UAB Bookstore online vendor system

Team members: Chenghui Song, Jiaxin Tian, Zhiying Lu, Qinglu Ren, Joe Chang, Dylan Li

<table>
<tr><td colspan="5">We declare that we have completed this assignment completely and entirely on our own, without any consultation with others. We have read the UAB Academic Honor Code and understand that any breach of the Honor Code may result in severe penalties.
We also declare that the following percentage distribution <b><i>faithfully</i></b> represents individual group members' contributions to the completion of the assignment</td></tr>
<tr><td>Name</td><td>Overall Contribution (%) (respectively)</td><td>Major work items completed by me</td><td>Signature or initials</td><td>Date</td></tr>
<tr><td>Zhiying Lu</td><td>20%</td><td>Final report
Add to cart and check out functions
Fix error in login for customer and manager.</td><td>ZL</td><td>8/3/2022</td></tr>
<tr><td>Qinglu Ren</td><td>20%</td><td>First version of the website, include buidling first version (not submitted version) of webframe, initial log in, sign up (no user authentication), second version: manager view (add book, show all book, show all customers, show all orders), updating book quantity, about us page. I did not do database, view all customers in customers, add cart, check out in second edition.</td><td>Qinglu Ren</td><td>8/3/2022</td></tr>
<tr><td>Chenghui Song</td><td>20%</td><td>Webframe, database, book listing, add to cart, check out</td><td>CS</td><td>8/3/2022</td></tr>
<tr><td>Jiaxin Tian</td><td>20%</td><td>Fixed manager view.
Class building.
Other assisting.</td><td>Jiaxin Tian</td><td>8/3/2022</td></tr>
<tr><td>Joe Chang</td><td>20%</td><td>Log in and sign up page, check the variable when user trying to sign up the account, if everything following the rule, import to database, if not correct, pop out error message.</td><td>JC</td><td>8/3/2022</td></tr>
<tr><td>Dylan Li</td><td>20%</td><td>Log in and sign up, build log-in and functionalities, adjusting the navigation bar of the website.</td><td>DL</td><td>8/3/2022</td></tr>
</table>

Introduction

The modern web was born in 1989 since Tim Berners-Lee invented World Wide Web. Web pages only contained text and tables at the beginning, and now can contain 3D video and living streams(1). Web technology has penetrated all aspects of our lives, including Online Banking, Social Networking, Online Reservations, eCommerce / Shopping Cart Applications, Interactive Games, Online Training, Online Polls, Blogs, Online Forums, Content Management Systems, etc (2). In the past ten years, with the rapid growth of smartphones and mobile devices, the web page has gradually evolved to accommodate the special screen size of these devices.

Generally speaking, Web development is to develop websites for hosting via intranet or internet. Based on the definition of Techopedia, Web development is the coding or programming that enables website functionality, per the owner's requirements (3). The process of web development generally includes web design, web content development, client-side/server-side scripting and network security configuration, among other tasks (3). The web development hierarchy includes Client-side coding, Server-side coding and Database technology. Hypertext Markup Language (HTML), Cascading Style Sheets (CSS), and JavaScript are the basic and fundamental tools used in web development. Nowadays, a few Web Application Frameworks have been developed to help developers to simplify the web development process.

In this project, we used flask to create a website for UAB bookstore. The functions include customer sign up, sign in, purchase book, sort book by category, add to cart, manager view in order history. The manager is able to add new book directly from the website and update price and quantity (stock number) from manager’s account. In addition, we create static HTML page to add store address, hour and embeded one youtube video (directly copied from youtube.com).

Technologies

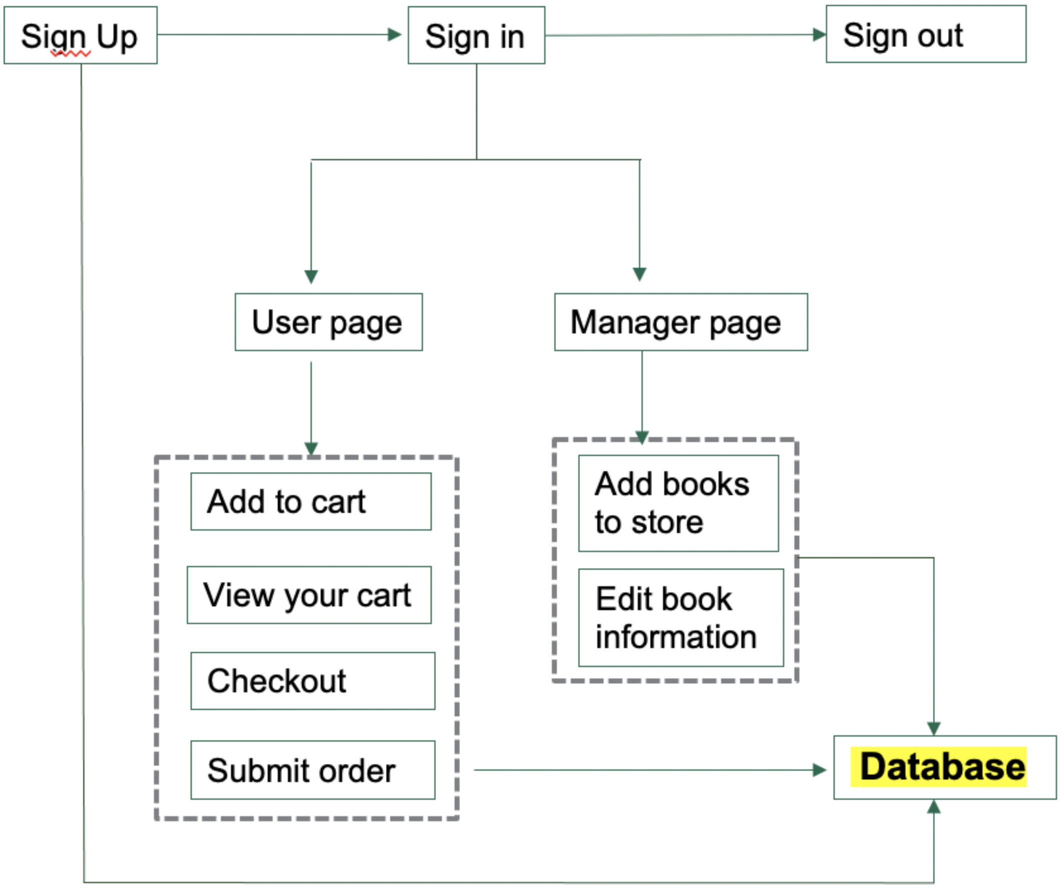
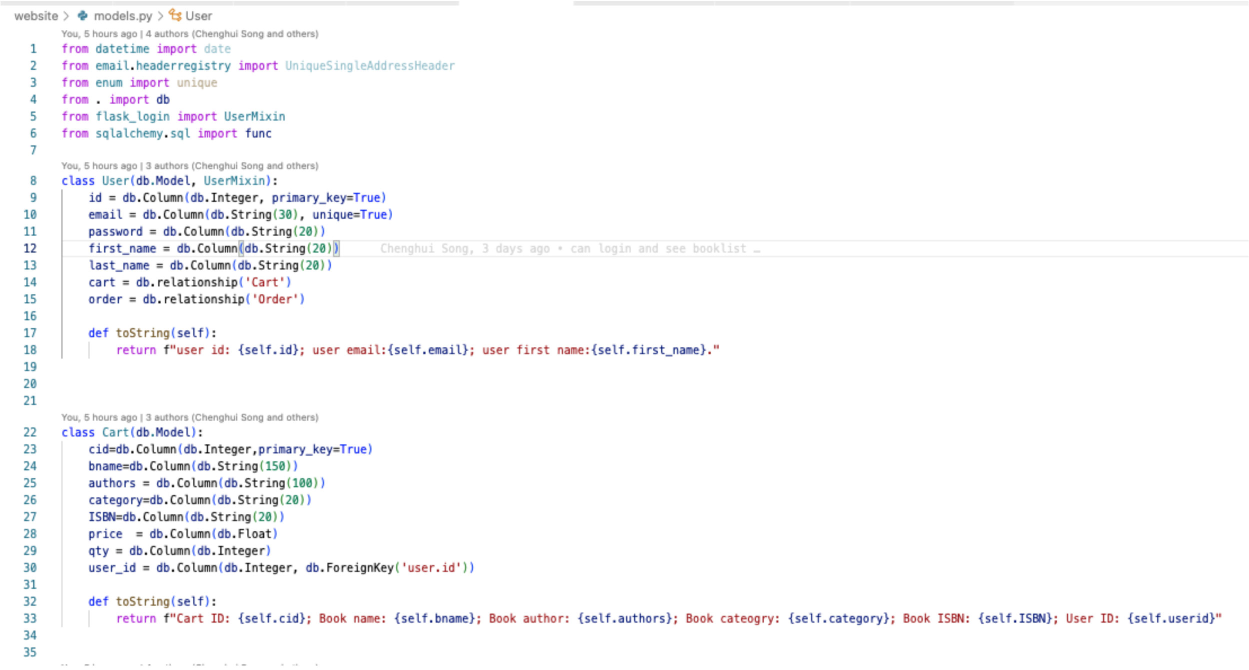


Fig. 1 How this system is designed

- **Back end**

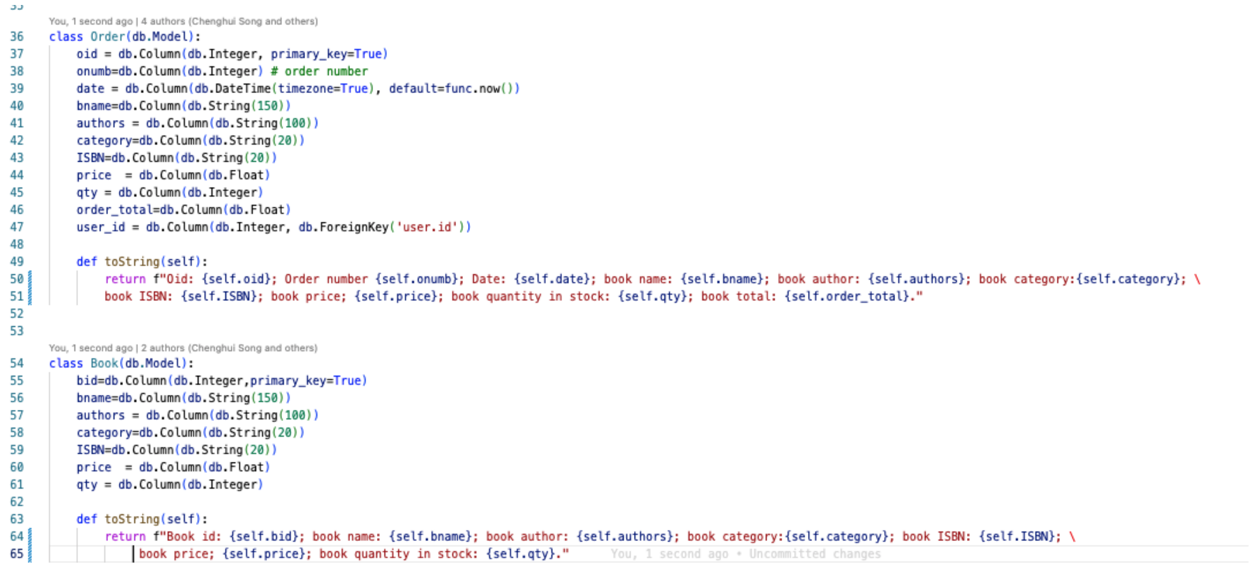
We used Python-based web framework Flask for the entire website design. SQLite and SQLAlchemy packages are used to build up database. We watched several youtube videos throughout the course to learn Flask and database. We choose SQLite and SQLAlchemy because of its ease-to-use. Jinja script to build on inheritance between websites to reduce coding burden. In our database design, five tables are created, including User, Book, Order, Cart, and Note to store users, book inventory, order information, shopping cart and order notification to store managers respectively. Using the user email as the primary key, we connect all the tables. Because there are several parts, making the main.py file very big, we write several modules and let main.py to call this modules. This make the app more managable and also a result of our team work.

Database design: a separate file called models.py is created for sqlite database certation.



website > models.py > User

```
You, 5 hours ago | 4 authors (Chenghui Song and others)
from datetime import date
from email.headerregistry import UniqueSingleAddressHeader
from enum import unique
from . import db
from flask_login import UserMixin
from sqlalchemy.sql import func

You, 5 hours ago | 3 authors (Chenghui Song and others)
class User(db.Model, UserMixin):
    id = db.Column(db.Integer, primary_key=True)
    email = db.Column(db.String(30), unique=True)
    password = db.Column(db.String(20))
    first_name = db.Column(db.String(20))      Chenghui Song, 3 days ago • can login and see booklist …
    last_name = db.Column(db.String(20))
    cart = db.relationship('Cart')
    order = db.relationship('Order')

    def toString(self):
        return f"user id: {self.id}; user email:{self.email}; user first name:{self.first_name}."



You, 5 hours ago | 3 authors (Chenghui Song and others)
class Cart(db.Model):
    cid=db.Column(db.Integer,primary_key=True)
    bname=db.Column(db.String(150))
    authors = db.Column(db.String(100))
    category=db.Column(db.String(20))
    ISBN=db.Column(db.String(20))
    price  = db.Column(db.Float)
    qty = db.Column(db.Integer)
    user_id = db.Column(db.Integer, db.ForeignKey('user.id'))

    def toString(self):
        return f"Cart ID: {self.cid}; Book name: {self.bname}; Book author: {self.authors}; Book cateogry: {self.category}; Book ISBN: {self.ISBN}; User ID: {self.userid}"

```



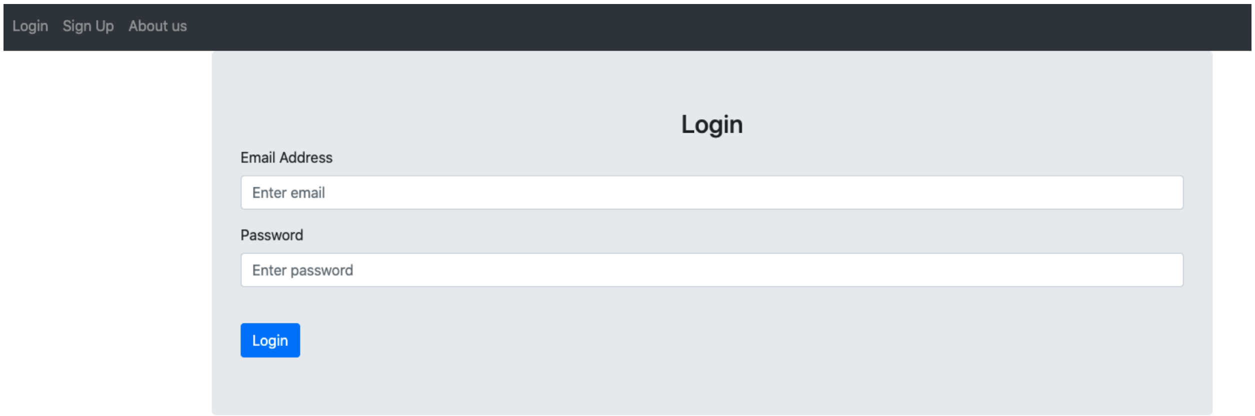
```
You, 1 second ago | 4 authors (Chenghui Song and others)
class Order(db.Model):
    oid = db.Column(db.Integer, primary_key=True)
    onumb=db.Column(db.Integer) # order number
    date = db.Column(db.DateTime(timezone=True), default=func.now())
    bname=db.Column(db.String(150))
    authors = db.Column(db.String(100))
    category=db.Column(db.String(20))
    ISBN=db.Column(db.String(20))
    price  = db.Column(db.Float)
    qty = db.Column(db.Integer)
    order_total=db.Column(db.Float)
    user_id = db.Column(db.Integer, db.ForeignKey('user.id'))

    def toString(self):
        return f"Oid: {self.oid}; Order number {self.onumb}; Date: {self.date}; book name: {self.bname}; book author: {self.authors}; book category:{self.category}; \
        book ISBN: {self.ISBN}; book price; {self.price}; book quantity in stock: {self.qty}; book total: {self.order_total}."


You, 1 second ago | 2 authors (Chenghui Song and others)
class Book(db.Model):
    bid=db.Column(db.Integer,primary_key=True)
    bname=db.Column(db.String(150))
    authors = db.Column(db.String(100))
    category=db.Column(db.String(20))
    ISBN=db.Column(db.String(20))
    price  = db.Column(db.Float)
    qty = db.Column(db.Integer)

    def toString(self):
        return f"Book id: {self.bid}; book name: {self.bname}; book author: {self.authors}; book category:{self.category}; book ISBN: {self.ISBN}; \
            book price; {self.price}; book quantity in stock: {self.qty}."      You, 1 second ago • Uncommitted changes
```

- **Front end**

HTML is our backbone of all our websites. Boostrap is used to enhance the looking of our website. We also have one javascript record. In some pages, Cascading styel sheet (CSS) is used as add-on tool to enhance the looking of our website. We inherit all pages except manager view from base class.

Results

The above figure 1 showed how we designed this system. When we open this page in the browser, firstly, you will go to the login page. When you sign out, you will also go to this page.



Login

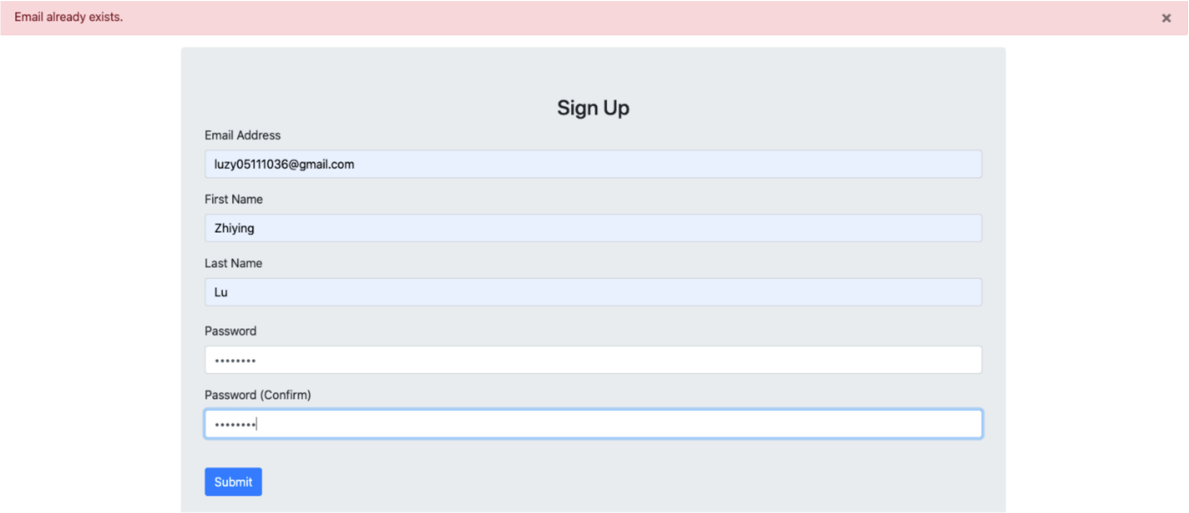
Email Address

Enter email

Password

Enter password

If you do not have an account, you will have to first register your own account by the following Page. The system assigns the user as a customer by default (as compared to "manager" accounts that assigned by the system). You will be checked with the password consistency for 2 inputs. If an email is taken, you have to use a new one.


Email already exists.

Sign Up

Email Address

luzy05111036@gmail.com

First Name

Zhiying

Last Name

Lu

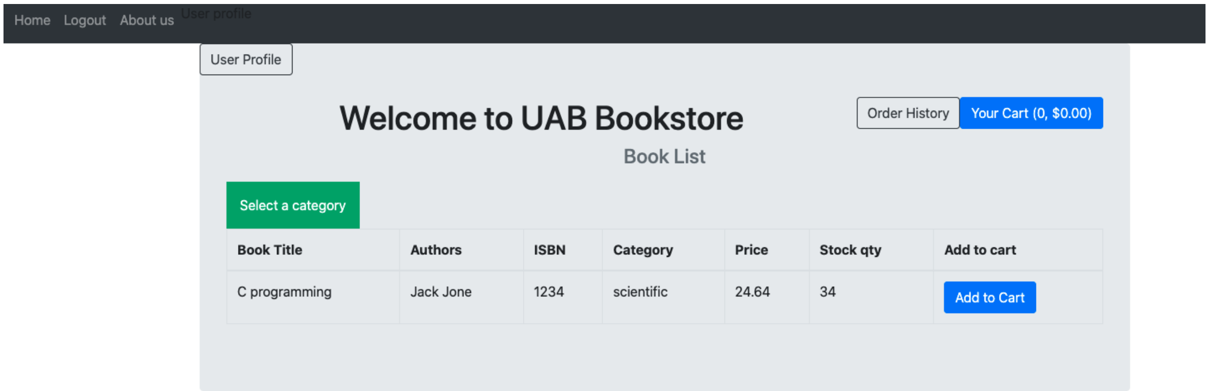
Password

••••••••

Password (Confirm)

••••••••

Once you sign up your new account, you are directly login the website. Of course, you can use your own account to login. Once login in, you will be redirected to the home page, which looks like the second figure below.

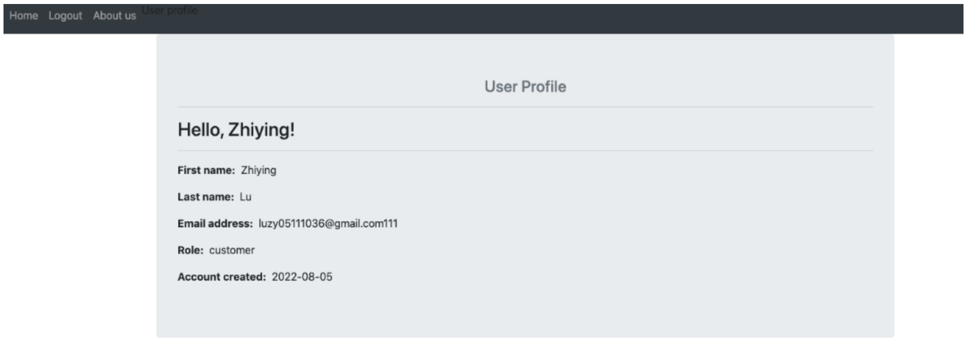


Welcome to UAB Bookstore

Book List

Book Title	Authors	ISBN	Category	Price	Stock qty	Add to cart
C programming	Jack Jone	1234	scientific	24.64	34	Add to Cart

The customer can also view its own profile information by clicking User profile.



User Profile

Hello, Zhiying!

First name: Zhiying

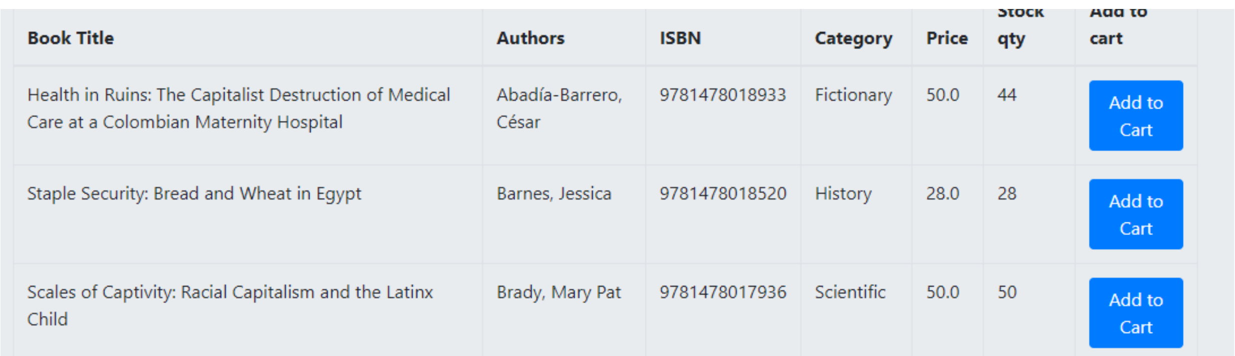
Last name: Lu

Email address: luzy05111036@gmail.com111

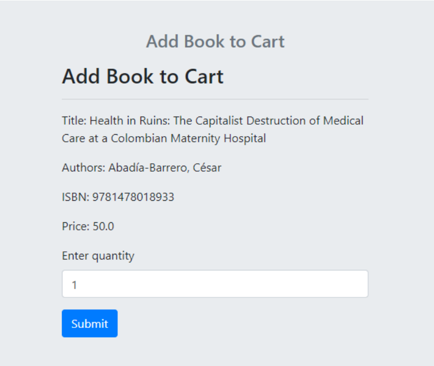
Role: customer

Account created: 2022-08-05

Here, you can look for the book you are interested in by clicking “select a category”. Once find out the book you want to purchase, click the “Add to Cart” button, you will see how much you should pay for this book. You can enter the number if you want to purchase more than one.



Book Title	Authors	ISBN	Category	Price	Stock qty	Add to cart
Health in Ruins: The Capitalist Destruction of Medical Care at a Colombian Maternity Hospital	Abadía-Barrero, César	9781478018933	Fictionary	50.0	44	Add to Cart
Staple Security: Bread and Wheat in Egypt	Barnes, Jessica	9781478018520	History	28.0	28	Add to Cart
Scales of Captivity: Racial Capitalism and the Latinx Child	Brady, Mary Pat	9781478017936	Scientific	50.0	50	Add to Cart



Add Book to Cart

Add Book to Cart

Title: Health in Ruins: The Capitalist Destruction of Medical Care at a Colombian Maternity Hospital

Authors: Abadía-Barrero, César

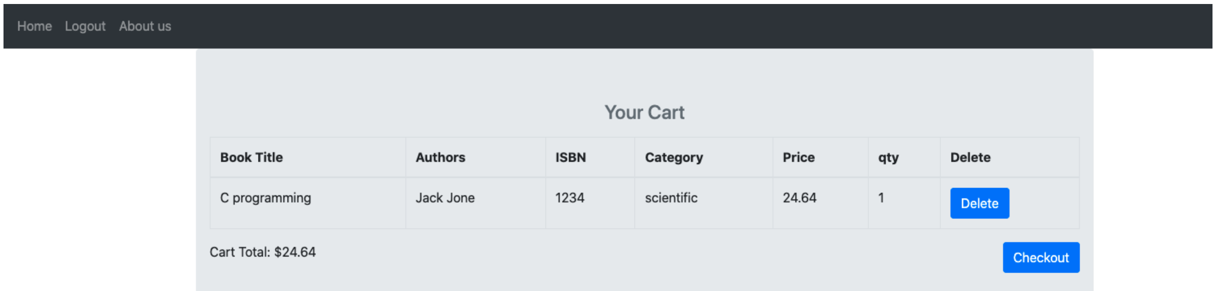
ISBN: 9781478018933

Price: 50.0

Enter quantity

1

Clicking "submit" will take you to the "your Cart" page, and here you can modify your order and then click "Checkout".

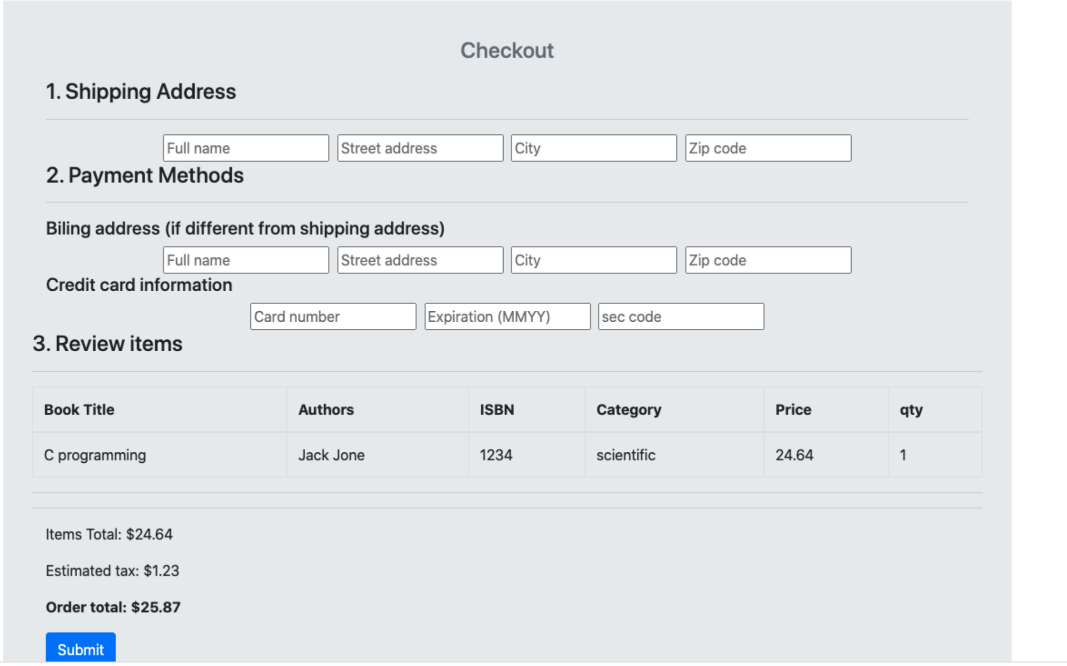


Your Cart

Book Title	Authors	ISBN	Category	Price	qty	Delete
C programming	Jack Jone	1234	scientific	24.64	1	Delete

Cart Total: $24.64

You will be redirected to the payment page where to put information for shipping addresses, payment credit card like you did on amazon.



Checkout

1. Shipping Address

Full name | Street address | City | Zip code

2. Payment Methods

Biling address (if different from shipping address)

Full name | Street address | City | Zip code

Credit card information

Card number | Expiration (MMYY) | sec code

3. Review items

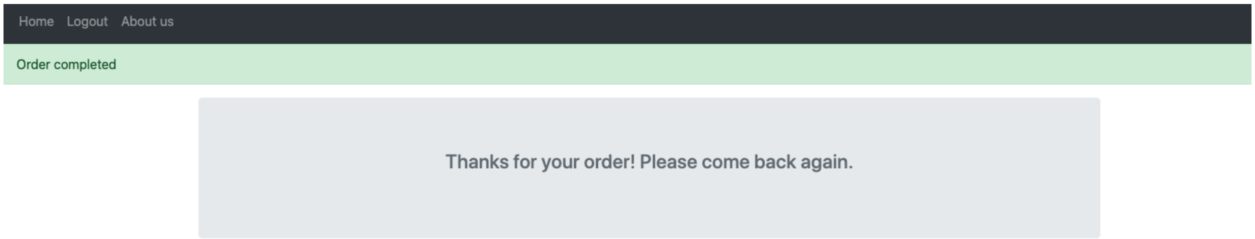
Book Title	Authors	ISBN	Category	Price	qty
C programming	Jack Jone	1234	scientific	24.64	1

Items Total: $24.64

Estimated tax: $1.23

Order total: $25.87

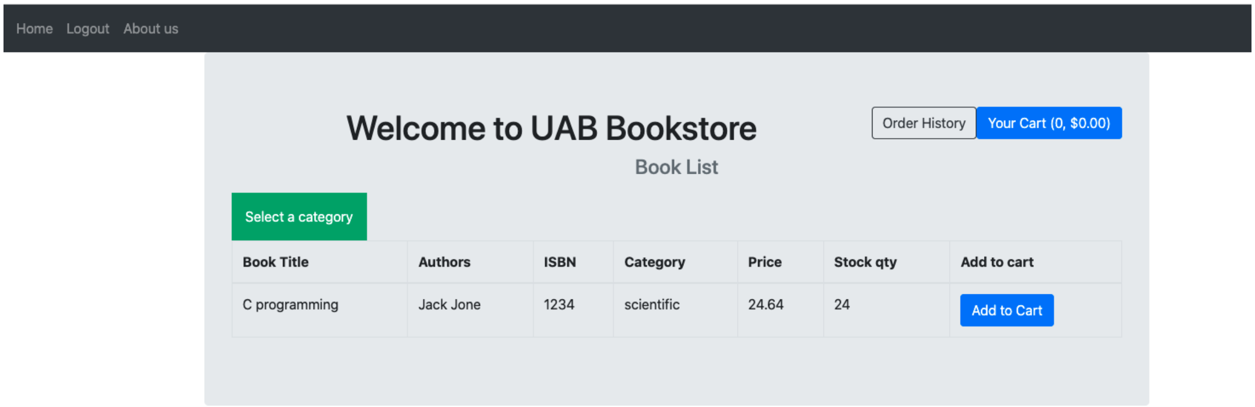
An order is completed once “submit” is clicked, and a thank you page will be shown.



Order completed

Thanks for your order! Please come back again.

Then you can go back to home page, you will see storage number reduce.

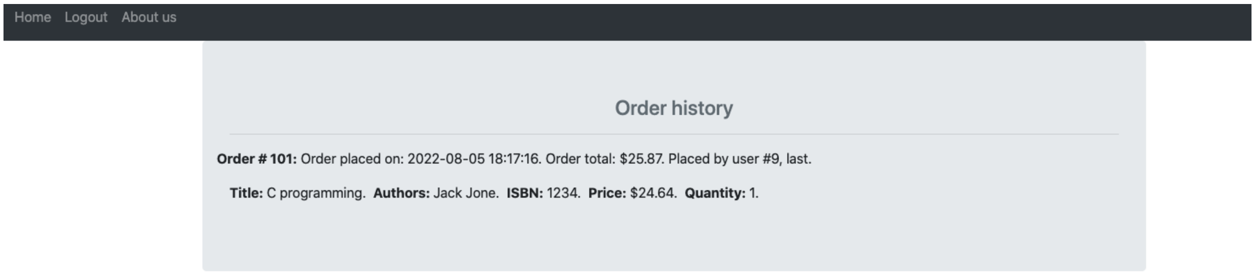


Welcome to UAB Bookstore

Book List

Book Title	Authors	ISBN	Category	Price	Stock qty	Add to cart
C programming	Jack Jone	1234	scientific	24.64	24	Add to Cart

Now, when you view order history by click right-up button “Order History”, you will see you order history

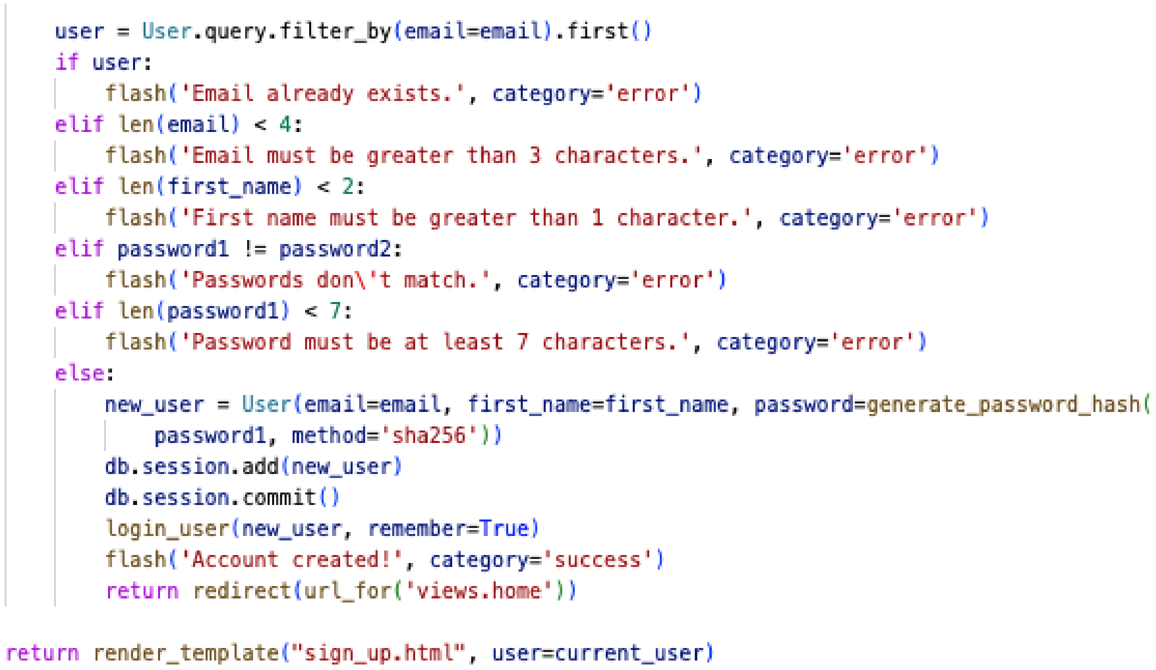


Order history

Order # 101: Order placed on: 2022-08-05 18:17:16. Order total: $25.87. Placed by user #9, last.

Title: C programming. **Authors:** Jack Jone. **ISBN:** 1234. **Price:** $24.64. **Quantity:** 1.

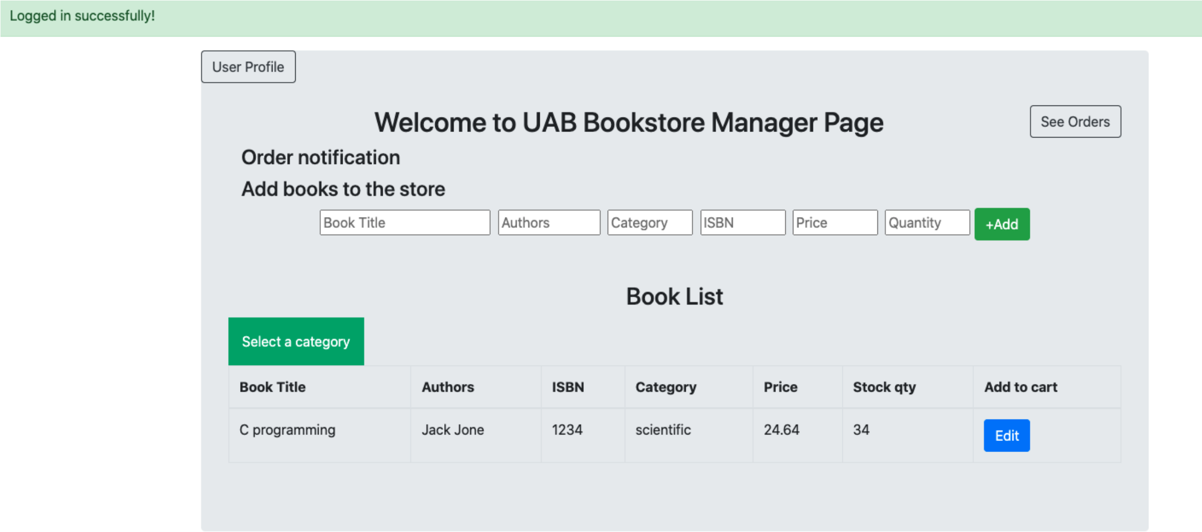
Some basic rules are implemented on sign up sheet, including matched passwords, email length is greater than 4, password length is greater than 7.



```
        user = User.query.filter_by(email=email).first()
        if user:
            flash('Email already exists.', category='error')
        elif len(email) < 4:
            flash('Email must be greater than 3 characters.', category='error')
        elif len(first_name) < 2:
            flash('First name must be greater than 1 character.', category='error')
        elif password1 != password2:
            flash('Passwords don\'t match.', category='error')
        elif len(password1) < 7:
            flash('Password must be at least 7 characters.', category='error')
        else:
            new_user = User(email=email, first_name=first_name, password=generate_password_hash(
                password1, method='sha256'))
            db.session.add(new_user)
            db.session.commit()
            login_user(new_user, remember=True)
            flash('Account created!', category='success')
            return redirect(url_for('views.home'))

    return render_template("sign_up.html", user=current_user)
```

Another major part of this bookstore vendor system is the management system designed for the manager. Only the given account and password can login this information page.

As a manager, you can use the email manager@uab.edu (password:1234567) and manager1@uab.edu (password:1234567) to login, the database will check. If it finds these two email addresses, it will redirect to manager page:



Logged in successfully!

Welcome to UAB Bookstore Manager Page

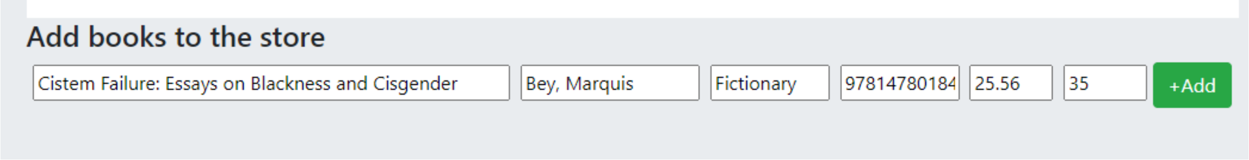
Order notification

Add books to the store

Book List

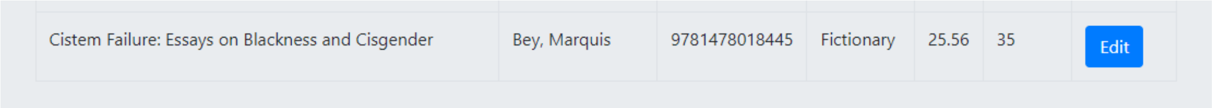
Book Title	Authors	ISBN	Category	Price	Stock qty	Add to cart
C programming	Jack Jone	1234	scientific	24.64	34	Edit

Here, the manager can add new books,



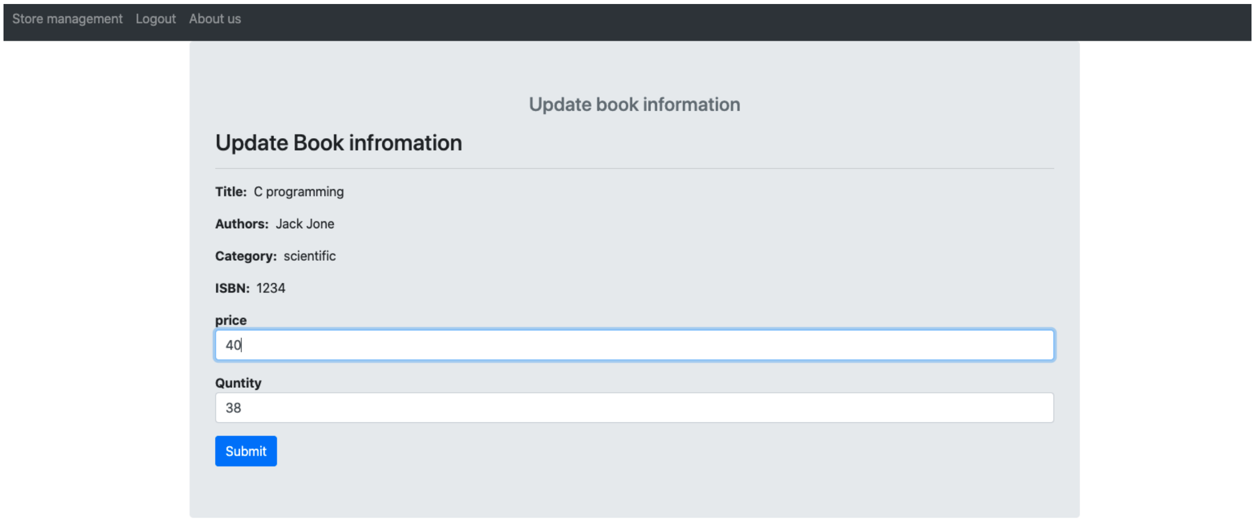
Add books to the store

Cistem Failure: Essays on Blackness and Cisgender	Bey, Marquis	Fictionary	97814780184	25.56	35	+Add



Cistem Failure: Essays on Blackness and Cisgender	Bey, Marquis	9781478018445	Fictionary	25.56	35	Edit

Modify the price and stock quantity if necessary.



Update book information

Update Book infromation

Title: C programming

Authors: Jack Jone

Category: scientific

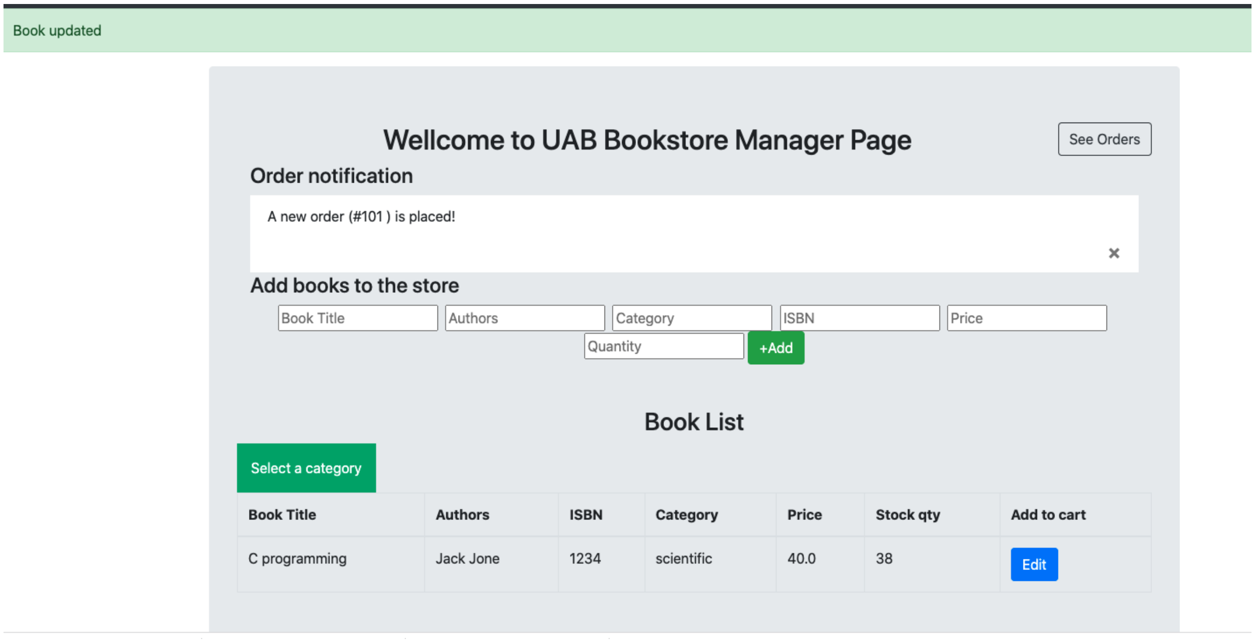
ISBN: 1234

price

40

Quntity

38


Book updated

Wellcome to UAB Bookstore Manager Page

Order notification

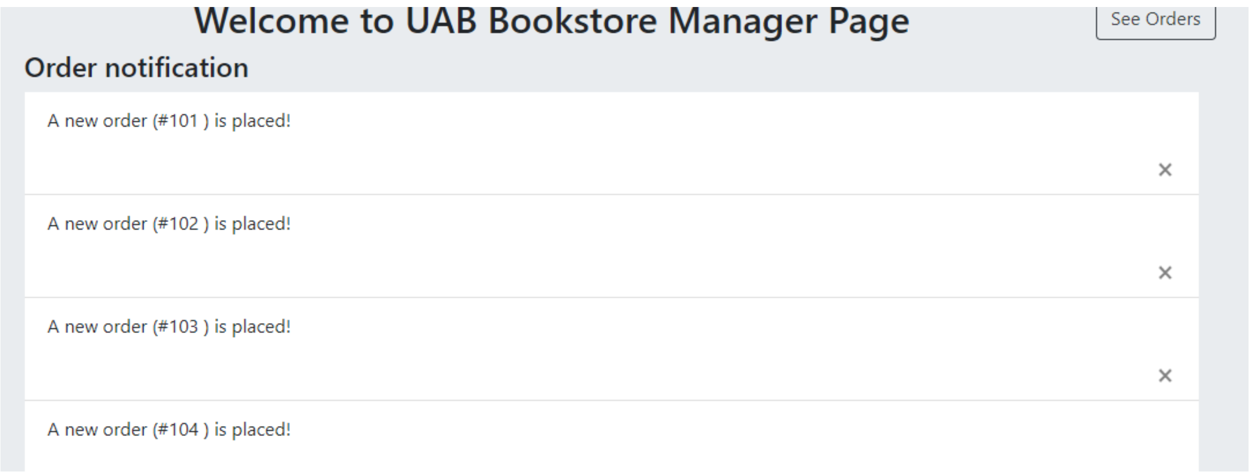
A new order (#101) is placed!

Add books to the store

Book List

Book Title	Authors	ISBN	Category	Price	Stock qty	Add to cart
C programming	Jack Jone	1234	scientific	40.0	38	Edit

Each order will create an item in the Note table with the order number and manager id, so that each manager receives a notification in the “notification” area:


Welcome to UAB Bookstore Manager Page

Order notification

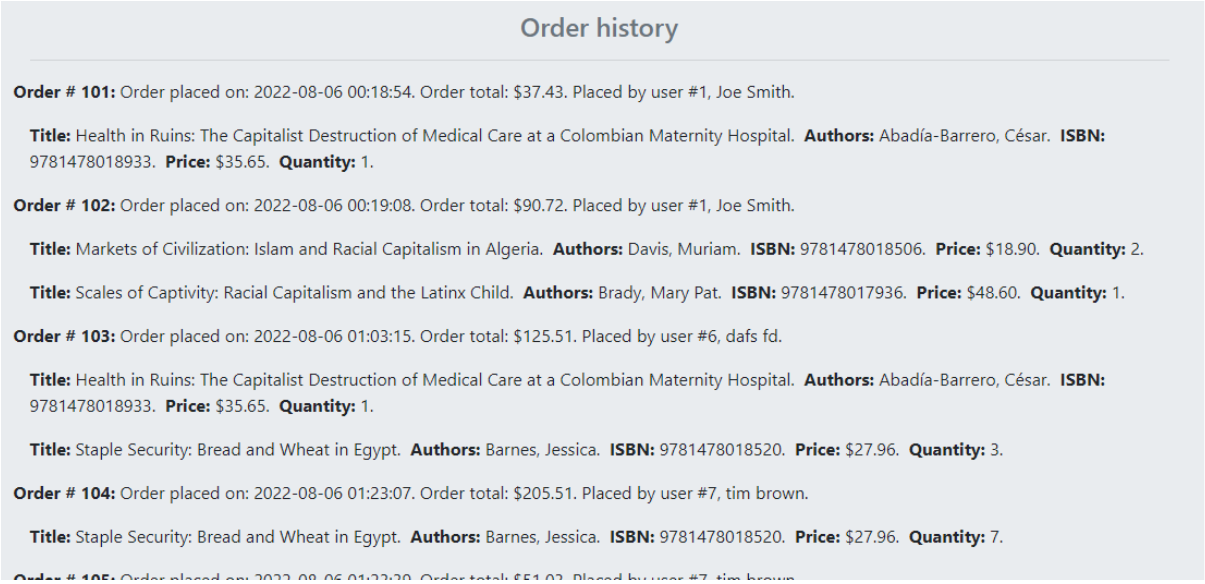
A new order (#101) is placed!

A new order (#102) is placed!

A new order (#103) is placed!

A new order (#104) is placed!

The manager can delete each note by clicking “x”, but all the order information is always available by clicking the “See Order” button in the right corner, which shows the order list and the detail of each order, including the date and time of each order is being placed.



Order history

Order # 101: Order placed on: 2022-08-06 00:18:54. Order total: $37.43. Placed by user #1, Joe Smith.

Title: Health in Ruins: The Capitalist Destruction of Medical Care at a Colombian Maternity Hospital. **Authors:** Abadía-Barrero, César. **ISBN:** 9781478018933. **Price:** $35.65. **Quantity:** 1.

Order # 102: Order placed on: 2022-08-06 00:19:08. Order total: $90.72. Placed by user #1, Joe Smith.

Title: Markets of Civilization: Islam and Racial Capitalism in Algeria. **Authors:** Davis, Muriam. **ISBN:** 9781478018506. **Price:** $18.90. **Quantity:** 2.

Title: Scales of Captivity: Racial Capitalism and the Latinx Child. **Authors:** Brady, Mary Pat. **ISBN:** 9781478017936. **Price:** $48.60. **Quantity:** 1.

Order # 103: Order placed on: 2022-08-06 01:03:15. Order total: $125.51. Placed by user #6, dafs fd.

Title: Health in Ruins: The Capitalist Destruction of Medical Care at a Colombian Maternity Hospital. **Authors:** Abadía-Barrero, César. **ISBN:** 9781478018933. **Price:** $35.65. **Quantity:** 1.

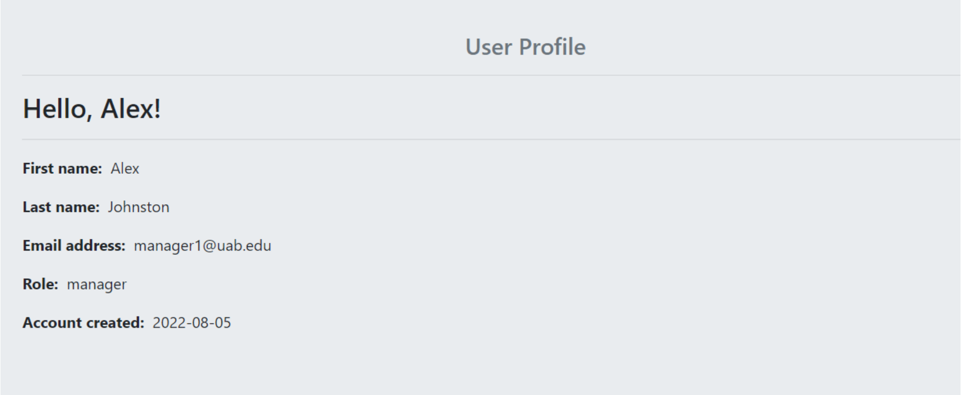
Title: Staple Security: Bread and Wheat in Egypt. **Authors:** Barnes, Jessica. **ISBN:** 9781478018520. **Price:** $27.96. **Quantity:** 3.

Order # 104: Order placed on: 2022-08-06 01:23:07. Order total: $205.51. Placed by user #7, tim brown.

Title: Staple Security: Bread and Wheat in Egypt. **Authors:** Barnes, Jessica. **ISBN:** 9781478018520. **Price:** $27.96. **Quantity:** 7.

Order # 105: Order placed on: 2022-08-06 01:23:39. Order total: $51.03. Placed by user #7, tim brown.

Meanwhile, manager can click the up-left button “User profile” to view customer information.



User Profile

Hello, Alex!

First name: Alex

Last name: Johnston

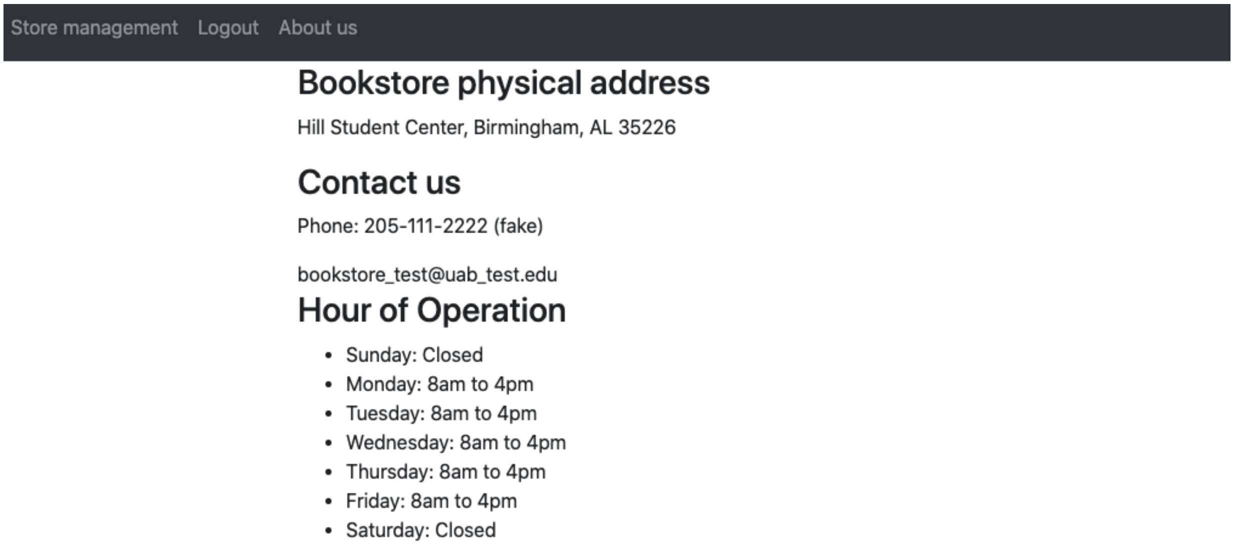
Email address: manager1@uab.edu

Role: manager

Account created: 2022-08-05

Customer’s record (Password is confidential information and hidden from output).

About us page is used to introduce this bookstore and its time for operation. A Youtube video is provided.



Bookstore physical address

Hill Student Center, Birmingham, AL 35226

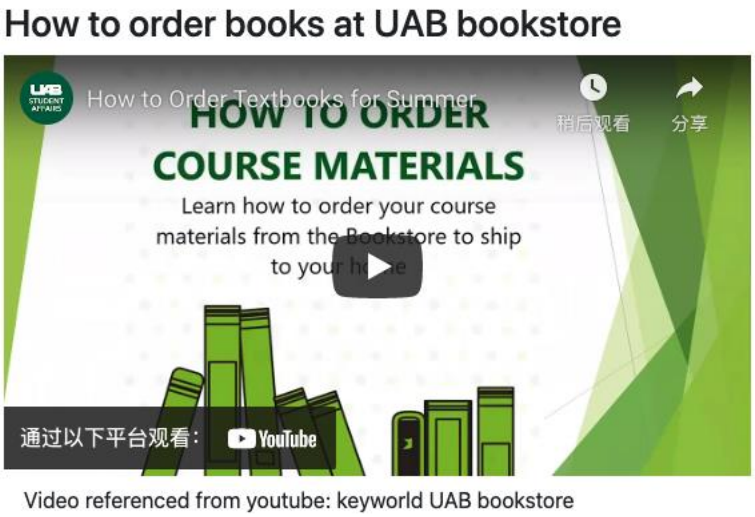
Contact us

Phone: 205-111-2222 (fake)

bookstore_test@uab_test.edu

Hour of Operation

- Sunday: Closed
- Monday: 8am to 4pm
- Tuesday: 8am to 4pm
- Wednesday: 8am to 4pm
- Thursday: 8am to 4pm
- Friday: 8am to 4pm
- Saturday: Closed

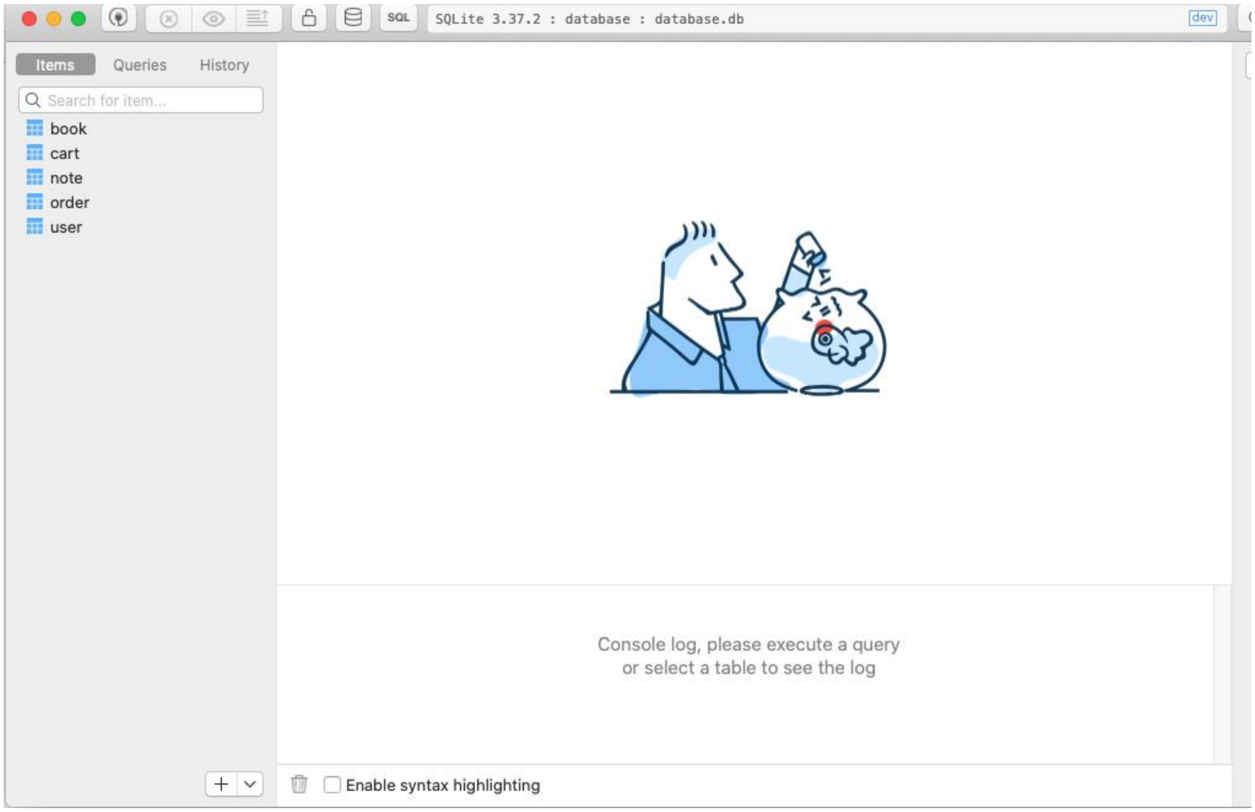


How to order books at UAB bookstore

UAB STUDENT AFFAIRS
How to Order Textbooks for Summer
稍后观看
分享
HOW TO ORDER
COURSE MATERIALS
Learn how to order your course materials from the Bookstore to ship to your home
通过以下平台观看：
YouTube

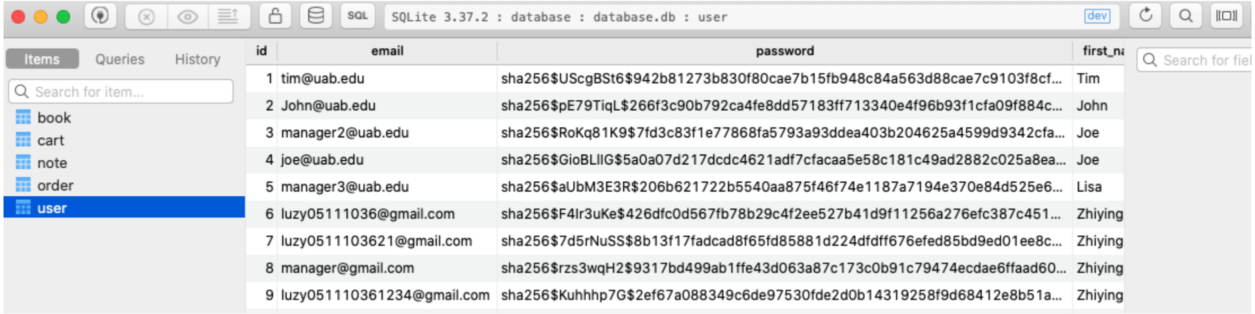
Video referenced from youtube: keyworld UAB bookstore

Database: This is how database looks like viewed by Tableplus. You can see we have 5 tables.



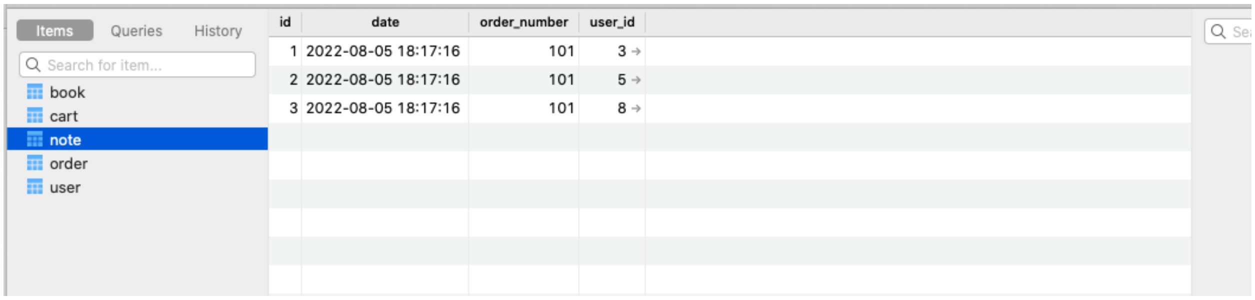
SQLite 3.37.2 : database : database.db

Console log, please execute a query
or select a table to see the log

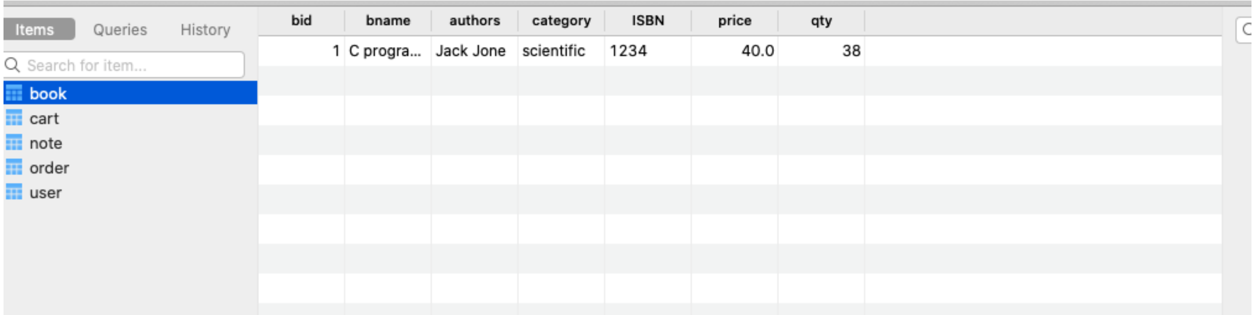


SQLite 3.37.2 : database : database.db : user

id	email	password	first_na
1	tim@uab.edu	sha256$UScgBSt6$942b81273b830f80cae7b15fb948c84a563d88cae7c9103f8cf...	Tim
2	John@uab.edu	sha256$pE79TiqL$266f3c90b792ca4fe8dd57183ff713340e4f96b93f1cfa09f884c...	John
3	manager2@uab.edu	sha256$RoKq81K9$7fd3c83f1e77868fa5793a93ddea403b204625a4599d9342cfa...	Joe
4	joe@uab.edu	sha256$GioBLlIG$5a0a07d217dcdc4621adf7cfacaa5e58c181c49ad2882c025a8ea...	Joe
5	manager3@uab.edu	sha256$aUbM3E3R$206b621722b5540aa875f46f74e1187a7194e370e84d525e6...	Lisa
6	luzy05111036@gmail.com	sha256$F4Ir3uKe$426dfc0d567fb78b29c4f2ee527b41d9f11256a276efc387c451...	Zhiying
7	luzy0511103621@gmail.com	sha256$7d5rNuSS$8b13f17fadcad8f65fd85881d224dfdff676efed85bd9ed01ee8c...	Zhiying
8	manager@gmail.com	sha256$rzs3wqH2$9317bd499ab1ffe43d063a87c173c0b91c79474ecdae6ffaad60...	Zhiying
9	luzy051110361234@gmail.com	sha256$Kuhhhp7G$2ef67a088349c6de97530fde2d0b14319258f9d68412e8b51a...	Zhiying



id	date	order_number	user_id
1	2022-08-05 18:17:16	101	3 →
2	2022-08-05 18:17:16	101	5 →
3	2022-08-05 18:17:16	101	8 →



bid	bname	authors	category	ISBN	price	qty
1	C progra...	Jack Jone	scientific	1234	40.0	38

Discussions / Future Works

There are many frameworks that can be used for web design. We choose flask is because not only it is taught in the classroom, but also Flask is a micro web framework written in Python. It does not require particular tools or libraries. It has no database abstraction layer, form validation, or any other components where pre-existing third-party libraries provide common functions (4). Through this project we learn how to team up and collaborate with other developers for a big project. In this project, our skills for python, git and Jinja are practiced. Most importantly, we learn the framework flask, how to create and use a database, and deeply understand the relational database by using it.

Though this project meets the requirements we set at the beginning, the layout, scalability and security are not carefully considered. These are important for a real project. When we do a real project, we should consider this at the design stage. To make this book vendor system can be used in reality, we should consider (1) improving the layout, making it look fancier ;(2) design API so that manager or three-party(with authorization) can upload and download the book information by import .CSV/ .json file. One drawback of our bookstore is that we don’t have search key for customers to search their keywords. The feature can be implemented in future work.

Identically, manager can use MySQL, Postgres SQL or python scripts to read order record, customer record and manage book record from backup. In that way, we can totally prevent potential leakage of sensitive information in customer’s names and order record (including credit card information). In addition, more database can be created to track user behavior, including mouse clicks on the product, how long each customer looks over products and what type of keywords customers are frequently searched. In this sense, simple database is insufficient to manage this website. We will need larger database and use NoSQL and SQL databases to manage bookstore. Ideally, cloud based SQL database and NoSQL database would be used to manage the database part of the backend of this website because they are stable and easily to be maintained.

Reference

(1) https://www.techopedia.com/2/31579/networks/a-brief-history-of-web-development#:~:text=Conceived%20in%20the%201980s%2C%20the,massive%20influx%20of%20online%20activity.

(2) https://www.comentum.com/guide-to-web-application-development.html

(3) https://www.techopedia.com/definition/23889/web-development#:~:text=Web%20development%20refers%20in%20general,security%20configuration%2C%20among%20other%20tasks.

(4) https://en.wikipedia.org/wiki/Flask_(web_framework)

(5) https://www.youtube.com/watch?v=Z1RJmh_OqeA&t=4s

(6). YouTube video that teaches Flask, authentication and database. I used this tutorial through my homework 2, 3,4 to implement webpage.

(7) Dr Unan’s lecture notes and lab notes.