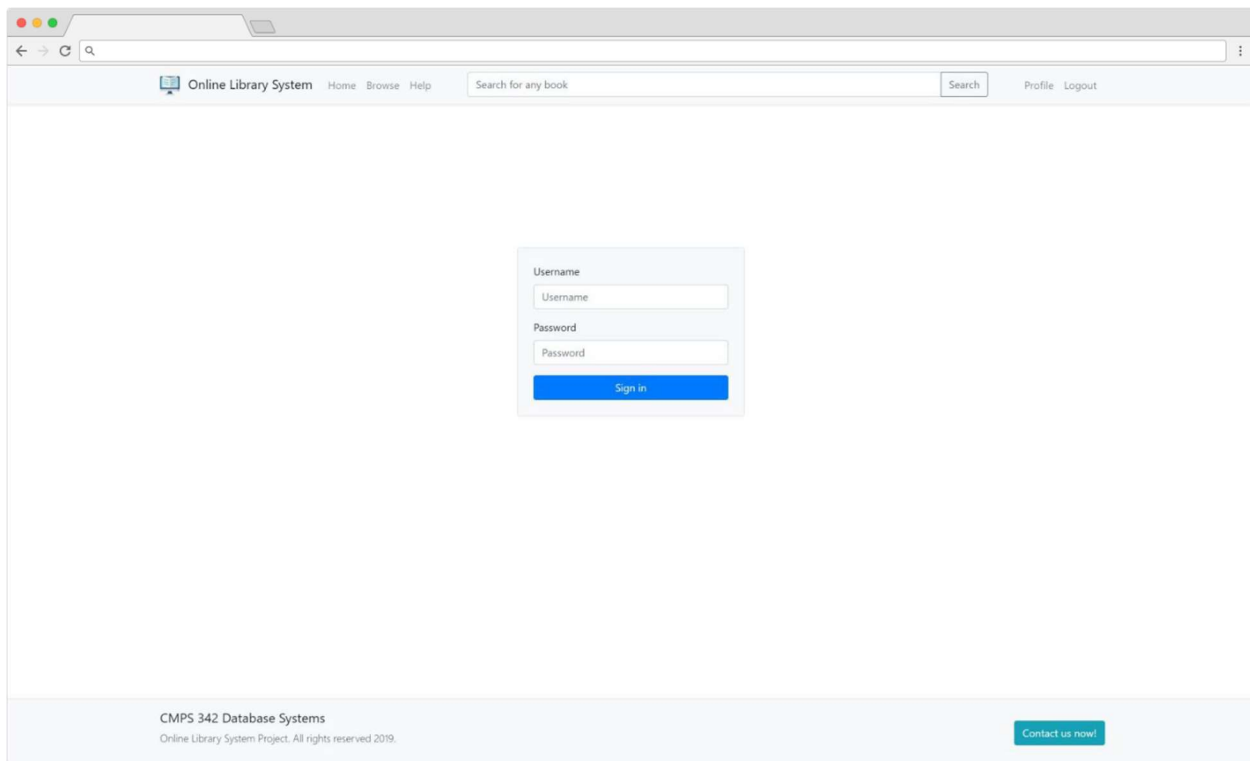
Page Title	Online Library   Home Page
Allowed Users	Guest
Path	~/Home/Index
MVC View Path	~/Views/Home/Index.cshtml
JavaScript	~/Scripts/home.js



## Login Page

This page presents to the user a simple form that require him to enter his username and password to login.

Page Title	Online Library   Login
Allowed Users	Guest
Path	~/Account/Login
MVC View Path	~/Views/Account/Login.cshtml
JavaScript	N/A



The screenshot shows a web browser window displaying the 'Online Library System' login page. The browser's address bar is empty, and the page title is 'Online Library System'. The navigation bar includes links for 'Home', 'Browse', and 'Help', along with a search bar labeled 'Search for any book' and buttons for 'Search', 'Profile', and 'Logout'. The main content area features a login form with two input fields: 'Username' and 'Password', each with a placeholder text. Below the fields is a blue 'Sign in' button. The footer contains the text 'CMPS 342 Database Systems' and 'Online Library System Project. All rights reserved 2019.', along with a 'Contact us now!' button.

Online Library System | Home | Browse | Help | Search for any book | Search | Profile | Logout

Username  
Username

Password  
Password

Sign in

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Contact us now!

## Sign-Up Page

The sign-up page allows students to sign up for an account to be able to rent books.

Page Title	Online Library   Signup
Allowed Users	Guest
Path	~/Account/Signup
MVC View Path	~/Views/Account/Signup.cshtml
JavaScript	N/A

The screenshot shows a web browser window displaying the 'Online Library System' sign-up page. The browser's address bar shows the URL 'Online Library System'. The page has a light blue header with navigation links: 'Home', 'Browse', 'Help', 'Search for any book', 'Search', 'Profile', and 'Logout'. The main content area is white and features a central sign-up form. The form has three input fields: 'Username' (with a hint 'Username should be at least 4 characters'), 'Password' (with a hint 'Password should be at least 6 characters'), and 'Re-enter Password'. Below these fields is a blue 'Sign up' button. The footer is light blue and contains the text 'CMPS 342 Database Systems' and 'Online Library System Project. All rights reserved 2019.' on the left, and a 'Contact us now!' button on the right.

Online Library System | Signup

Username

Username

Username should be at least 4 characters

Password

Password

Password should be at least 6 characters

Re-enter Password

Re-enter Password

Sign up

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## Search Page

This page provides the user with a very detailed but rather easy to use interface to search across a huge database of books.

Page Title	Online Library   Search
Allowed Users	Guest
Path	~/Book/Search
MVC View Path	~/Views/Book/Search.cshtml
JavaScript	N/A

Online Library System Manage Librarian Checkout Search for any book Search Profile Logout

What are you searching for? Search by Published between

Match entire string Search for any book Search Book title Most Popular 0 and 2020

We found 100 books matching your search!

**interdum enim non • mollis. Duis** \$ 7.45  
orci. Ut semper  
elit erat vitae risus. Duis a mi fringilla mi lacinia mattis. Integer eu lacus. Quisque imperdiet, erat nonummy ultricies ornare, elit elit fermentum risus, at fringilla purus mauris a nunc. In at pede. Cras vulputate velit eu  
Details Rent now

**fames ac turpis egestas. • felis eget** \$ 12.71  
Quisque ornare  
metus urna convallis erat, eget tincidunt dui augue eu tellus. Phasellus elit pede, malesuada vel, venenatis vel, faucibus id, libero. Donec consectetuer mauris id sapien. Cras dolor dolor, tempus non, lacinia at, iaculis quis, pede. Praesent eu dui. Cum sociis natoque penatibus et magnis dis parturient montes, nascetur ridiculus mus. Aenean eget magna. Suspendisse tristique neque venenatis lacus. Etiam bibendum fermentum metus. Aenean sed pede nec ante blandit viverra. Donec tempus, lorem fringilla ornare placerat, orci lacus vestibulum lorem, sit amet ultricies sem magna nec quam. Curabitur vel lectus. Cum sociis natoque penatibus et magnis dis parturient montes,  
Details Rent now

**aliquet odio. • senectus et** \$ 14.33  
non, bibendum  
Quisque nonummy ipsum non arcu. Vivamus sit amet risus. Donec egestas. Aliquam nec enim. Nunc ut erat. Sed nunc est, mollis non, cursus non, egestas a, dui. Cras pellentesque. Sed dictum. Proin eget odio. Aliquam vulputate ullamcorper magna. Sed eu eros.  
Details Rent now

**velit eu sem. Pellentesque ut • interdum. Nunc** \$ 3.67  
in molestie  
eget ipsum. Suspendisse sagittis. Nullam vitae diam. Proin dolor. Nulla semper tellus id nunc interdum feugiat. Sed nec metus facilisis lorem tristique aliquet. Phasellus

## Book Page

This page shows a detailed description of a book, with popup dialog that shows up when the user clicks on the rent button. The pickup date of a book should be provided so the user can rent it.

Page Title	Online Library   \${BookTitle}
Allowed Users	Guest (only students or higher roles can rent)
Path	~/Book/Index
MVC View Path	~/Views/Book/Index.cshtml
JavaScript	N/A

The screenshot shows a web browser window with the 'Online Library System' header. The main content area displays a book titled 'interdum enim non' by 'mollis. Duis' for \$7.45. A 'Rent - 46 copy(s) available' button is visible. Below the book title is a 'Book Description' section with placeholder text. An 'Additional details' table lists book information. The footer includes 'CMPS 342 Database Systems' and a 'Contact us now!' button.

Info	Values
Title	interdum enim non
Author	mollis. Duis
Published on	02/12/1950
Publisher	orci. Ut semper
Copies available	46
Availability	Available

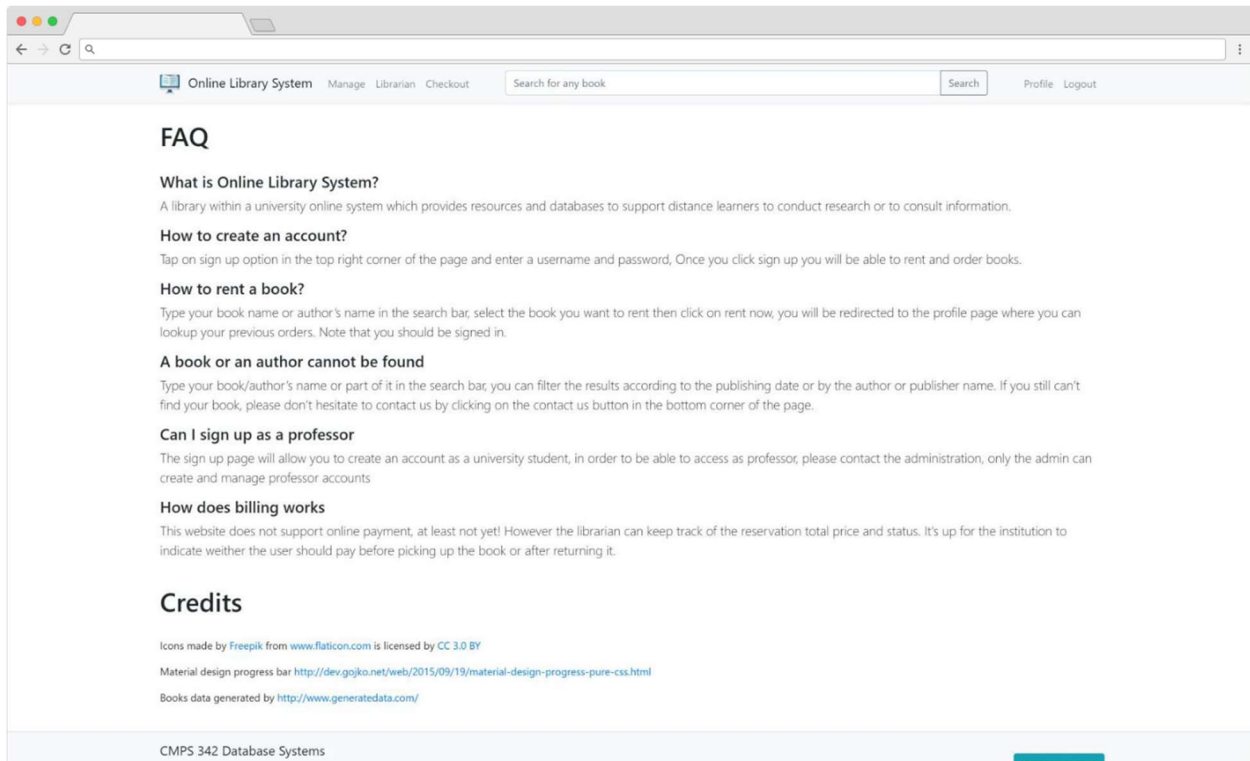
The screenshot shows the 'Rent this book' popup dialog overlaid on the book page. The dialog contains the book's title, author, publisher, and price. It includes a 'Pickup this book on' date field set to '05/14/2019' and a return date of '05/28/2019'. 'Confirm' and 'Cancel' buttons are at the bottom.

<b>Book Title</b>	interdum enim non
<b>Author Name</b>	mollis. Duis
<b>Publisher Name</b>	orci. Ut semper
<b>Book Price</b>	\$7.45
<b>Pickup this book on</b>	05/14/2019
You should return this book before 05/28/2019	

## Help Page

This page provides some FAQs (Frequently asked questions) and credits.

Page Title	Online Library   Help
Allowed Users	Guest
Path	~/Book/Help
MVC View Path	~/Views/Help/Index.cshtml
JavaScript	~/Scripts/help.js



The screenshot shows a web browser window displaying the 'FAQ' page of the 'Online Library System'. The browser's address bar is empty, and the page title is 'Online Library System'. The navigation bar includes links for 'Manage', 'Librarian', and 'Checkout', along with a search bar labeled 'Search for any book' and buttons for 'Search', 'Profile', and 'Logout'. The main content area is titled 'FAQ' and contains several sections: 'What is Online Library System?' (describing the system's purpose), 'How to create an account?' (explaining the sign-up process), 'How to rent a book?' (detailing the rental steps), 'A book or an author cannot be found' (providing search tips), 'Can I sign up as a professor' (explaining the process for professors), and 'How does billing works' (stating that online payment is not supported). Below the FAQ sections is a 'Credits' section acknowledging icons from Freepik, material design progress bar from dev.gajko.net, and books data from generatedata.com. The footer of the page displays 'CMPS 342 Database Systems' and a 'Contact Us' button.

**FAQ**

**What is Online Library System?**  
A library within a university online system which provides resources and databases to support distance learners to conduct research or to consult information.

**How to create an account?**  
Tap on sign up option in the top right corner of the page and enter a username and password. Once you click sign up you will be able to rent and order books.

**How to rent a book?**  
Type your book name or author's name in the search bar, select the book you want to rent then click on rent now, you will be redirected to the profile page where you can lookup your previous orders. Note that you should be signed in.

**A book or an author cannot be found**  
Type your book/author's name or part of it in the search bar, you can filter the results according to the publishing date or by the author or publisher name. If you still can't find your book, please don't hesitate to contact us by clicking on the contact us button in the bottom corner of the page.

**Can I sign up as a professor**  
The sign up page will allow you to create an account as a university student, in order to be able to access as professor, please contact the administration, only the admin can create and manage professor accounts

**How does billing works**  
This website does not support online payment, at least not yet! However the librarian can keep track of the reservation total price and status. It's up for the institution to indicate whether the user should pay before picking up the book or after returning it.

**Credits**

Icons made by [Freepik](http://www.freepik.com) from [www.flaticon.com](http://www.flaticon.com) is licensed by CC 3.0 BY

Material design progress bar <http://dev.gajko.net/web/2015/09/19/material-design-progress-pure-css.html>

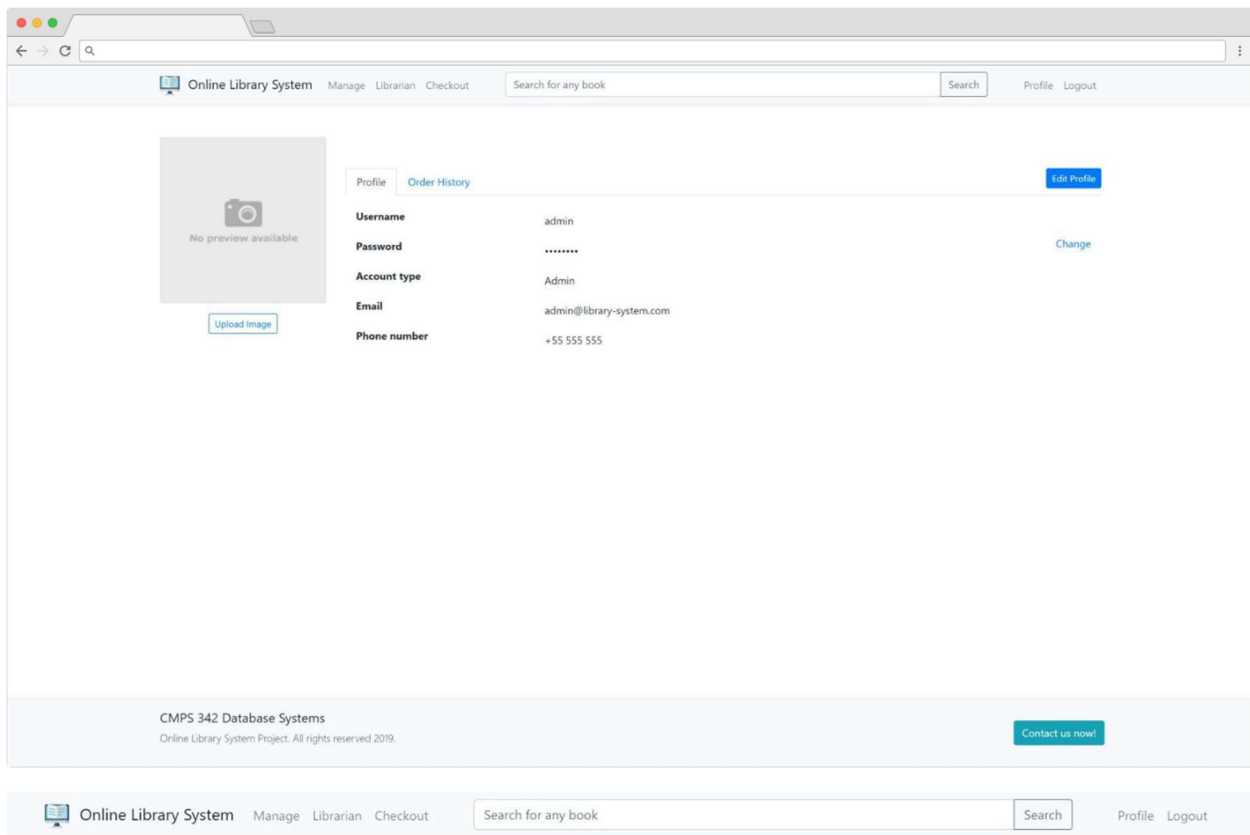
Books data generated by <http://www.generatedata.com/>

CMPS 342 Database Systems [Contact Us](#)

## Profile Page


A simple page allowing users to check and edit their profile information along with checking previously ordered books.

Page Title	Online Library   Profile
Allowed Users	Students or higher roles
Path	~/Account/Profile
MVC View Path	~/Views/Account/Profile.cshtml
JavaScript	~/Scripts/profile.js



The screenshot shows a web browser displaying the 'Online Library System' profile page. The page has a light blue header with navigation links: 'Manage', 'Librarian', and 'Checkout'. A search bar is present with the placeholder text 'Search for any book'. The main content area is divided into two tabs: 'Profile' (selected) and 'Order History'. The 'Profile' tab displays a user profile for 'admin' with fields for Username, Password, Account type, Email, and Phone number. There is an 'Upload Image' button next to a placeholder for a profile picture. A footer section contains the text 'CMPS 342 Database Systems' and 'Online Library System Project. All rights reserved 2019.'.

Online Library System		Manage	Librarian	Checkout	Search for any book	Search	Profile	Logout
-----------------------	--	--------	-----------	----------	---------------------	--------	---------	--------



Upload Image

Profile

Order History

Edit Profile

Username

admin

Password

\*\*\*\*\*

Change

Account type

Admin

Email

admin@library-system.com

Phone number

+55 555 555

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Contact us now!

Camera icon

No preview available

Upload Image

Profile

Order History

Edit Profile

interdum enim non

Ordered on: 05/14/2019 Pickup date: 05/14/2019 Return date: 05/28/2019 Book price: \$ 7.45

rented

interdum enim non

Ordered on: 05/14/2019 Pickup date: 05/14/2019 Return date: 05/28/2019 Book price: \$ 7.45

rented

interdum enim non

Ordered on: 04/30/2019 Pickup date: 04/30/2019 Return date: 05/14/2019 Book price: \$ 7.45

ready

fames ac turpis egestas.

Ordered on: 04/30/2019 Pickup date: 04/30/2019 Return date: 05/14/2019 Book price: \$ 12.71

late



## Change Password Page

This page allows users to modify their password securely.

Page Title	Online Library   Change Password
Allowed Users	Guest
Path	~/Account/ChangePassword
MVC View Path	~/Views/Account/ChangePassword.cshtml
JavaScript	N/A

The screenshot shows a web browser window displaying the 'Change Password' page of an 'Online Library System'. The browser's address bar shows the URL 'Online Library System'. The page has a light blue header with navigation links: 'Manage', 'Librarian', and 'Checkout'. A search bar with the placeholder text 'Search for any book' and a 'Search' button is located in the header. The main content area contains three password input fields: 'Old Password', 'New Password', and 'Confirm new Password'. Below the 'New Password' field, there is a note: 'Password should be at least 6 characters'. Below the 'Confirm new Password' field, there is a note: 'Make sure your passwords are matching'. A blue 'Submit' button is located below the 'Confirm new Password' field. The footer of the page contains the text 'CMPS 342 Database Systems' and 'Online Library System Project. All rights reserved 2019.' on the left, and a 'Contact us now!' button on the right.

Online Library System | Manage Librarian Checkout | Search for any book | Search | Profile Logout

Old Password

New Password

Password should be at least 6 characters

Confirm new Password

Make sure your passwords are matching

[Submit](#)

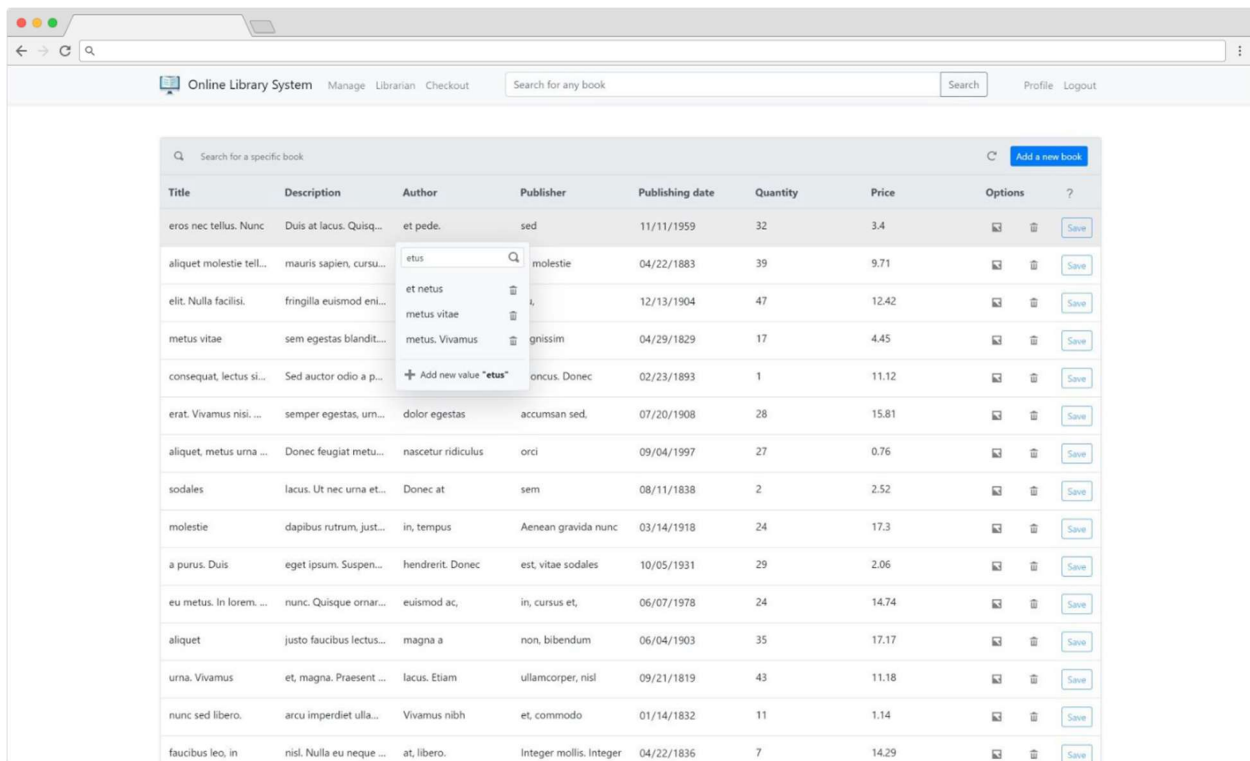
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[Contact us now!](#)

## Librarian Page

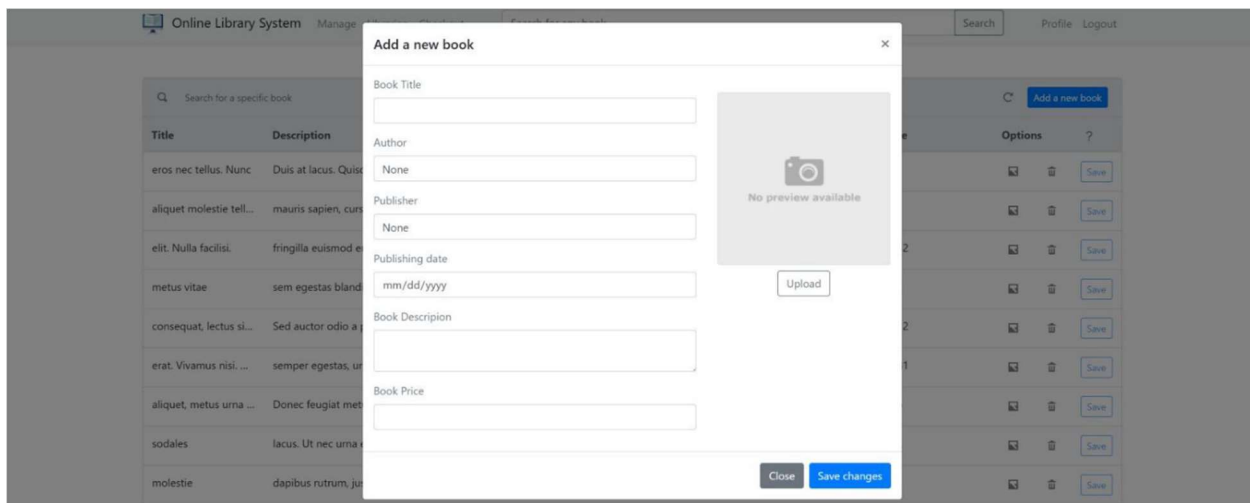
A compact interface is provided for the librarian to modify and add books very easily, he can also search by typing a books name. Adding and removing authors and publishers is also a very easy operation.

Page Title	Online Library   Librarian
Allowed Users	Librarians or higher roles
Path	~/Librarian/Index
MVC View Path	~/Views/Librarian/Index.cshtml
JavaScript	~/Scripts/librarian.js



The screenshot shows the 'Online Library System' interface for a Librarian. At the top, there's a navigation bar with 'Manage', 'Librarian', and 'Checkout' tabs, a search bar, and 'Search', 'Profile', and 'Logout' links. Below this is a table of books with columns: Title, Description, Author, Publisher, Publishing date, Quantity, Price, Options, and a question mark icon. A search dropdown is open over the 'Author' column, showing suggestions: 'etus', 'et netus', 'metus vitae', and 'metus. Vivamus'. The table contains 20 rows of book data.

Title	Description	Author	Publisher	Publishing date	Quantity	Price	Options	?
eros nec tellus. Nunc	Duis at lacus. Quisq...	et pede.	sed	11/11/1959	32	3.4		<a href="#">Save</a>
aliquet molestie tell...	mauris sapien, cursu...	etus	molestie	04/22/1883	39	9.71		<a href="#">Save</a>
elit. Nulla facilisi.	fringilla euismod eni...	et netus		12/13/1904	47	12.42		<a href="#">Save</a>
metus vitae	sem egestas blandit...	metus vitae		04/29/1829	17	4.45		<a href="#">Save</a>
consequat, lectus si...	Sed auctor odio a p...	metus. Vivamus	gnissim	02/23/1893	1	11.12		<a href="#">Save</a>
erat. Vivamus nisi ...	semper egestas, urn...	dolor egestas	accumsan sed,	07/20/1908	28	15.81		<a href="#">Save</a>
aliquet, metus urna ...	Donec feugiat metu...	nascetur ridiculus	orci	09/04/1997	27	0.76		<a href="#">Save</a>
sodales	lacus. Ut nec urna et...	Donec at	sem	08/11/1838	2	2.52		<a href="#">Save</a>
molestie	dapibus rutrum, just...	in, tempus	Aenean gravida nunc	03/14/1918	24	17.3		<a href="#">Save</a>
a purus. Duis	eget ipsum. Suspen...	hendrerit. Donec	est, vitae sodales	10/05/1931	29	2.06		<a href="#">Save</a>
eu metus. In lorem ...	nunc. Quisque ornar...	euismod ac,	in, cursus et,	06/07/1978	24	14.74		<a href="#">Save</a>
aliquet	justo faucibus lectus...	magna a	non, bibendum	06/04/1903	35	17.17		<a href="#">Save</a>
urna. Vivamus	et, magna. Praesent ...	lacus. Etiam	ullamcorper, nisi	09/21/1819	43	11.18		<a href="#">Save</a>
nunc sed libero.	arcu imperdiet ulla...	Vivamus nibh	et, commodo	01/14/1832	11	1.14		<a href="#">Save</a>
faucibus leo, in	nisi. Nulla eu neque ...	at, libero.	Integer mollis. Integer	04/22/1836	7	14.29		<a href="#">Save</a>



The screenshot shows the 'Add a new book' modal form. It has a title bar with a close button. The form contains the following fields: 'Book Title' (text input), 'Author' (text input with 'None' selected), 'Publisher' (text input with 'None' selected), 'Publishing date' (text input with placeholder 'mm/dd/yyyy'), 'Book Description' (text area), and 'Book Price' (text input). There is a 'No preview available' message with a camera icon and an 'Upload' button. At the bottom, there are 'Close' and 'Save changes' buttons.

Add a new book

Book Title

Author

None

Publisher

None

Publishing date

mm/dd/yyyy

Book Description

Book Price

No preview available

Upload

Close

Save changes

## Checkout Page

This librarian can confirm if a book was picked up or returned in this page, a warning sign will appear next to the late transactions.

Page Title	Online Library   Checkout
Allowed Users	Librarians or higher roles
Path	~/Librarian/Checkout
MVC View Path	~/Views/Librarian/Checkout.cshtml
JavaScript	~/Scripts/checkout.js

Online Library System

Manage Librarian Checkout

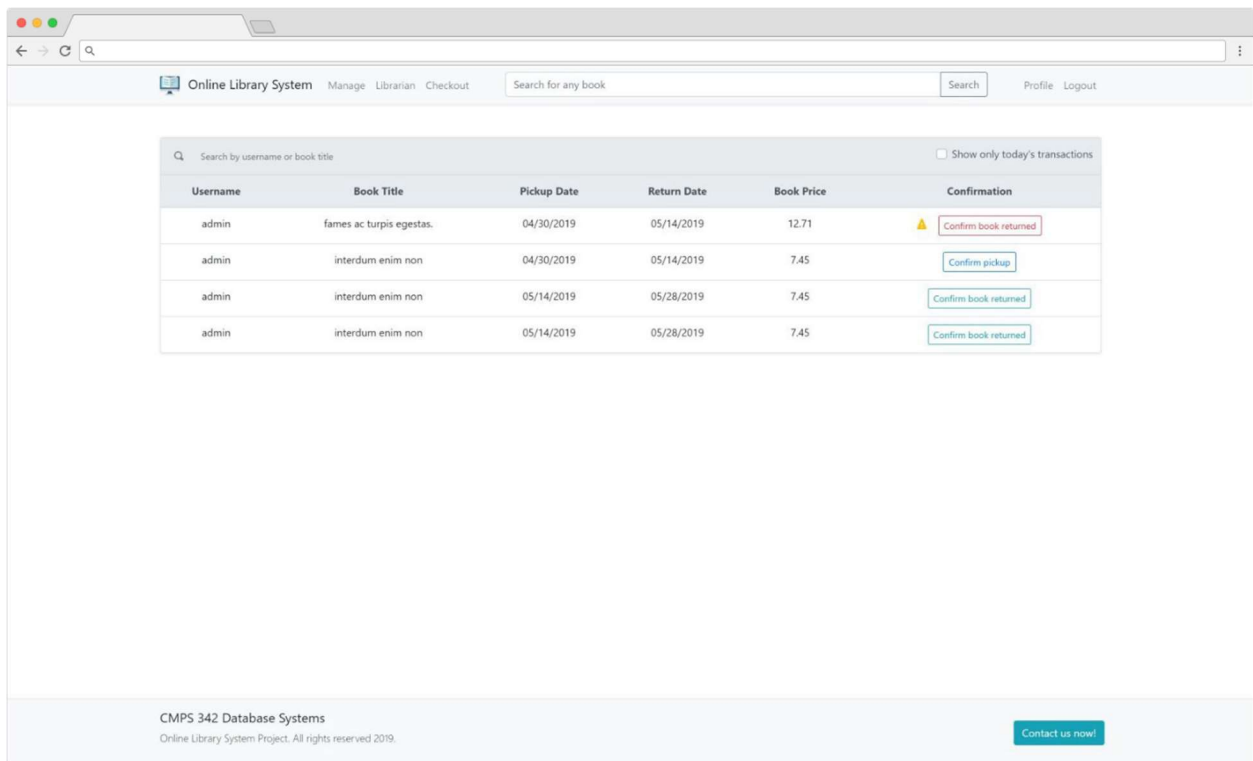
Search for any book

Search

Profile Logout

Search by username or book title

Show only today's transactions

Username	Book Title	Pickup Date	Return Date	Book Price	Confirmation
admin	fames ac turpis egestas.	04/30/2019	05/14/2019	12.71	 Confirm book returned
admin	interdum enim non	04/30/2019	05/14/2019	7.45	Confirm pickup
admin	interdum enim non	05/14/2019	05/28/2019	7.45	Confirm book returned
admin	interdum enim non	05/14/2019	05/28/2019	7.45	Confirm book returned

CMPS 342 Database Systems

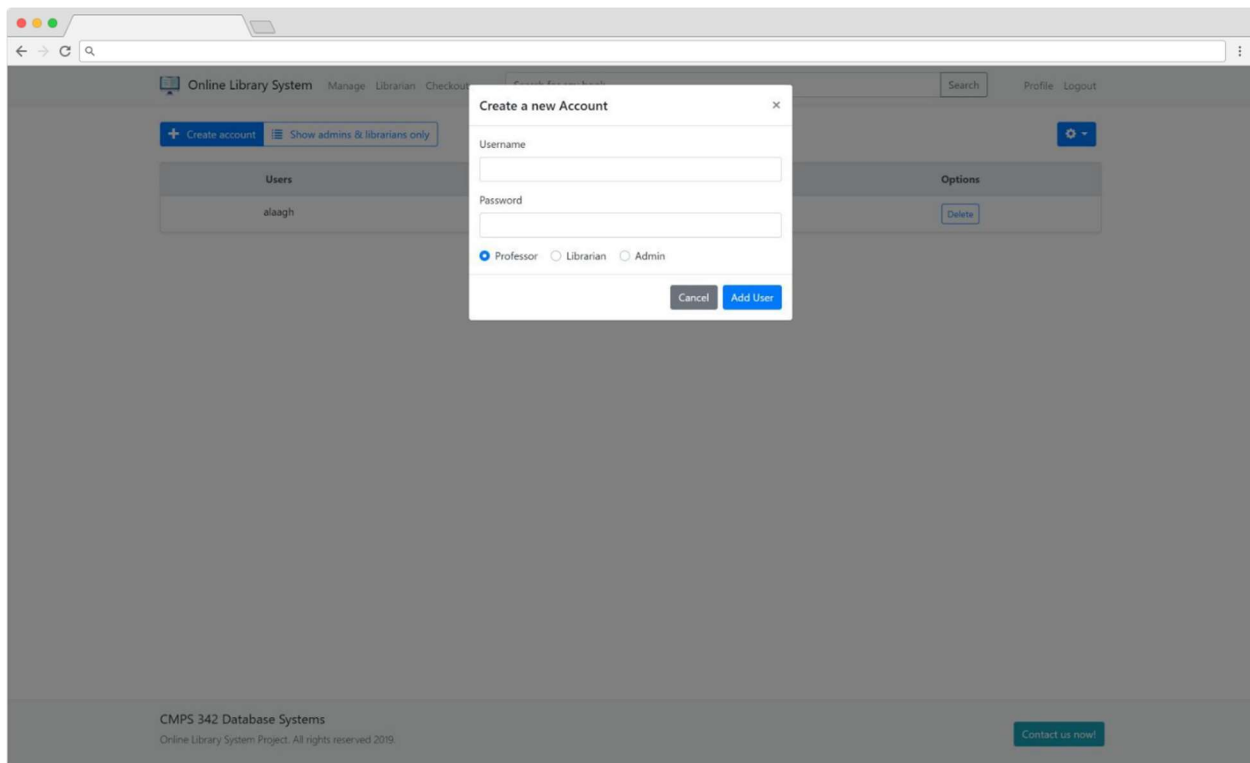
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Contact us now!

## Admin Page

Only admins can access this page, this page is used to add new staff (Professors, Librarians or Admins) or delete them (this will keep a copy of the data in the database, but the deleted user will not be able to login anymore).

Page Title	Online Library   Manage
Allowed Users	Admins
Path	~/Admin/Manage
MVC View Path	~/Views/Admin/Manage.cshtml
JavaScript	~/Scripts/checkout.js



## Brief explanation

### Technologies used

We decided to create this project using ASP.NET MVC, because of the design architecture that allow us to separate the backend from the frontend and make the project easily understood and modified. So now our code is nicely divided into “ApiController” classes and each class is divided into several methods or “actions”. The following are the controllers that can be found in [~/Controllers/](#) folder:

- **ApiBookController.cs**
  - All actions in this class are related to books.
  - The biggest class since most of our queries are related to books.
- **ApiAccountController.cs**
  - Actions that are related to users’ information.
- **ApiReservationController.cs**
  - Contains actions to checkout or check existing reservations.

The queries used inside those files are grouped in the file [ApiQueries.sql](#):

```
ApiQueries.sql x
10 -----
11 ----- API BOOK -----
12 -----
13
14 /* api/ApiBook/GetMostPopular */
15 SELECT TOP(@count) * FROM BookInfo LEFT OUTER JOIN (
16     SELECT BookId, COUNT(ReservationId) AS ReservationCount FROM Reservation GROUP BY BookId
17 ) AS Res ON BookInfo.BookId = Res.BookId ORDER BY ReservationCount DESC
18
19
20 /* api/ApiBook/Search */
21 SELECT * FROM (
22     SELECT ROW_NUMBER() OVER(ORDER BY _) AS[Row], BookInfo.* FROM BookInfo
23     LEFT OUTER JOIN(Select COUNT(BookId) AS[Count], BookId FROM Reservation GROUP BY BookId) AS Res
24     ON BookInfo.BookId = Res.BookId WHERE (BookTitle LIKE CONCAT('{3}',@key,'{3}') OR _=)
25     AND(AuthorName LIKE CONCAT('{3}',@key,'{3}') OR _=) AND (PublisherName LIKE CONCAT('{3}',@key,'{3}') OR _=)
26     AND (PublishingDate IS NULL OR YEAR(PublishingDate) BETWEEN @min AND @max)
27 ) AS Result WHERE[Row] BETWEEN @start AND @end
28
29
30 SELECT COUNT(*) FROM BookInfo LEFT OUTER JOIN(
31     Select COUNT(BookId) AS[Count], BookId FROM Reservation GROUP BY BookId) AS Res ON BookInfo.BookId = Res.BookId
32     WHERE (BookTitle LIKE CONCAT('{3}',@key,'{3}') OR _=) AND (AuthorName LIKE CONCAT('{3}',@key,'{3}') OR _=)
33     AND (PublisherName LIKE CONCAT('{3}',@key,'{3}') OR _=) AND (PublishingDate IS NULL OR YEAR(PublishingDate) BETWEEN @min AND @max
34 )
35
36 /* api/ApiBook/Get */
37 Select * FROM BookInfo WHERE BookId = @id
38
39
40 /* api/ApiBook/Rent */
41 INSERT INTO Reservation (BookId, PickupDate, ReturnDate, IsDone, PersonId, Quantity) VALUES(@bookId, @date, @retDate, 0, @personId, 1)
42
```

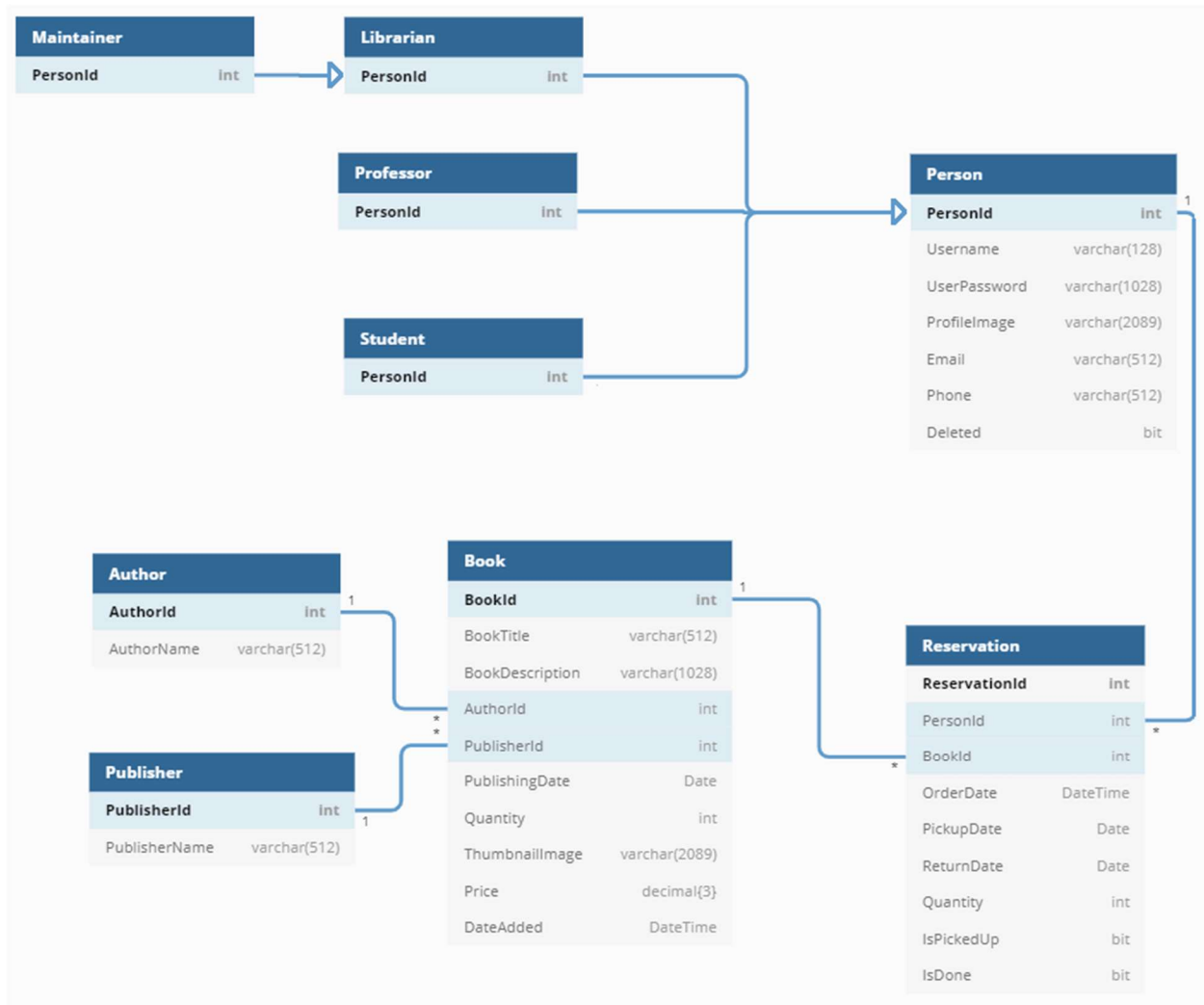
*This file is missing parameters marked as “\_”, running the script will cause errors.*

We also used other technology like angular, allowing us to divide our views into components without redundantly repeating codes.

▲ **Important:** For more details about the project setup please refer the [readme.md](#) file.

## Database Design

Here is our **Entity Relations Diagram**:



We've included all diagrams and SQL files inside the visual studio project folder [SqlScripts](#).

Our SQL files are split into a [DDL](#) and [DML](#) file to keep everything clean. And there's also an [MDF](#) file that can be copied and attached to SQL Server.

We made some design tweaks considering that in real world applications, requirements can change very often. That's why some tables are made of only one attribute, but only because extending that table and adding more attributes to it in the future is a must (e.g. we might need to store a specific information for professors that is not related to students so we might need to add that later that's why we kept the professor table separated, or maybe a maintainer can have a creator id which gives him specific permissions or restriction over other admins) but we kept things nice and easy for now!

### Additional Links

- Hosted project on **somee.com**: <http://www.onlinelibrarysystem.somee.com>
- Our **GitHub** repository: <https://github.com/omneimneh/online-library-system>
- Screenshots are located in the [screenshots](#) folder