BOOK | Spartan

Team 25

Final Report

San Jose State University

CS 157A / Section 1

Fall 2019 - Team 25

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Date:

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Project Requirements

I. Project Description

In this project, we will be working on a three-tier database application for SJSU students to sell or buy their used textbooks. We will be developing a database for an e-commerce site for online textbook shopping service. A popular way for students to save money on course materials is to purchase used textbooks. The goal is to provide a common interactive platform for students to buy new/used textbooks or listing their used textbooks for sale. In addition, we would also like to offer another alternative for SJSU students that want to reliably sell and buy used textbooks. In this application, there will be 2 majorities of users will be using this application which is the buyer and the seller of the used textbooks. The seller can sell their used textbook at any price as they wish. An e-commerce website will provide ease of access to our products/services and satisfy the demands of our customers in a timely manner.

II. System Environment

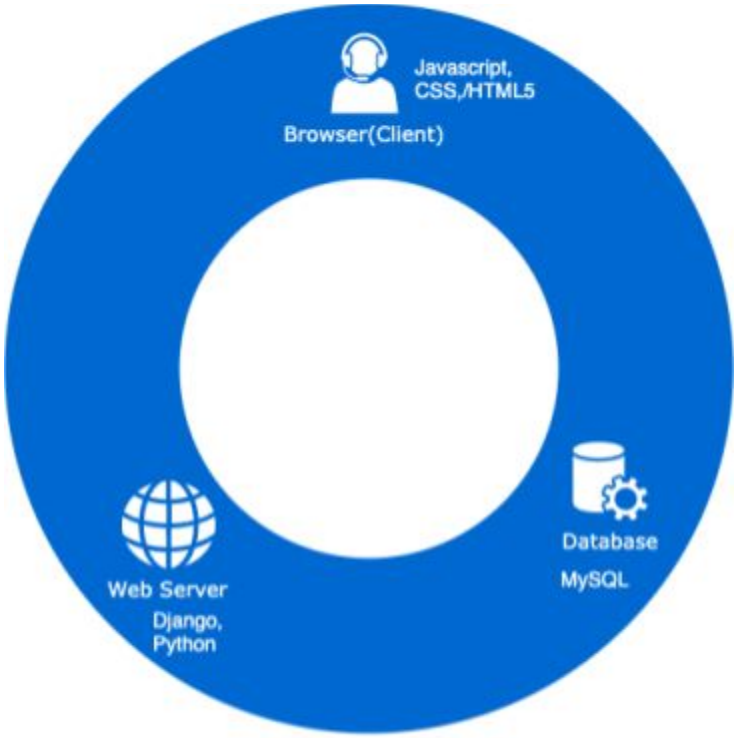


Figure 1 System Architecture

The hardware/software that was used to develop the system were Mac OSX and Windows 10 machines. The RDBMS for persistent data storage was MySQL 8.0. The structure of our system is represented by (Figure 1) above. The client interface/front-end of the system was built using JavaScript, CSS, and HTML 5. The server that we setup was built using the Django web framework for the Python language. Finally, the database tier utilized MySQL for persistent data storage. Additional application languages that was used for development were Github, [...].

III. **Functional Requirements**

Account Login

- Users will be prompt with a login panel and they must log into their personal account to continue with the application.

Registering a new account

- Users will also be given an option on the startup screen to register a new account. Users will submit the necessary information for account creation and use the newly created account to login to the application.
- **This will inserts a new row into Account table**

Changing Account Information

- Users can change their own account information such as email, first name, last name, profile picture
- **This will update a row in Account table**

Viewing the Textbook Catalog

- Users will be able the view the entire textbook catalogue on sale. They will also have the options to order the textbooks by title, author, or price

Searching for a textbook

- Users will be able to search for a specific textbook by inputting certain information such as Title, Author, ISBN # and it will return a list view of all textbooks matching the description

Add a Textbook to Wishlist

- Users can bookmark various textbooks they are interested in for convenient access later. The list of the bookmarked textbook will appear in the Bookmark tab in their profile for them to view.
- **This will inserts a new row into Wishlist table**

Remove Textbook from Wishlist

- Users can remove textbooks from their wishlist.
- **This will delete a row from Wishlist table.**

Add a Textbook to Shopping Cart

- Users can add items to their shopping cart to buy
- **This will inserts a new row into Shopping Cart table**

Remove Textbook from Shopping Cart

- Users can remove textbooks from their shopping cart
- **This will delete a row from Shopping Cart table**

User profile

- Every user will have their own profile page containing their basic information and user will be able to update their own profile page. They may also be able to view other people's profile such as a seller for a textbook they are interested in buying.

Listing a Textbook for Sale

- Users can list a textbook that they have for sale. They must provide information regarding the textbook-like Title, Author, ISBN #, Price, Publisher, Year Published, a short description of the condition of the textbook, and a couple of images displaying the textbook.
- Users can also update their existing textbook listings. They can cancel these listings or update information about them such as price, conditions of the textbook, or upload new images of the textbook.
- **This will add a new row into Textbook and Listing table. Also add one or more rows into Category Has Textbook table.**

Checkout Order

- Users should be able to checkout their order and purchase the textbooks they want
- **This will add a new row into Order, Checkout, and one or more row into Order Contain Textbook table. It will also update a row in Listing table and deletes all textbooks purchased from every account's Wishlist and Shopping Cart. It may add one row to PaymentInfo and Account_Has_PaymentInfo table if user adds a new credit card.**

View Order History

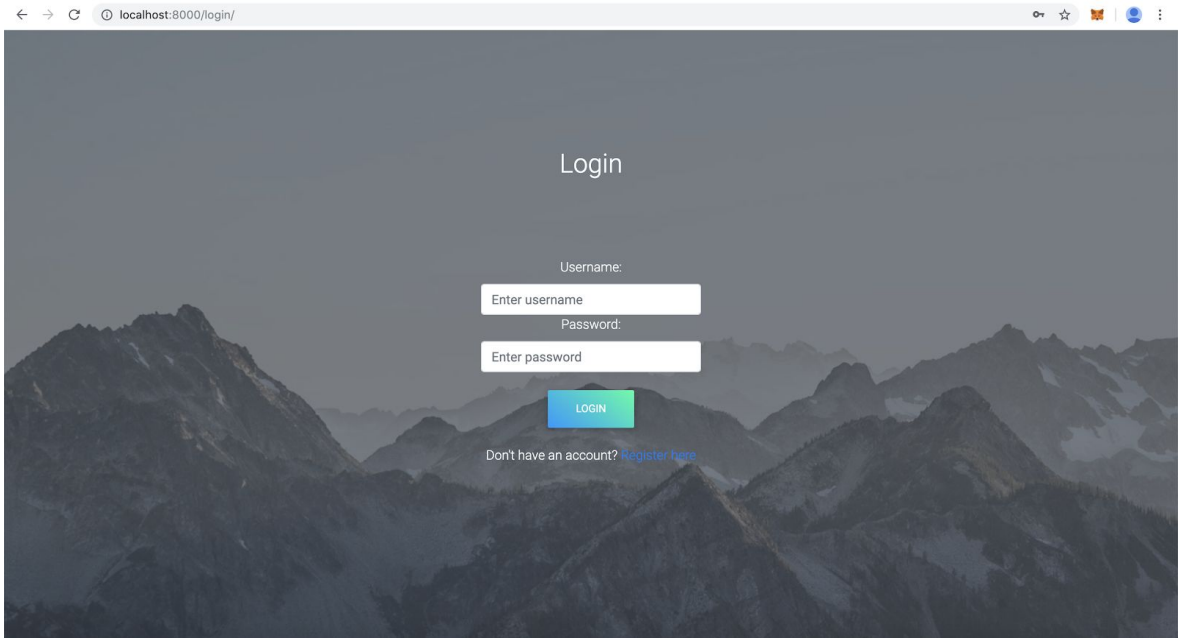
- Users can view their order history and see what they have purchased

View Credit Cards Saved

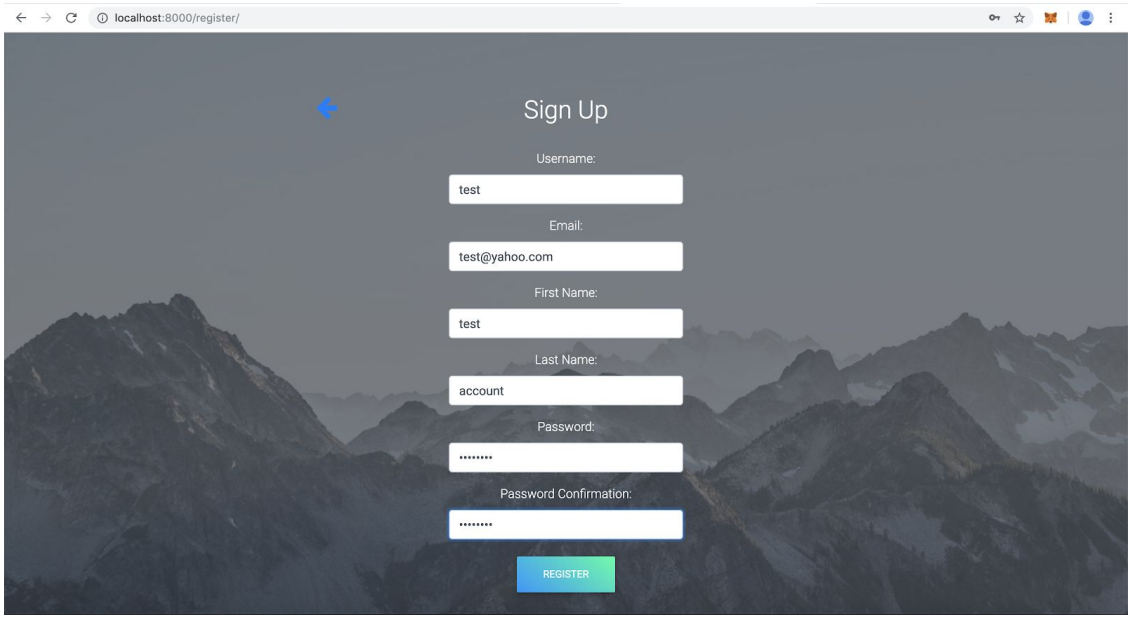
- Users can see what credit cards they have used for past orders

IV. Non-functional Issues

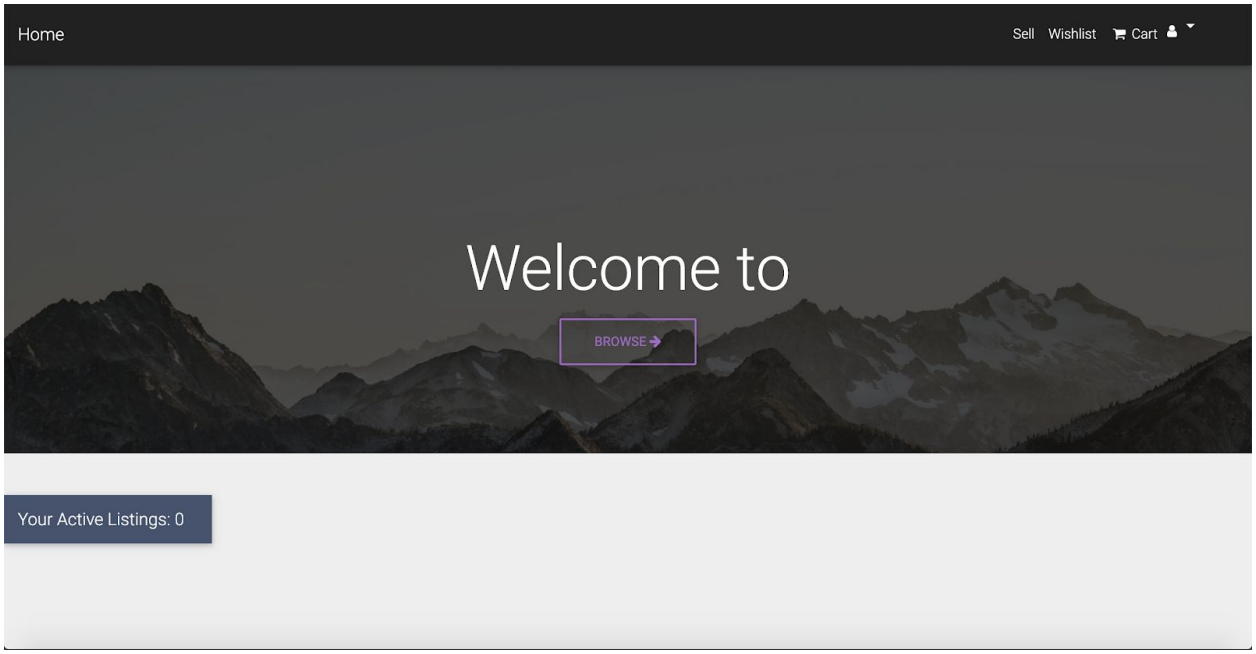
GUI



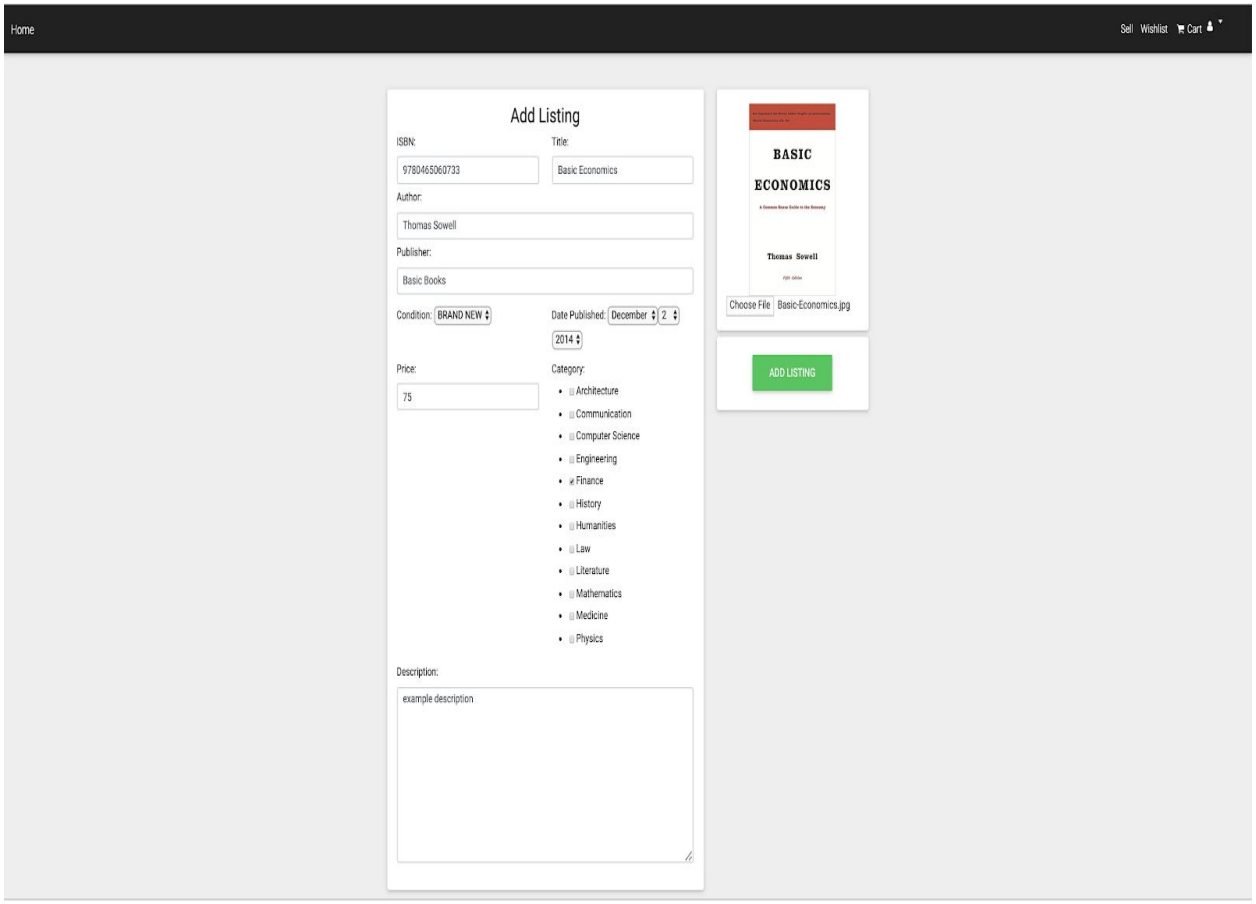
This is the default login page when you starts up the server



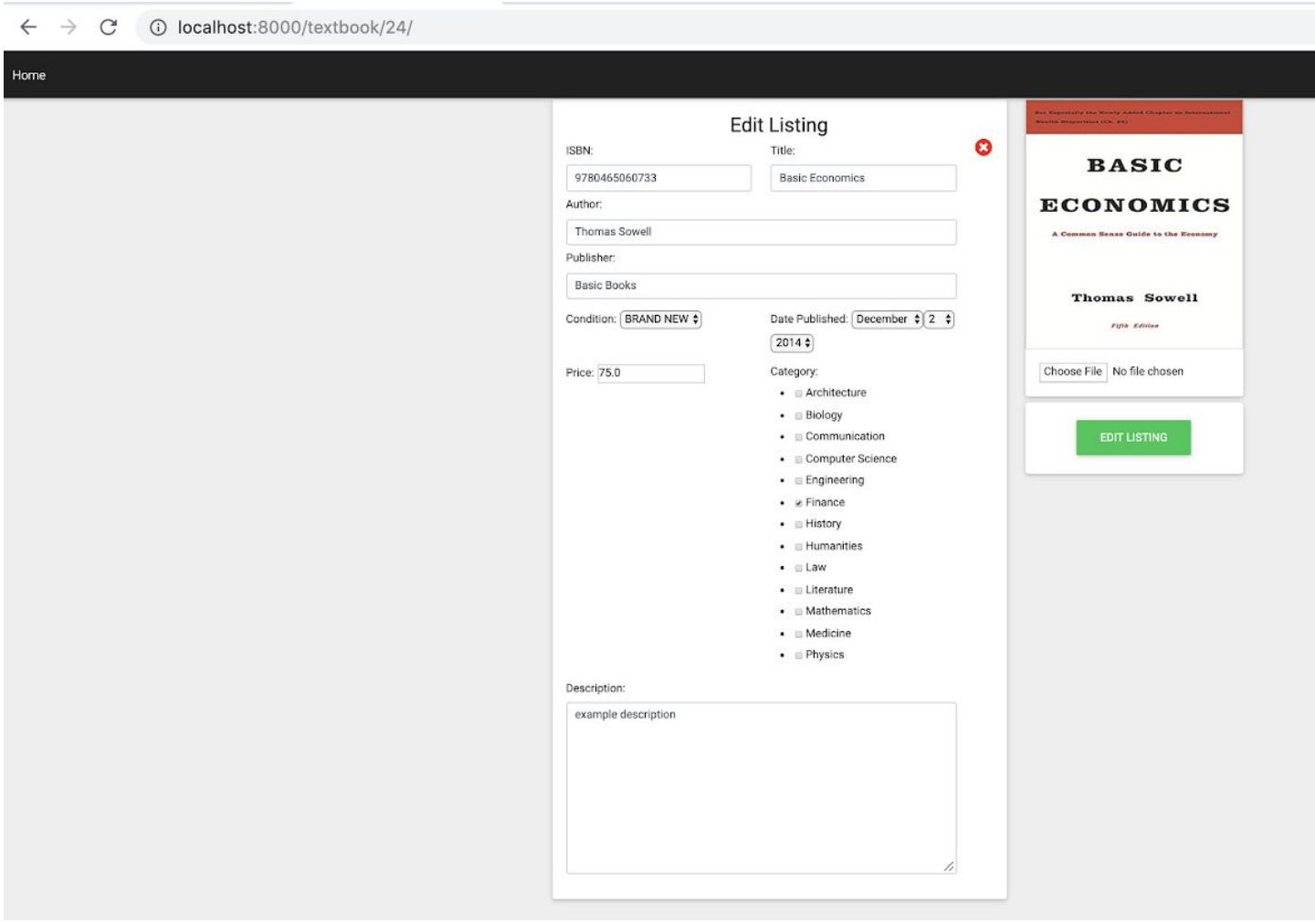
Registration screen for you to register a new account



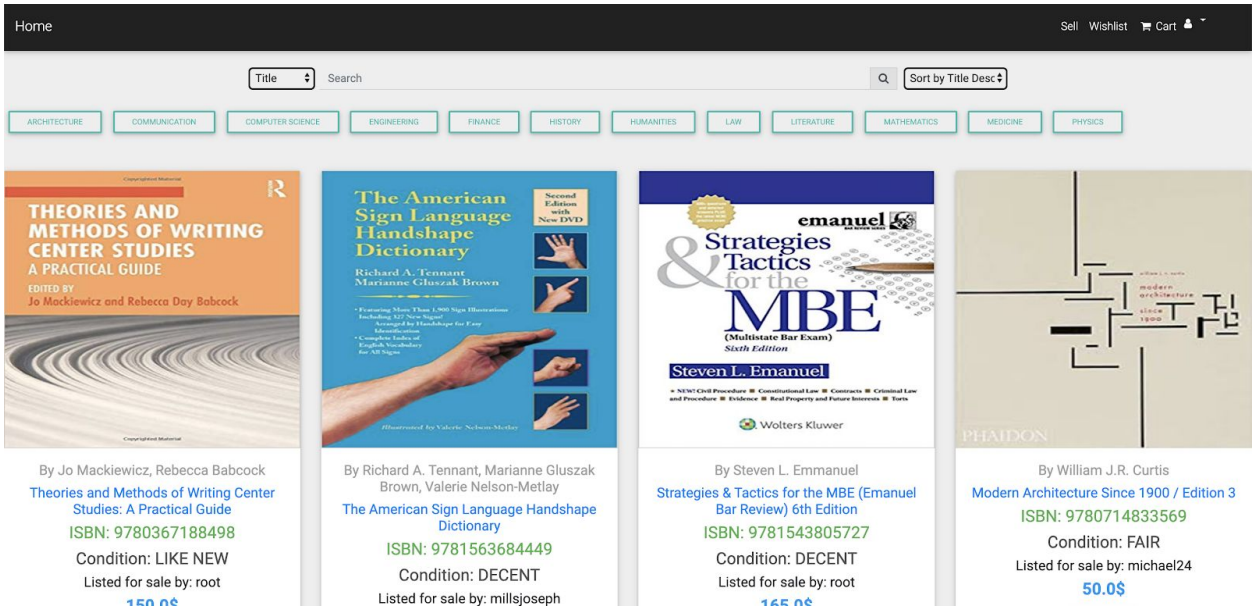
The homepage screen, you can click Browse to go see the list of available textbooks for sale. If you have any active listings, they will be display on the bottom if you scroll down



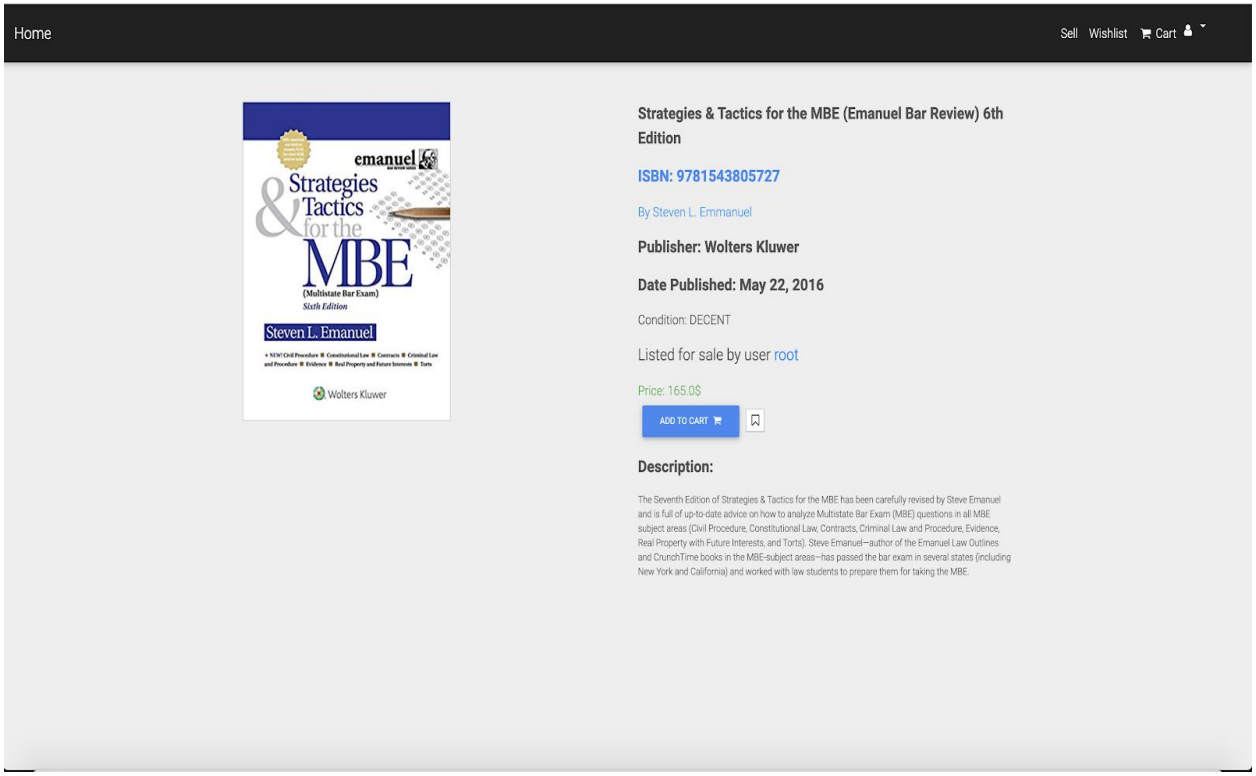
On the upper right corner, you can click the Sell button to be redirected to an Add Listing form so you can input information about your textbook and list them for sale.



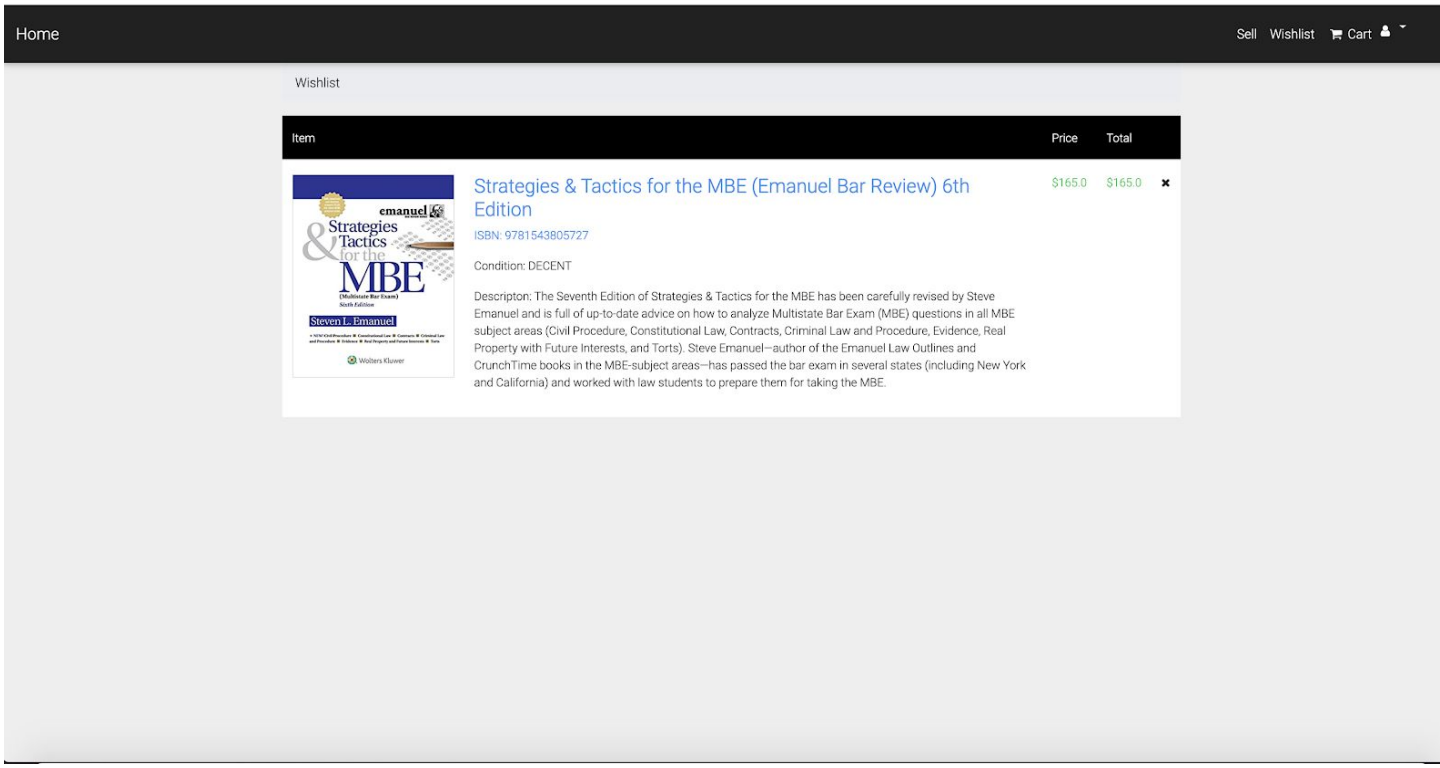
If you have an active listing for sale, you can scroll down on the homepage clicks on the Edit Listing button and be redirected to a form so that you can change the information about your listing.



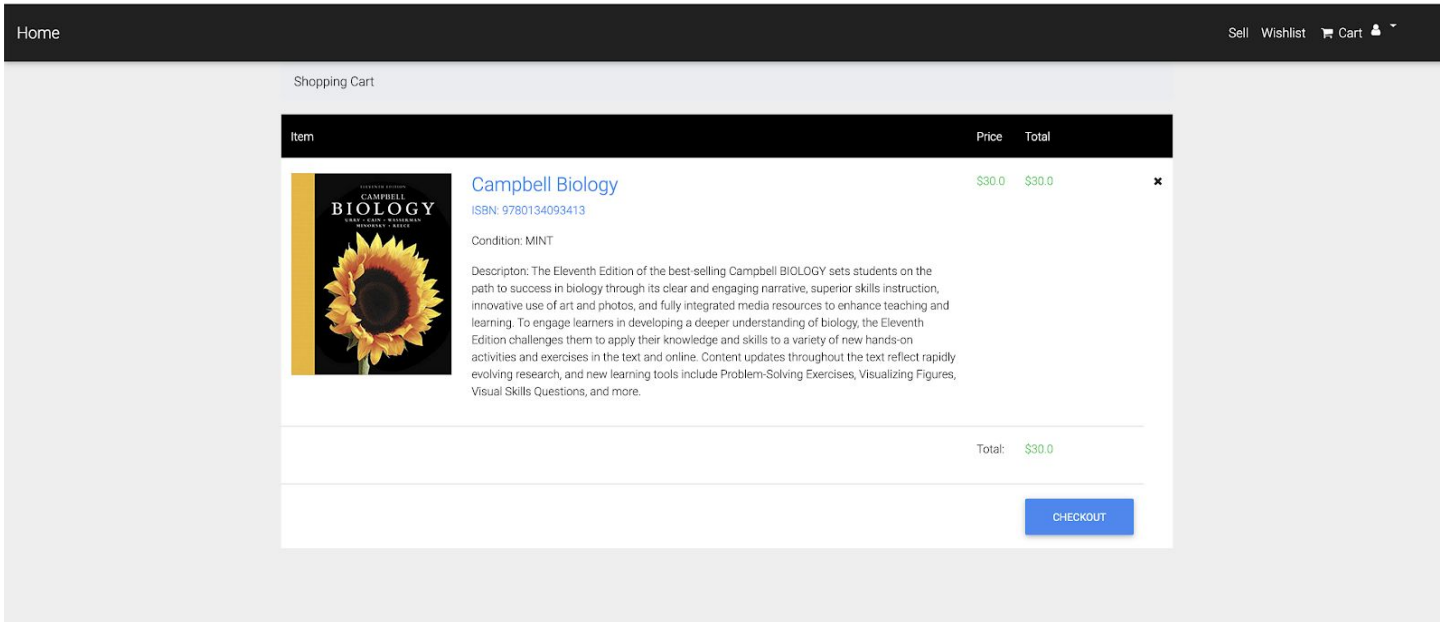
If you clicks on the Browse button on the homepage, it will sends you to a page where you can see and filter the textbook listings for sale. More information on the search listing functionality in the database implementation section.



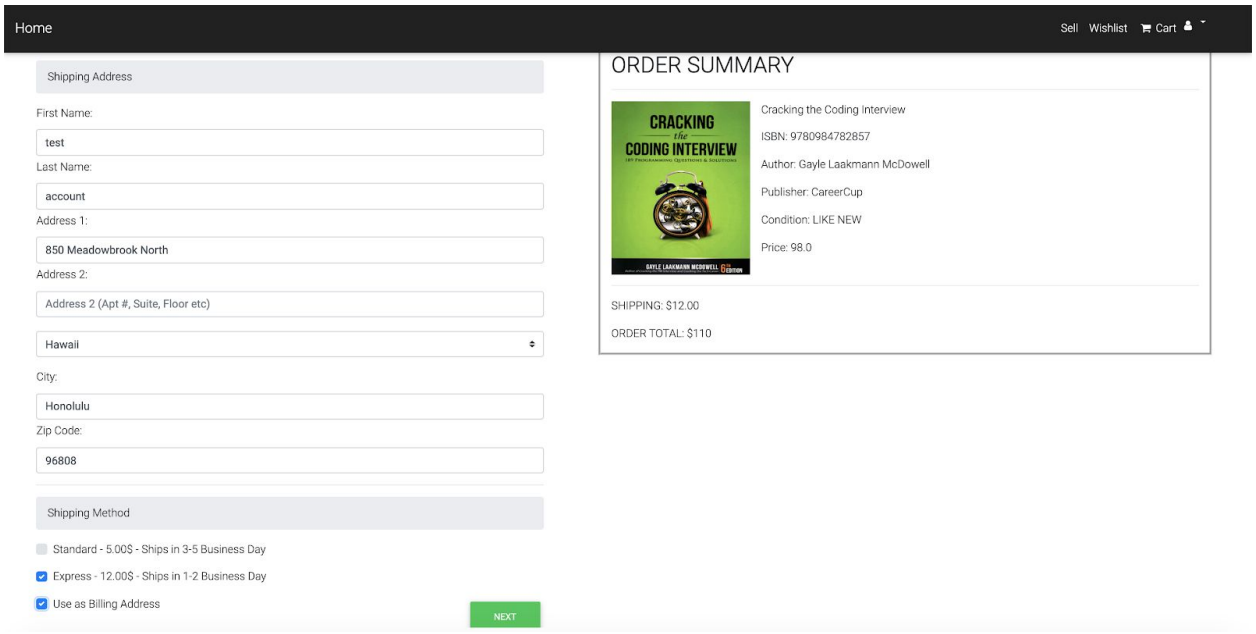
This is the view product page for a textbook listing. You can click the Add to Cart button to add the textbook to your shopping cart. You can also clicks the icon next to the Add to Cart button to add textbook to your wishlist



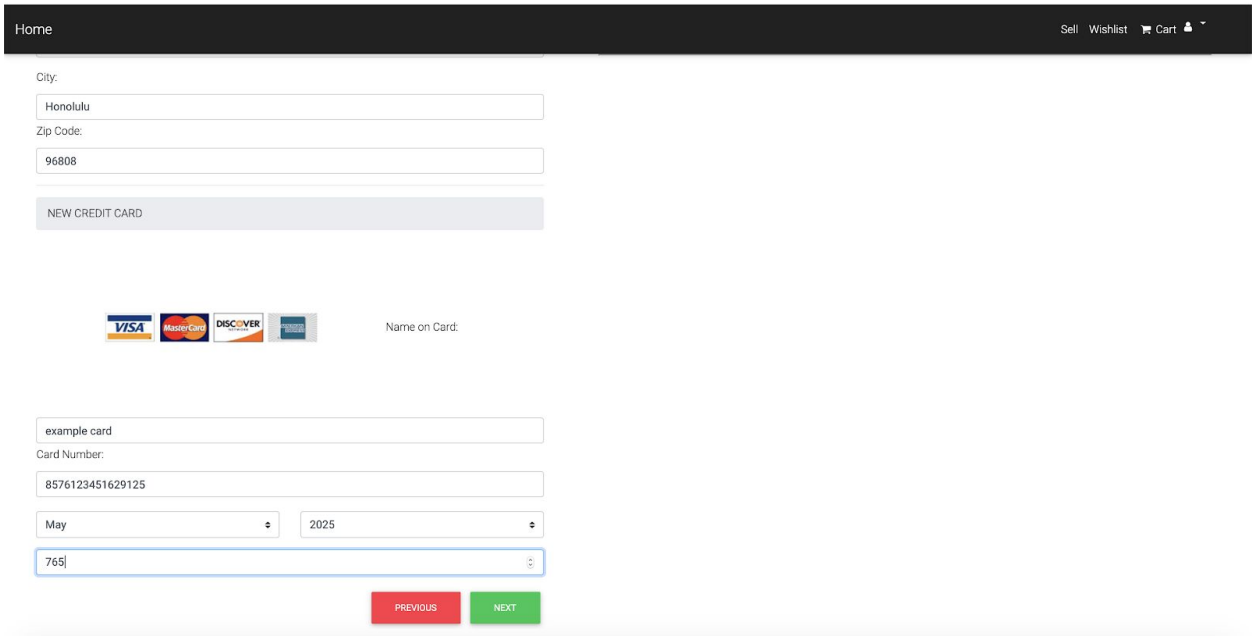
If you click on Wishlist in the upper right corner, you will be redirected to a page where you can see the items in your wishlist. You can clicks the little x next to each textbook listing next to the Total column to remove the item from your wishlist.



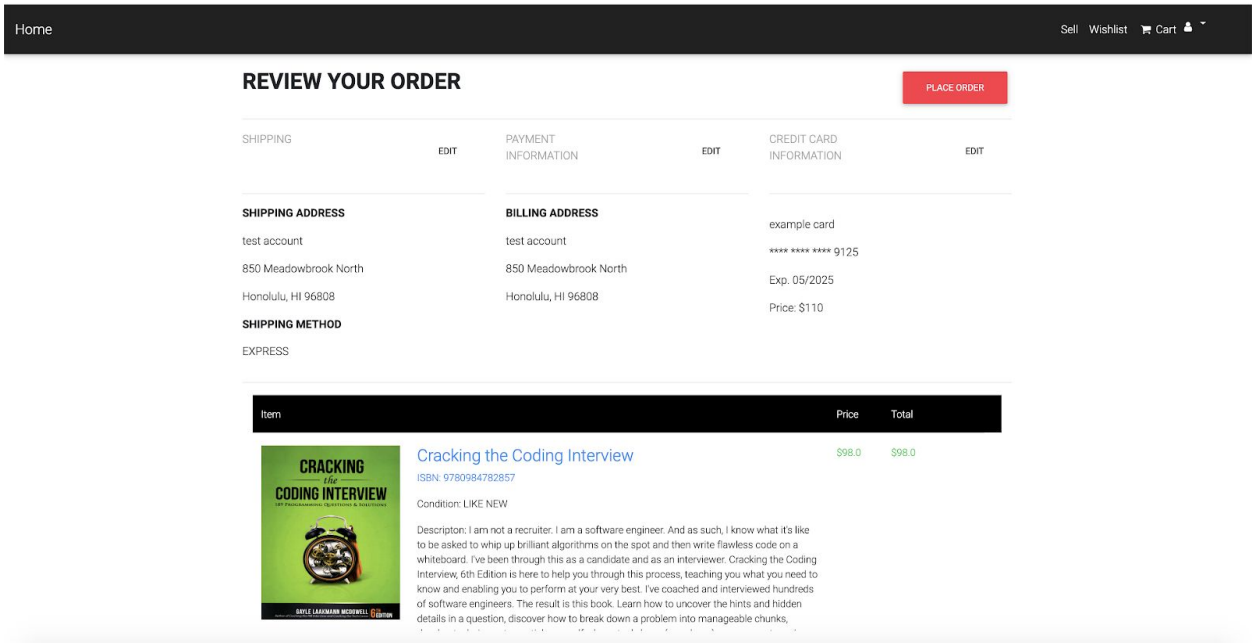
On the upper right corner, clicking the Cart icon will sends you to your shopping cart. Similar to wishlist page, you can clicks the little x to the right next to the Total column to delete the item from your shopping cart. You can also clicks Checkout to begins placing the order.



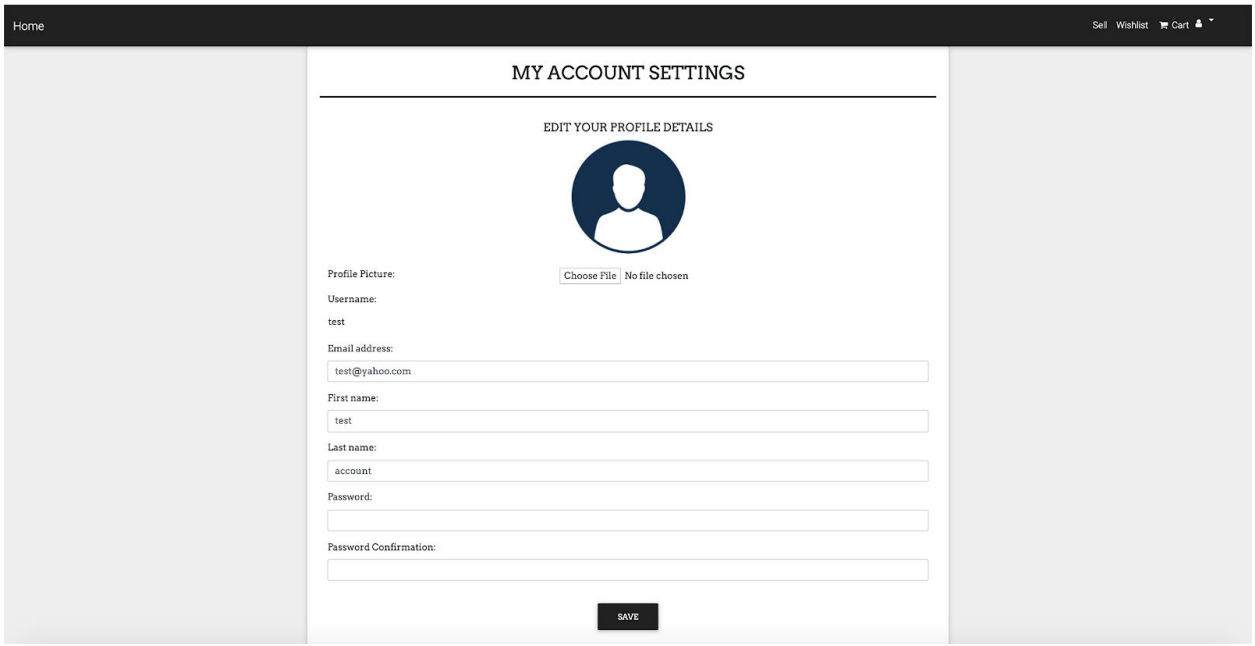
First step of the checkout form, input your shipping address and choose shipping methods



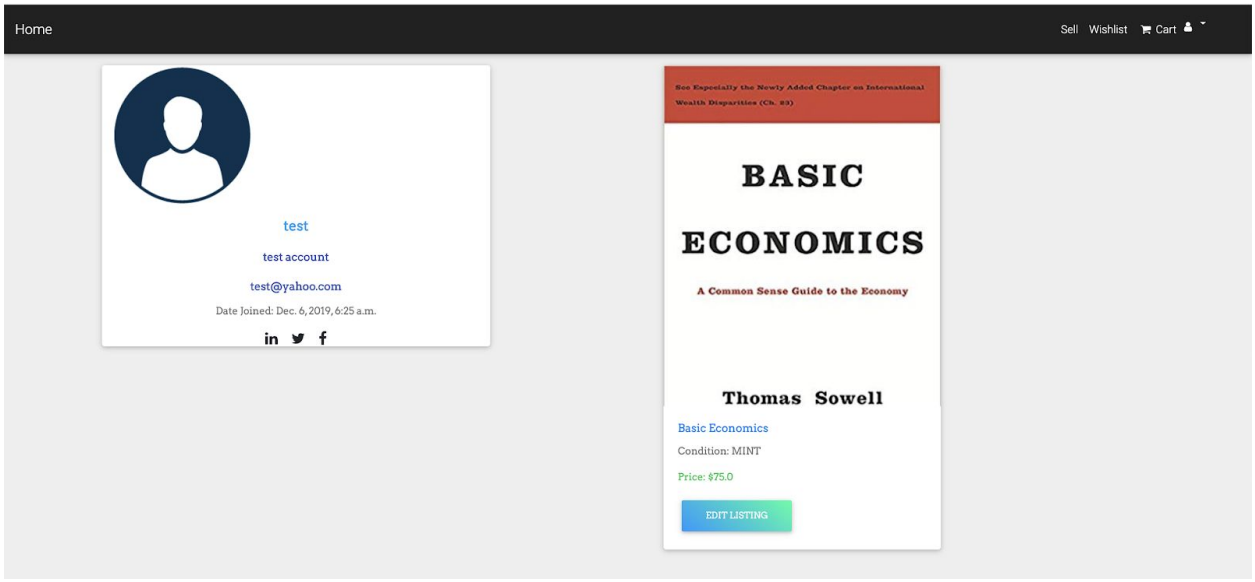
Second step of the checkout form, input your billing address and credit cards information



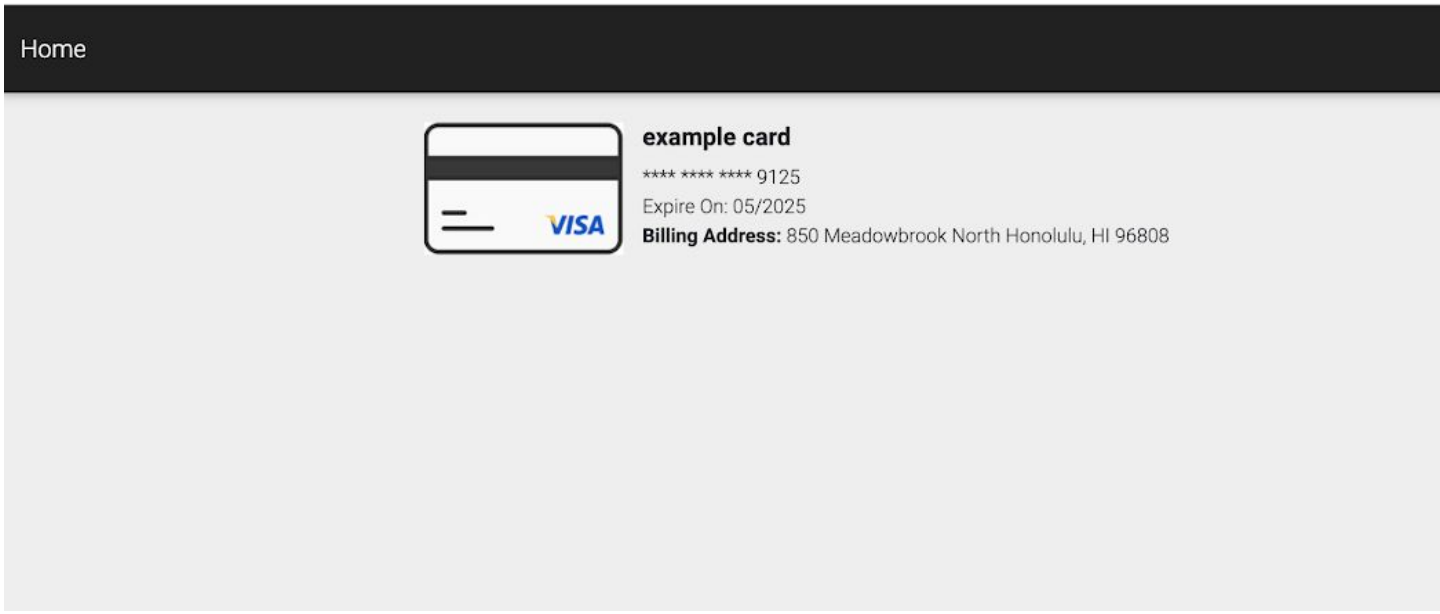
Last step of the checkout form, you can review your order summary and click the red Place Order button to submit your order.



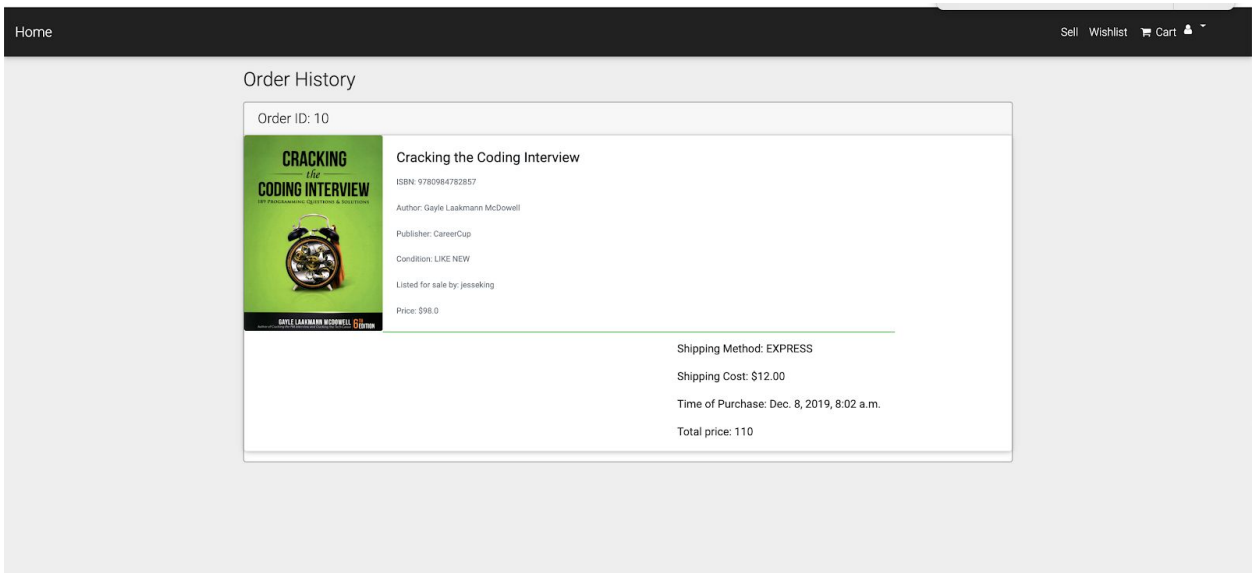
Clicking on the avatar drop down button on the upper right corner and the Settings option will send you to a page where you can modify your account information



Clicking on the avatar drop down button on the upper right corner and the Profile option will send you to a page where you can see your basic account information and your lists of active listings



Clicking on the avatar drop down button on the upper right corner and the My Credit Cards option will send you to a page where you see the credit cards saved to your account



Clicking on the avatar drop down button on the upper right corner and the My Orders option will send you to a page where you can view your Order History.

- **SECURITY**

  All of our account passwords are first hashed and then stored in our database.

  Our MySQL queries are all sanitized to prevents MySQL injection attacks

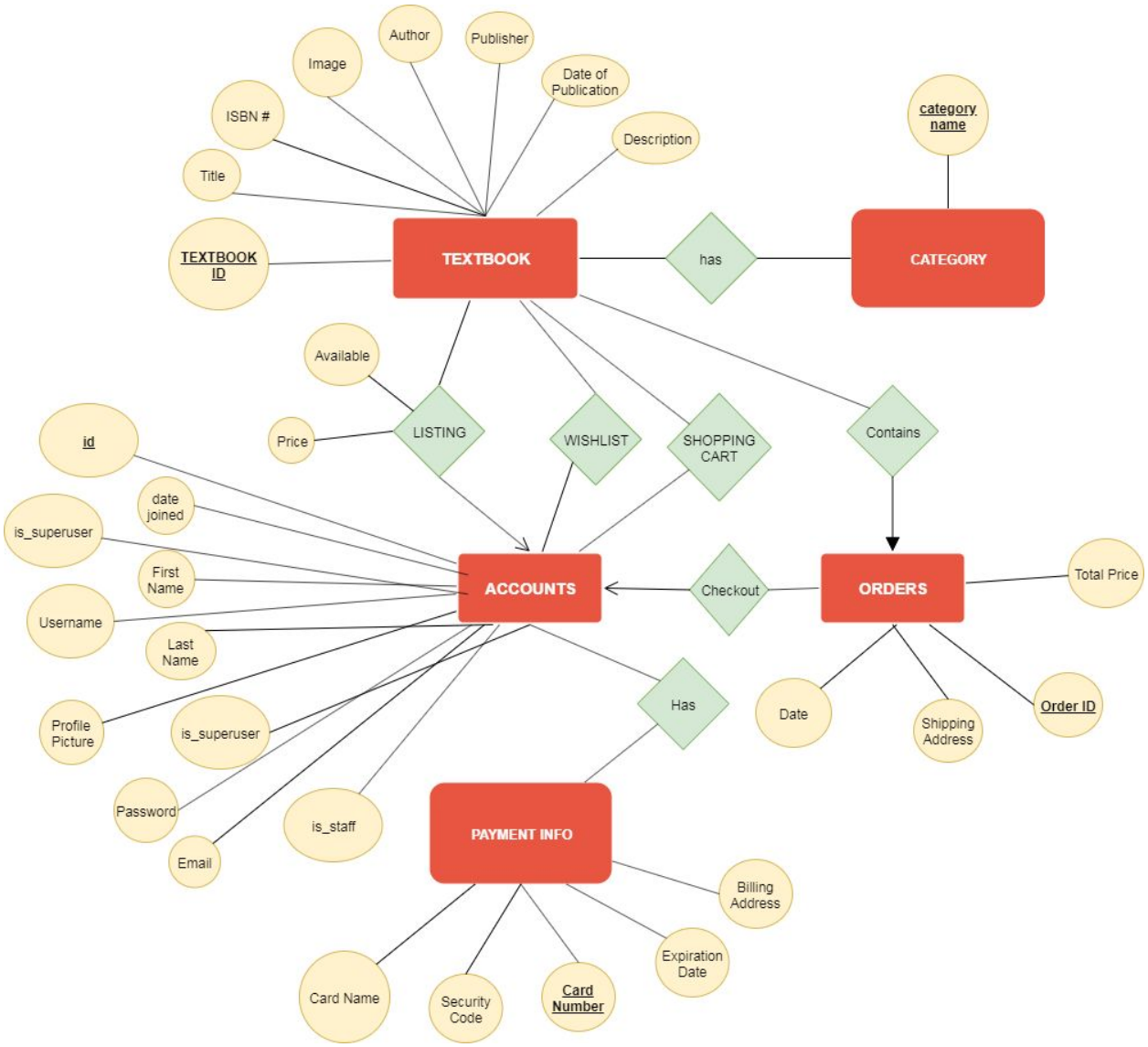
- **ACCESS CONTROL**

- We store the logged in user's information similarly to a session so that features such as editing textbook listing can only be done on listing of their own and our query make sure of that by using the session information in queries.

- Every other URL besides the login/register page requires the user to be logged in or it will returns a Page Not Found error.

Project Design

a. ERD Model



Entity Sets:

1) Textbook - Entity set representing a textbook. It contains attributes ISBN-13 #, Title, Image, Author, Publisher, Year of Publication, Description. It has an auto-increment primary key textbook_ID

2) Category - An entity set representing a category that a textbook belongs to. It has an auto-increment primary key category_id and attribute category name.

3) Orders - an entity set representing a transaction/order made (order histories). It contains auto-increment key Order ID, Date, and Shipping Address attribute.

4) Accounts - An entity set representing the account of the users of our application. It contains attributes is_superuser, is_staff, is_active, Password, Email, Profile Picture, Name, Username and primary key id

5) Payment Info is an entity set representing a credit/debit card users used to pay for transactions. It contains attributes Card Owner(Name), Security Code, Card Type, Expiration Date, Billing Address and primary key is the 16-digit Card Number.

Relationships:

- **b.** Listing is a many-to-one relationship between Accounts and Textbooks. Each user would be able to add many textbook listings for sale and each textbook can only points to 1 account. It has an attribute Available which serves as a boolean field. If Available = 1, then the listing is still available for sale. If Available = 0, the listing has been sold already and is no longer available for sale.
- **c.** Wishlist is a many-to-many relationship between Accounts and Textbooks. Each user would be able to add many textbooks to their wishlist and each textbooks could be in many users' wishlist.
- **d.** Checkout is a many-to-one relationship between Accounts and Order. The user would be able to checkout many orders while each order must be bind to 1 account.
- **e.** Between Orders and Textbooks, there is a many-to-one relationship Contains where an order can contain multiple textbooks while each textbook can only belong to 1 order.
- **f.** Between Textbook and Category, the many-to-many relationship Has represents that 1 category can have many textbooks and many textbooks can belong to many different categories.
- **g.** Between Accounts and PaymentInfo, the many-to-many relationship Has represents that 1 account can have multiple payment methods and 1 credit card can be used for transactions in multiple accounts.

Constraints:

Django doesn't allow composite primary keys (multi-columns primary key) so instead it Adds a default auto-increment field id as primary key for the relationships table. I Adds a constraint to these relationship tables for example Listing so that Account_id And Textbook_id must be unique together in every row so they behaves the same as a Primary key. Then in my queries I never use the auto-increment field id and instead just Use textbook_id and account_id without worrying about duplicates etc.

h. Normalization Process

FDs:

Account

Id -> username, profile_picture, email, password, first name, last name, is_superuser, is_staff, is_active

Textbook

Textbook_id -> Title, ISBN #, Image, Author, Publisher, Date of Publication, Description

Category

No FDs

Orders

Order_ID -> Total Price, Shipping Address, Date Purchased

PaymentInfo

Card Number -> Card Name, Security Code, Billing Address, Expiration Date

Listing relationship

Account_id, Textbook_id -> Price, Available

Based on the FDs above, the tables all satisfy BCNF therefore it is not necessary To perform the normalization process.

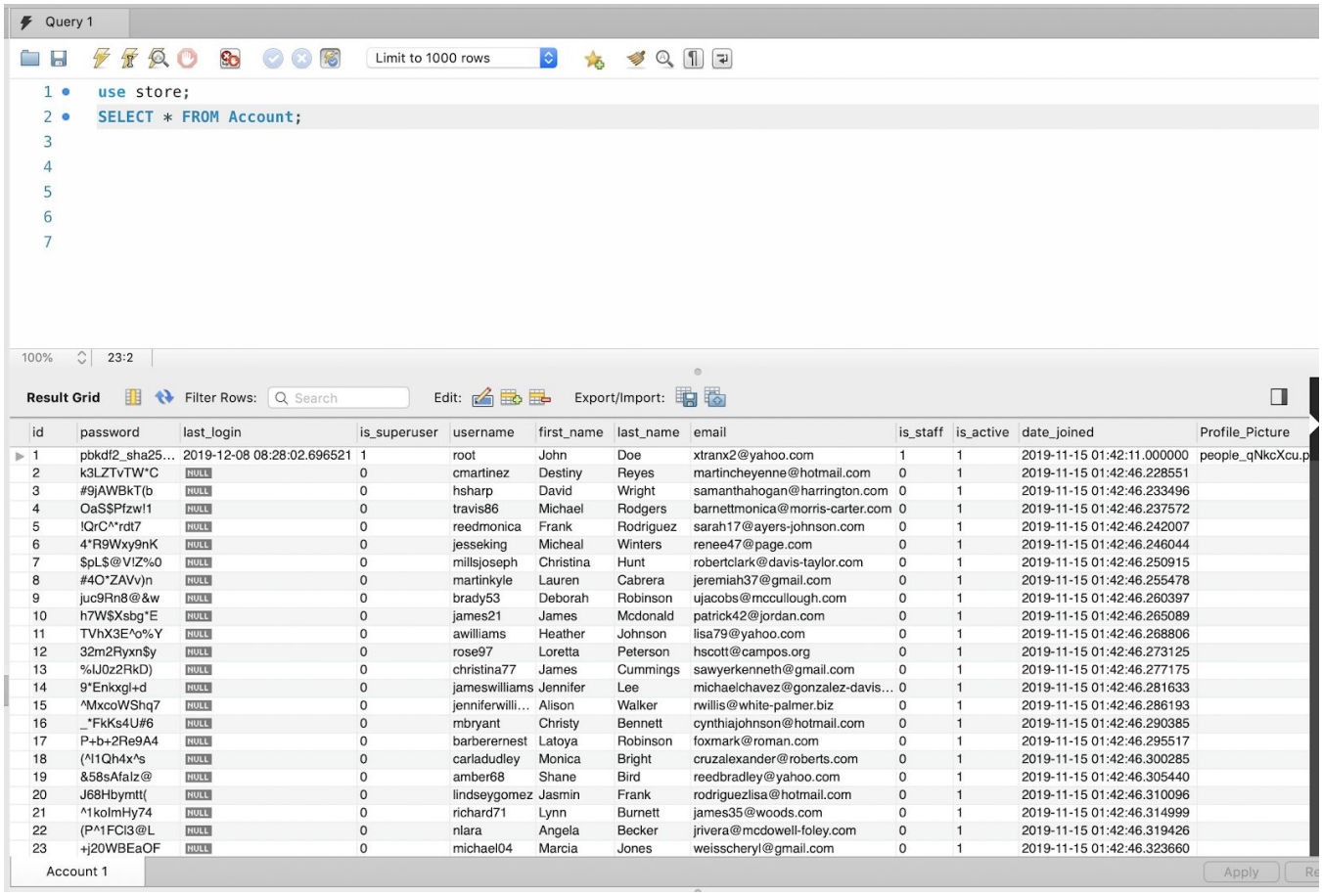
i. Table Schema and Database Models

We are using Django as part of our 3 tier architecture and unfortunately Django comes with an ORM that implements a database table as an object in Python. This mean that I have to specify my schemas as classes in Python and Django will automatically convert the classes into MySQL tables and each object instance I created will be converted to a new table instance in MySQL database.

1.) The problem is that Django does not support the use of composite primary key. It requires that only 1 column can be primary key maximum. Therefore, in the tables that represent relationship Django automatically add a field id as the auto-increment primary key. For example, relationship Wishlist is a relationship that connects entity set Account and Textbook. The table for Wishlist will become Wishlist(**id,** Account_key, Textbook_key). **However, Django lets me add a constraint specifying that no instances of Wishlist can have the same Account_key and Textbook_key so it behave the same as a primary key. The only setback is that those relationship will have a mandatory auto-increment primary key id, the behavior will be the same.**
2.) Django automates the conversion of my schemas into Database tables. However, the naming convention can be a little disambiguous. In Account table, id is the primary key and in other relationships that contain the primary key of Account it is stored as Account_id.
3.) Account table has extra fields that Django automatically adds to it because it recognize Account table as the user model. These fields aren't listed in E/R or database queries because they aren't used at all.
4.) When converting schemas to database tables with Django, it also creates other table such as Admin and admin_auth_permission that are not used at all in our application so we didn't list them.

IMPORTANT

The database queries below are not taken all at the same time. A textbook may exists in some Account's Wishlist or Shopping Cart in the below screenshots even though in the Listing table the availability equals 0 (sold already not available for sale) because I did not screenshot the Wishlist and Shopping Cart table before I checkout some orders and then I took a screenshot of Listing table.



id	password	last_login	is_superuser	username	first_name	last_name	email	is_staff	is_active	date_joined	Profile_Picture
1	pbkdf2_sha25…	2019-12-08 08:28:02.696521	1	root	John	Doe	xtranx2@yahoo.com	1	1	2019-11-15 01:42:11.000000	people_qNkcXcu.p
2	k3LZTvTW*C	NULL	0	cmartinez	Destiny	Reyes	martincheyenne@hotmail.com	0	1	2019-11-15 01:42:46.228551	
3	#9jAWBkT(b	NULL	0	hsharp	David	Wright	samanthahogan@harrington.com	0	1	2019-11-15 01:42:46.233496	
4	OaS$Pfzw!1	NULL	0	travis86	Michael	Rodgers	barnettmonica@morris-carter.com	0	1	2019-11-15 01:42:46.237572	
5	!QrC^*rdt7	NULL	0	reedmonica	Frank	Rodriguez	sarah17@ayers-johnson.com	0	1	2019-11-15 01:42:46.242007	
6	4*R9Wxy9nK	NULL	0	jesseking	Micheal	Winters	renee47@page.com	0	1	2019-11-15 01:42:46.246044	
7	pL@VIZ%0	NULL	0	millsjoseph	Christina	Hunt	robertclark@davis-taylor.com	0	1	2019-11-15 01:42:46.250915	
8	#4O*ZAVv)n	NULL	0	martinkyle	Lauren	Cabrera	jeremiah37@gmail.com	0	1	2019-11-15 01:42:46.255478	
9	juc9Rn8@&w	NULL	0	brady53	Deborah	Robinson	ujacobs@mccullough.com	0	1	2019-11-15 01:42:46.260397	
10	h7W$Xsbg*E	NULL	0	james21	James	Mcdonald	patrick42@jordan.com	0	1	2019-11-15 01:42:46.265089	
11	TVhX3E^o%Y	NULL	0	awilliams	Heather	Johnson	lisa79@yahoo.com	0	1	2019-11-15 01:42:46.268806	
12	32m2Ryxn$y	NULL	0	rose97	Loretta	Peterson	hscott@campos.org	0	1	2019-11-15 01:42:46.273125	
13	%IJ0z2RkD)	NULL	0	christina77	James	Cummings	sawyerkenneth@gmail.com	0	1	2019-11-15 01:42:46.277175	
14	9*Enkxgl+d	NULL	0	jameswilliams	Jennifer	Lee	michaelchavez@gonzalez-davis…	0	1	2019-11-15 01:42:46.281633	
15	^MxcoWShq7	NULL	0	jenniferwilli…	Alison	Walker	rwillis@white-palmer.biz	0	1	2019-11-15 01:42:46.286193	
16	_*FkKs4U#6	NULL	0	mbryant	Christy	Bennett	cynthiajohnson@hotmail.com	0	1	2019-11-15 01:42:46.290385	
17	P+b+2Re9A4	NULL	0	barberernest	Latoya	Robinson	foxmark@roman.com	0	1	2019-11-15 01:42:46.295517	
18	(^l1Qh4x^s	NULL	0	carladudley	Monica	Bright	cruzalexander@roberts.com	0	1	2019-11-15 01:42:46.300285	
19	&58sAfaIz@	NULL	0	amber68	Shane	Bird	reedbradley@yahoo.com	0	1	2019-11-15 01:42:46.305440	
20	J68Hbymtt(	NULL	0	lindseygomez	Jasmin	Frank	rodriguezlisa@hotmail.com	0	1	2019-11-15 01:42:46.310096	
21	^1kolmHy74	NULL	0	richard71	Lynn	Burnett	james35@woods.com	0	1	2019-11-15 01:42:46.314999	
22	(P^1FCl3@L	NULL	0	nlara	Angela	Becker	jrivera@mcdowell-foley.com	0	1	2019-11-15 01:42:46.319426	
23	+j20WBEaOF	NULL	0	michael04	Marcia	Jones	weisscheryl@gmail.com	0	1	2019-11-15 01:42:46.323660	

Figure 1

Figure 1 Accounts(**<u>id</u>**, Username, last_login, is_superuser, is_staff, is_active, date_joined Profile_Picture, Password, Email, Name)

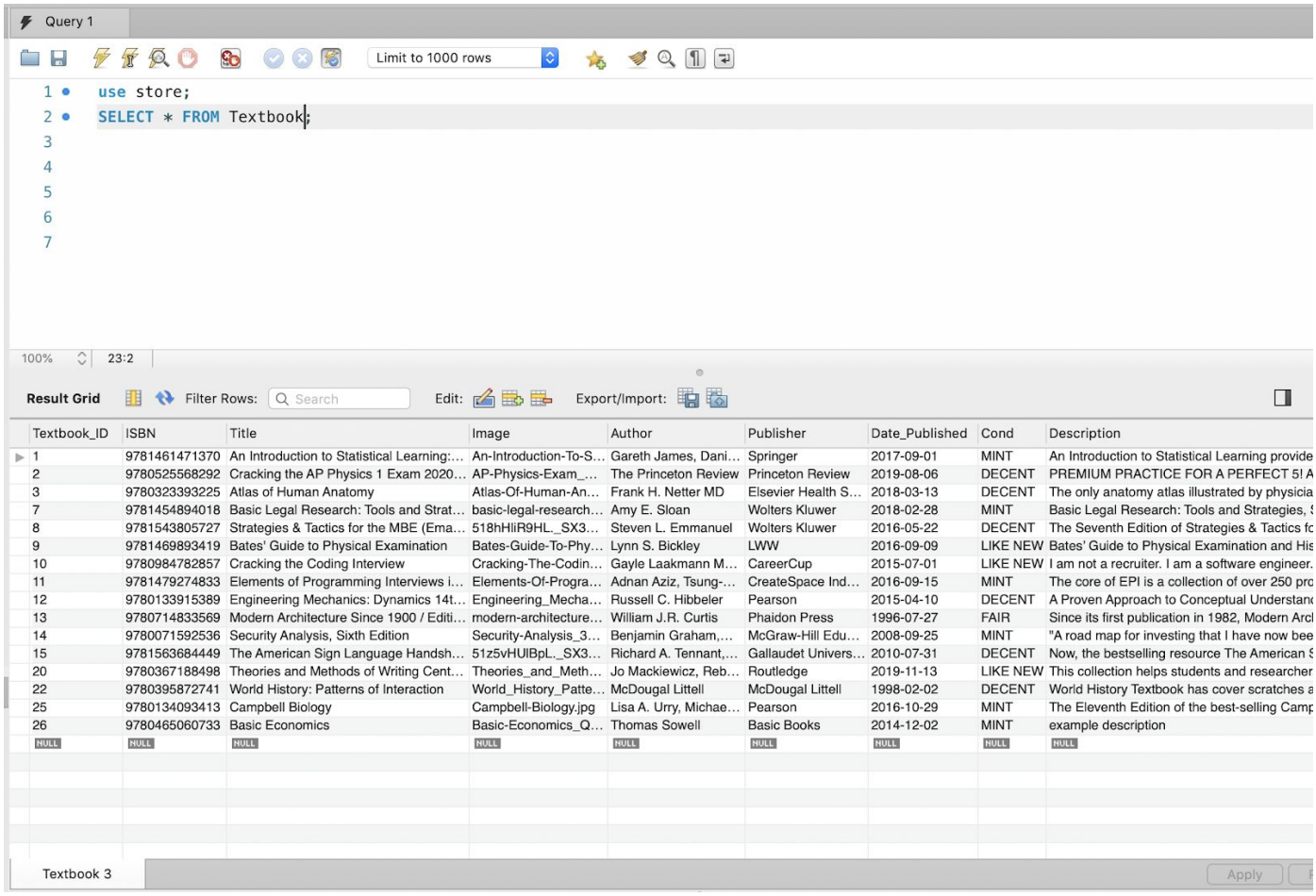
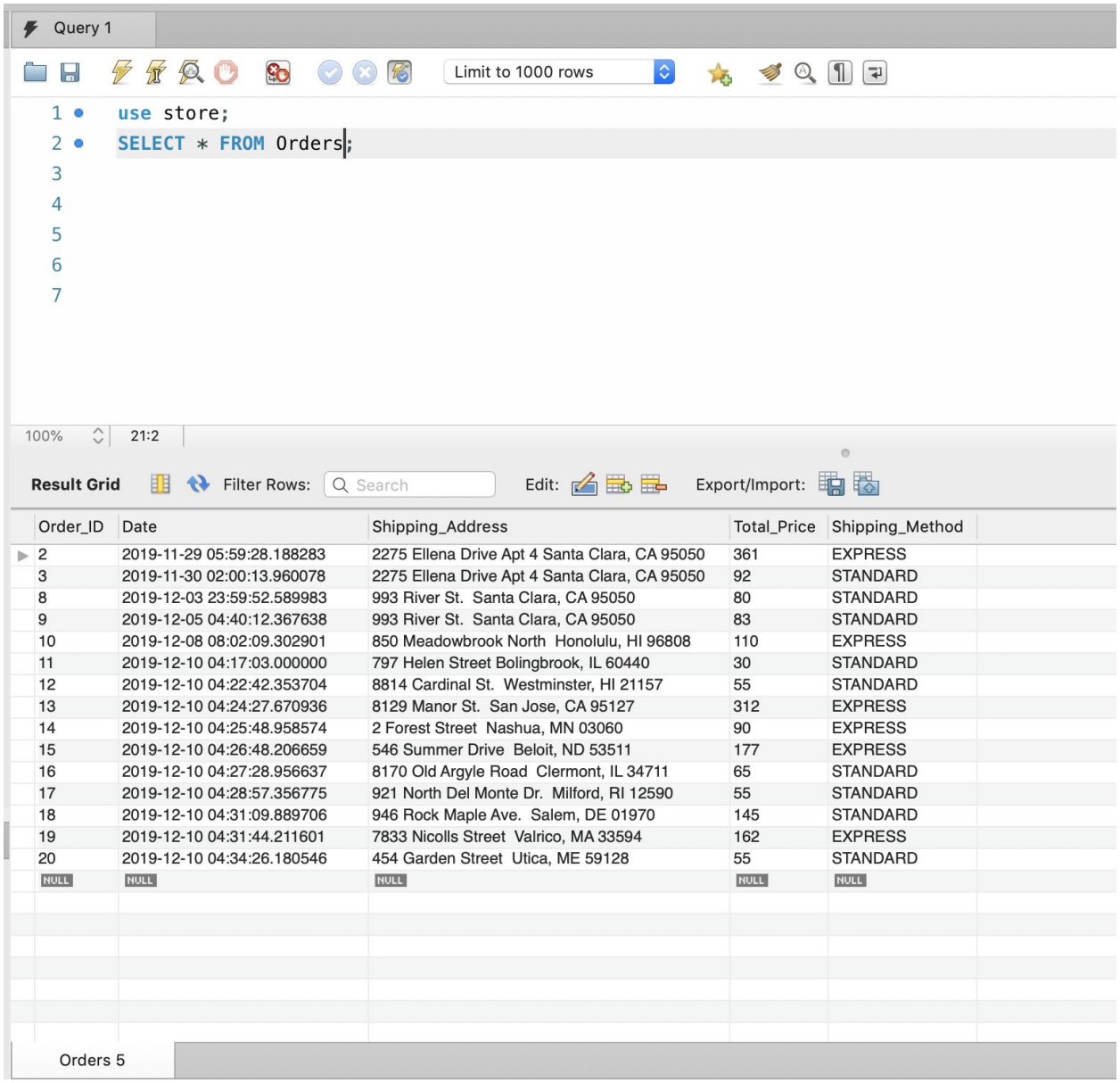


Figure 2

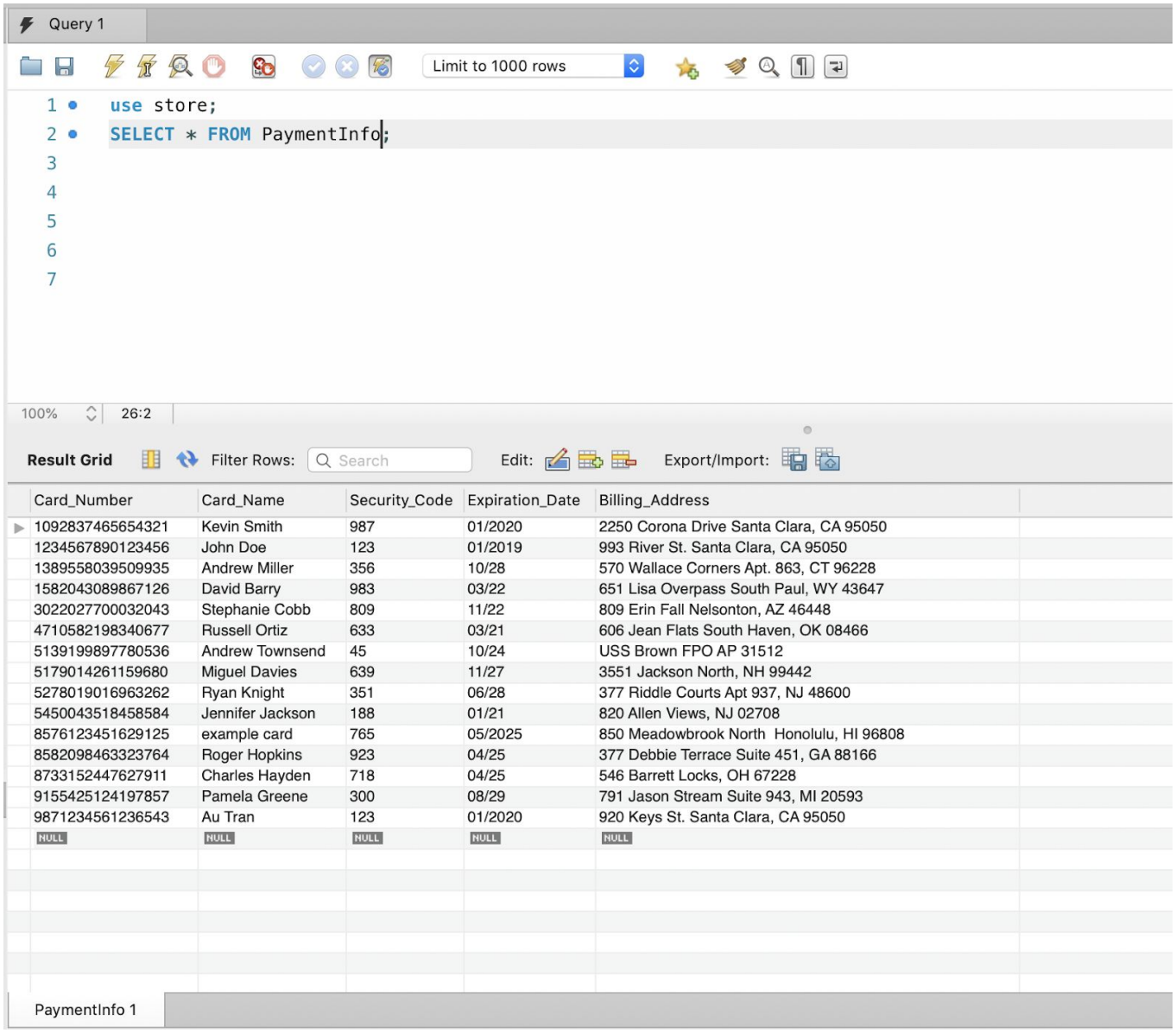
Figure 2 Textbook(**Textbook_ID**, ISBN, Title, Image, Author, Publisher, Date_Published, Condition, Description)



Order_ID	Date	Shipping_Address	Total_Price	Shipping_Method
2	2019-11-29 05:59:28.188283	2275 Ellena Drive Apt 4 Santa Clara, CA 95050	361	EXPRESS
3	2019-11-30 02:00:13.960078	2275 Ellena Drive Apt 4 Santa Clara, CA 95050	92	STANDARD
8	2019-12-03 23:59:52.589983	993 River St. Santa Clara, CA 95050	80	STANDARD
9	2019-12-05 04:40:12.367638	993 River St. Santa Clara, CA 95050	83	STANDARD
10	2019-12-08 08:02:09.302901	850 Meadowbrook North Honolulu, HI 96808	110	EXPRESS
11	2019-12-10 04:17:03.000000	797 Helen Street Bolingbrook, IL 60440	30	STANDARD
12	2019-12-10 04:22:42.353704	8814 Cardinal St. Westminster, HI 21157	55	STANDARD
13	2019-12-10 04:24:27.670936	8129 Manor St. San Jose, CA 95127	312	EXPRESS
14	2019-12-10 04:25:48.958574	2 Forest Street Nashua, MN 03060	90	EXPRESS
15	2019-12-10 04:26:48.206659	546 Summer Drive Beloit, ND 53511	177	EXPRESS
16	2019-12-10 04:27:28.956637	8170 Old Argyle Road Clermont, IL 34711	65	STANDARD
17	2019-12-10 04:28:57.356775	921 North Del Monte Dr. Milford, RI 12590	55	STANDARD
18	2019-12-10 04:31:09.889706	946 Rock Maple Ave. Salem, DE 01970	145	STANDARD
19	2019-12-10 04:31:44.211601	7833 Nicolls Street Valrico, MA 33594	162	EXPRESS
20	2019-12-10 04:34:26.180546	454 Garden Street Utica, ME 59128	55	STANDARD
NULL	NULL	NULL	NULL	NULL

Figure 3

Figure 3 Order(**<u>Order_ID</u>**, Date, Shipping_Address, Total_Price, Shipping_Method)



Card_Number	Card_Name	Security_Code	Expiration_Date	Billing_Address
1092837465654321	Kevin Smith	987	01/2020	2250 Corona Drive Santa Clara, CA 95050
1234567890123456	John Doe	123	01/2019	993 River St. Santa Clara, CA 95050
1389558039509935	Andrew Miller	356	10/28	570 Wallace Corners Apt. 863, CT 96228
1582043089867126	David Barry	983	03/22	651 Lisa Overpass South Paul, WY 43647
3022027700032043	Stephanie Cobb	809	11/22	809 Erin Fall Nelsonton, AZ 46448
4710582198340677	Russell Ortiz	633	03/21	606 Jean Flats South Haven, OK 08466
5139199897780536	Andrew Townsend	45	10/24	USS Brown FPO AP 31512
5179014261159680	Miguel Davies	639	11/27	3551 Jackson North, NH 99442
5278019016963262	Ryan Knight	351	06/28	377 Riddle Courts Apt 937, NJ 48600
5450043518458584	Jennifer Jackson	188	01/21	820 Allen Views, NJ 02708
8576123451629125	example card	765	05/2025	850 Meadowbrook North Honolulu, HI 96808
8582098463323764	Roger Hopkins	923	04/25	377 Debbie Terrace Suite 451, GA 88166
8733152447627911	Charles Hayden	718	04/25	546 Barrett Locks, OH 67228
9155425124197857	Pamela Greene	300	08/29	791 Jason Stream Suite 943, MI 20593
9871234561236543	Au Tran	123	01/2020	920 Keys St. Santa Clara, CA 95050
NULL	NULL	NULL	NULL	NULL

Figure 4

Figure 4 PaymentInfo(**Card_Number**, Card_Name, Security_Code, Expiration_Date, Billing_Address)

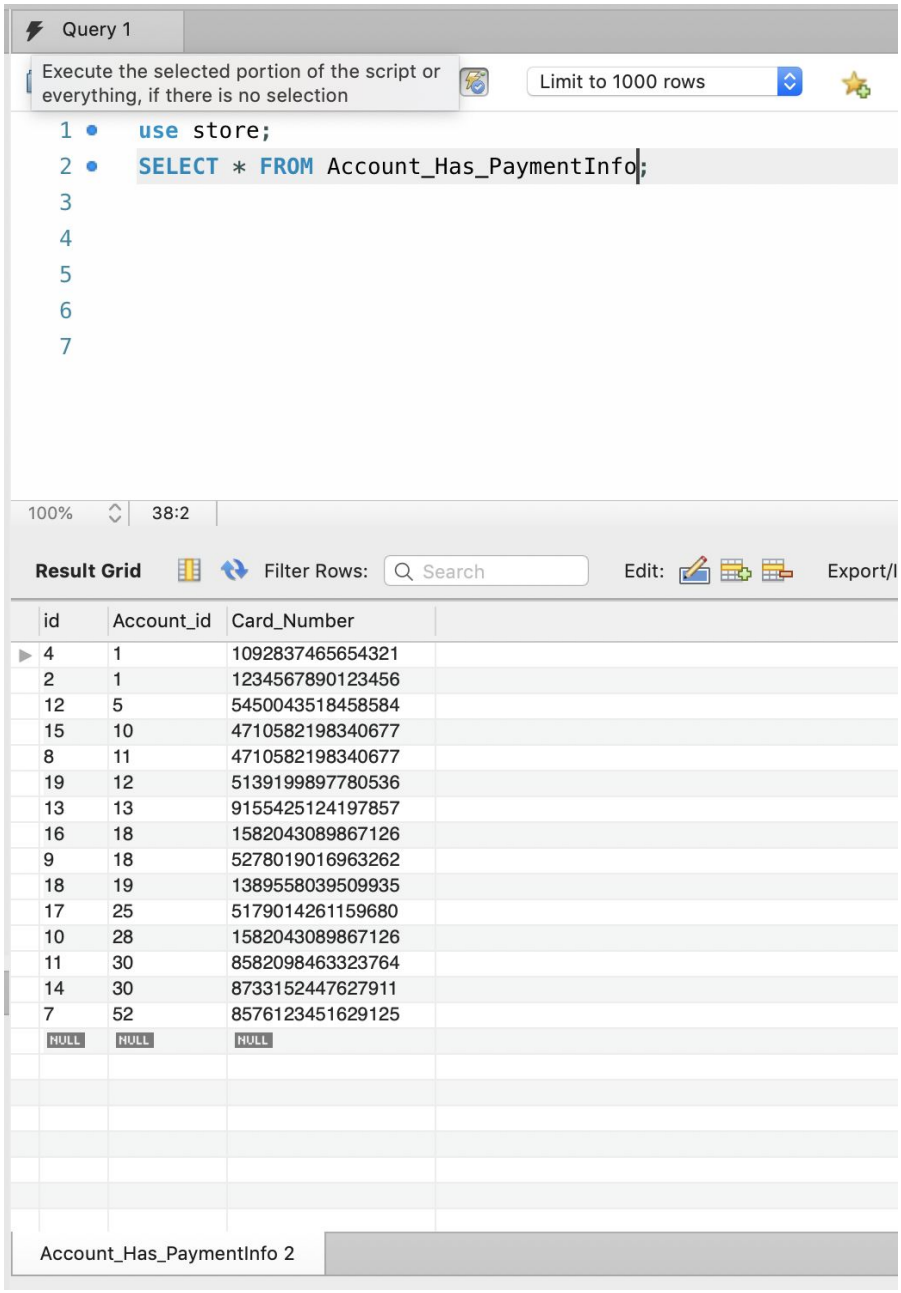


Figure 5

Figure 5 Account_Has_PaymentInfo(**id**, Account_id, Card_Number)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that let Account_id and Card_Number must be unique together in every row so it behaves like a primary key.

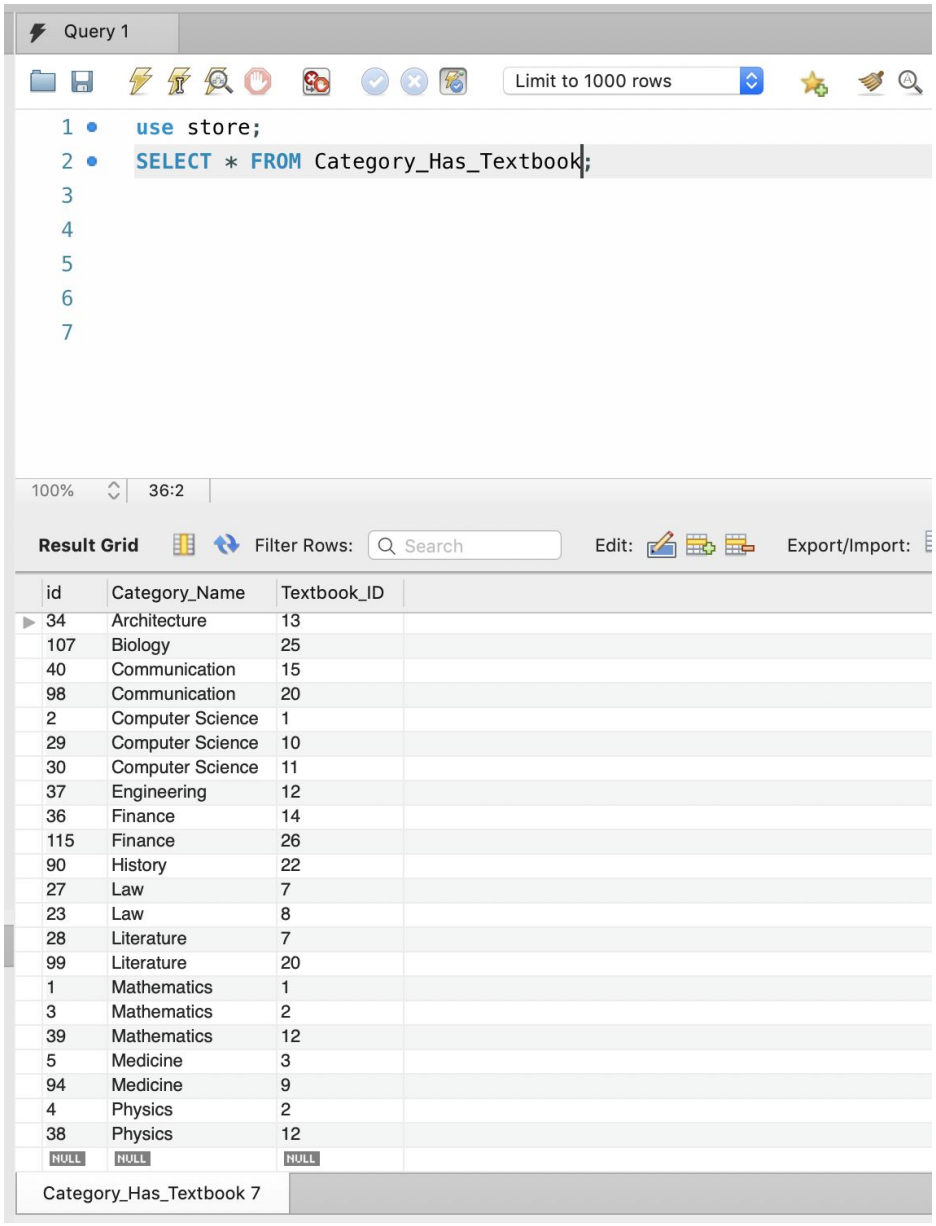


Figure 6

Figure 6 Category_Has_Textbook(**id**, Category_Name, Textbook_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Category_Name and Textbook_id must be unique together in every row so it behaves like a primary key.

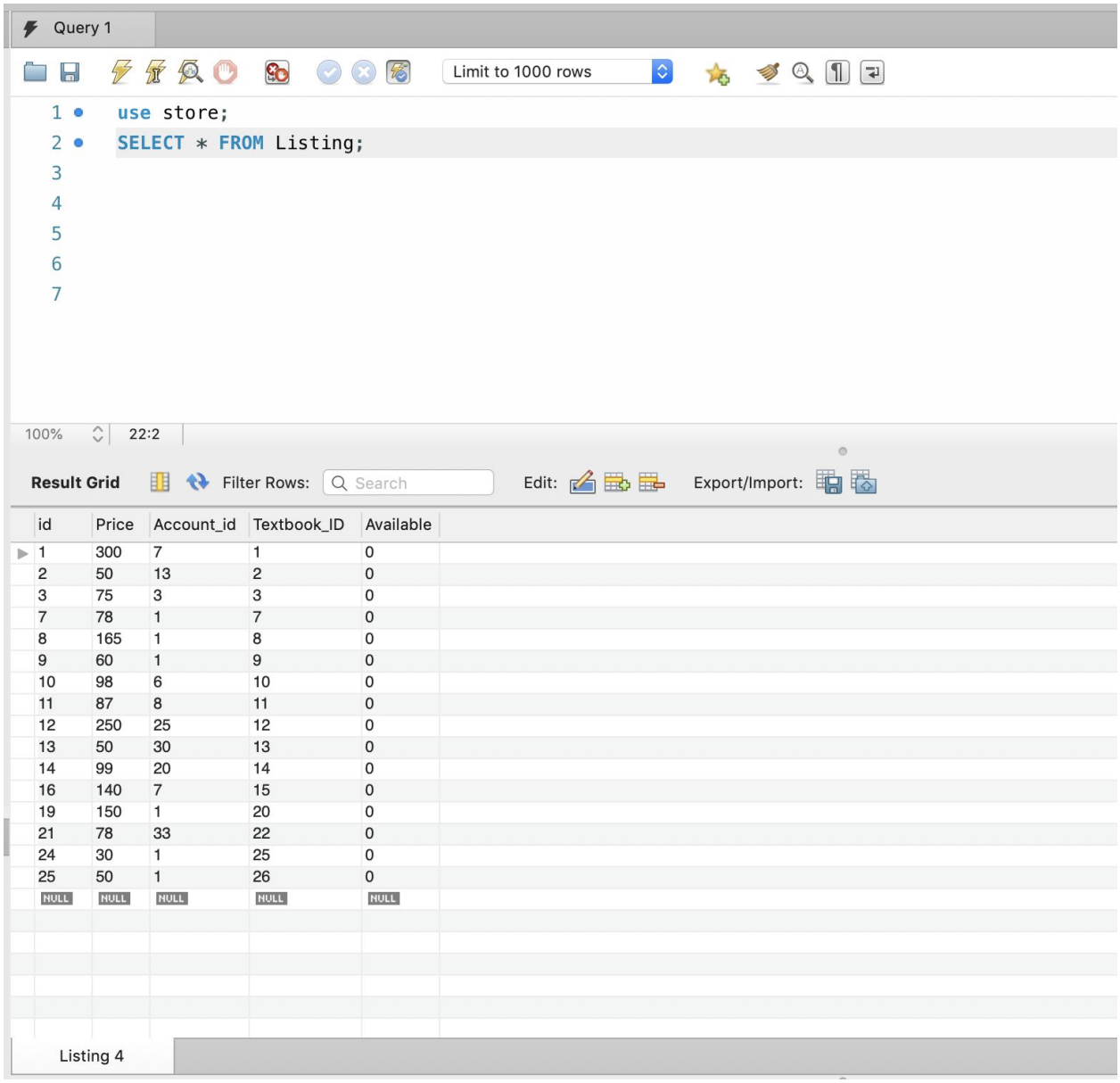


Figure 7

Figure 7 Listing(**id**, Price, Account_id, Textbook_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Account_id and Textbook_id must be unique together in every row so it behaves like a primary key.

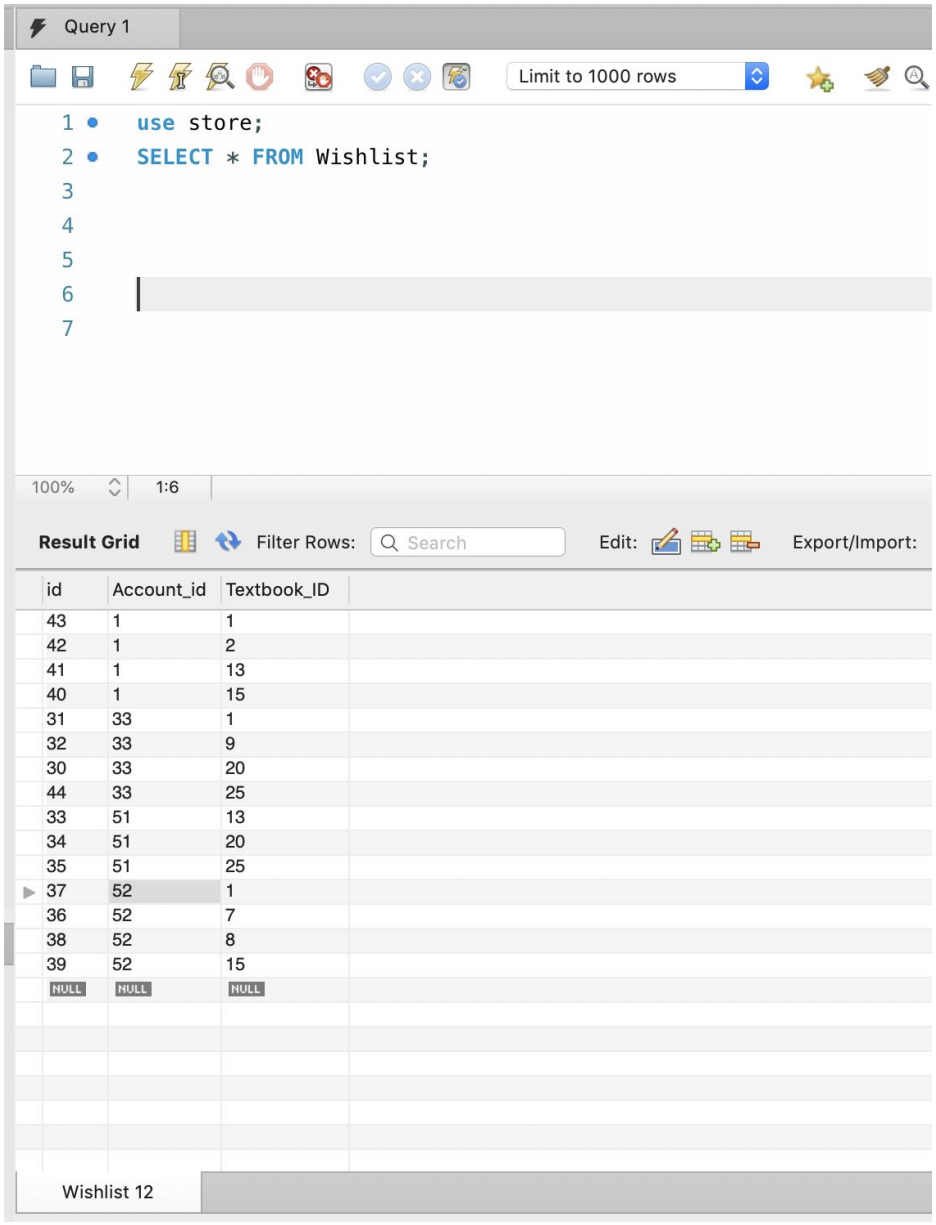


Figure 8

Figure 8 Wishlist(**id**, Account_id, Textbook_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Account_id and Textbook_id must be unique together in every row so it behaves like a primary key.

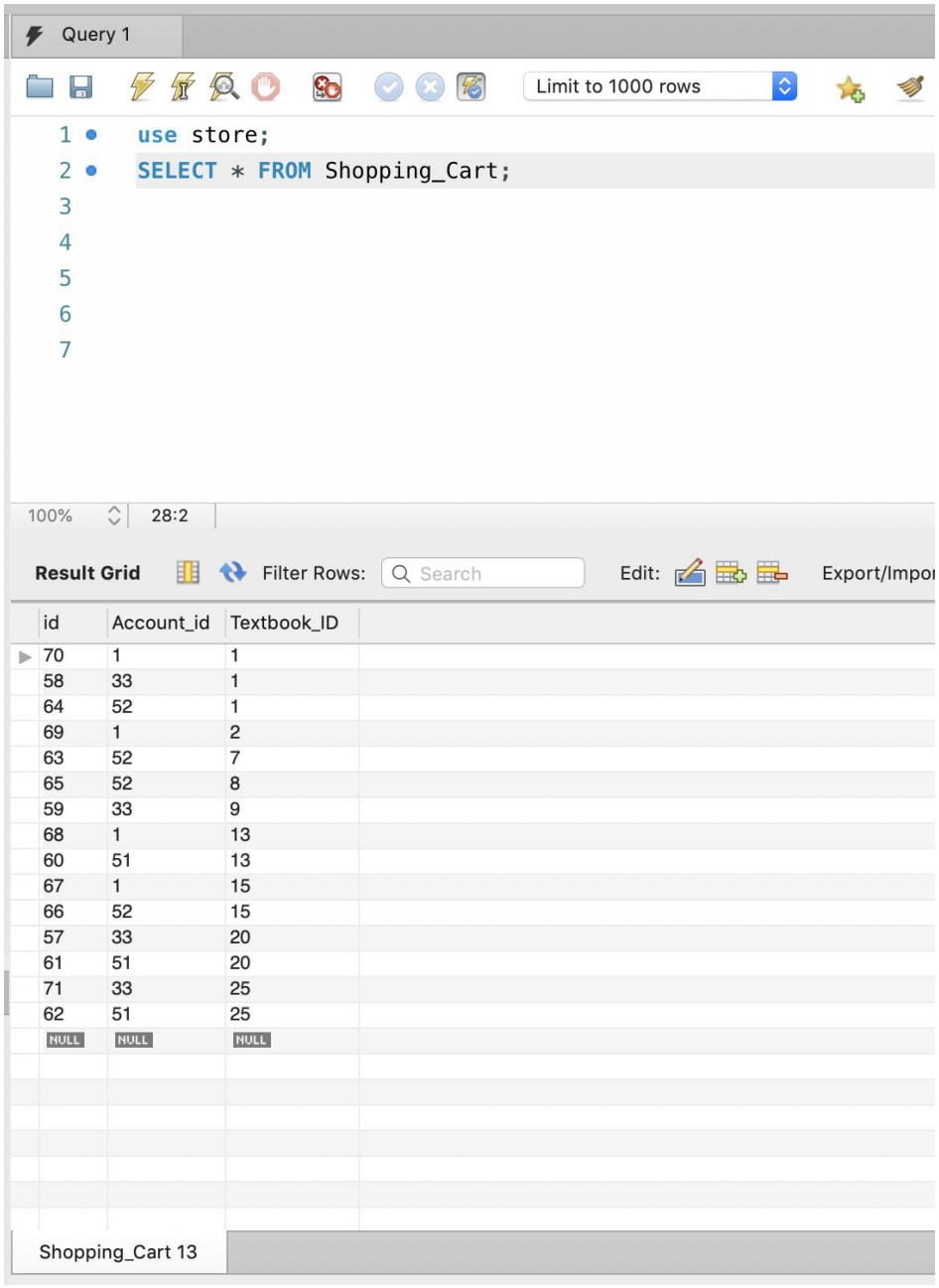


Figure 9

Figure 9 Shopping_Cart(**id**, Account_id, Textbook_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Account_id and Textbook_id must be unique together in every row so it behaves like a primary key.

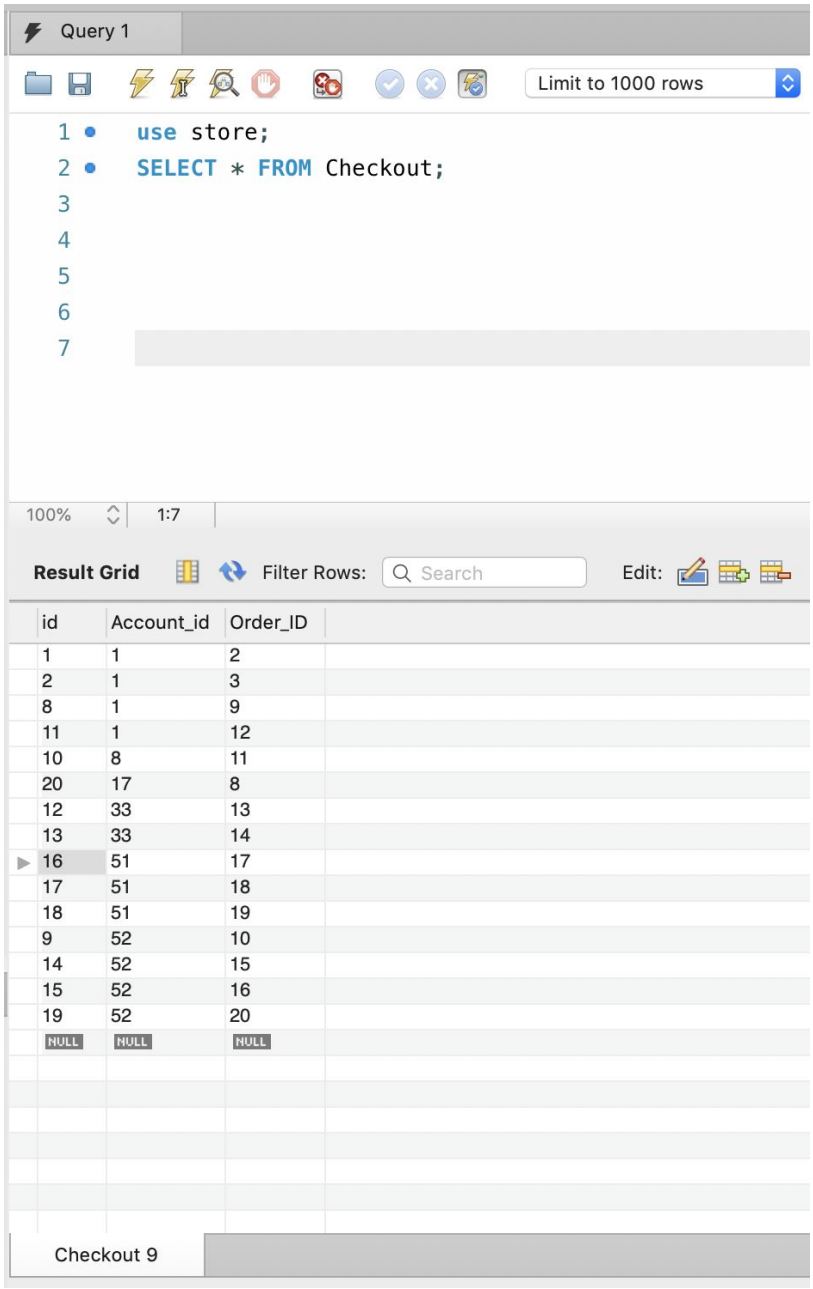


Figure 10

Figure 10 Checkout(**id**, Account_id, Order_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Account_id and Order_id must be unique together in every row so it behaves like a primary key.

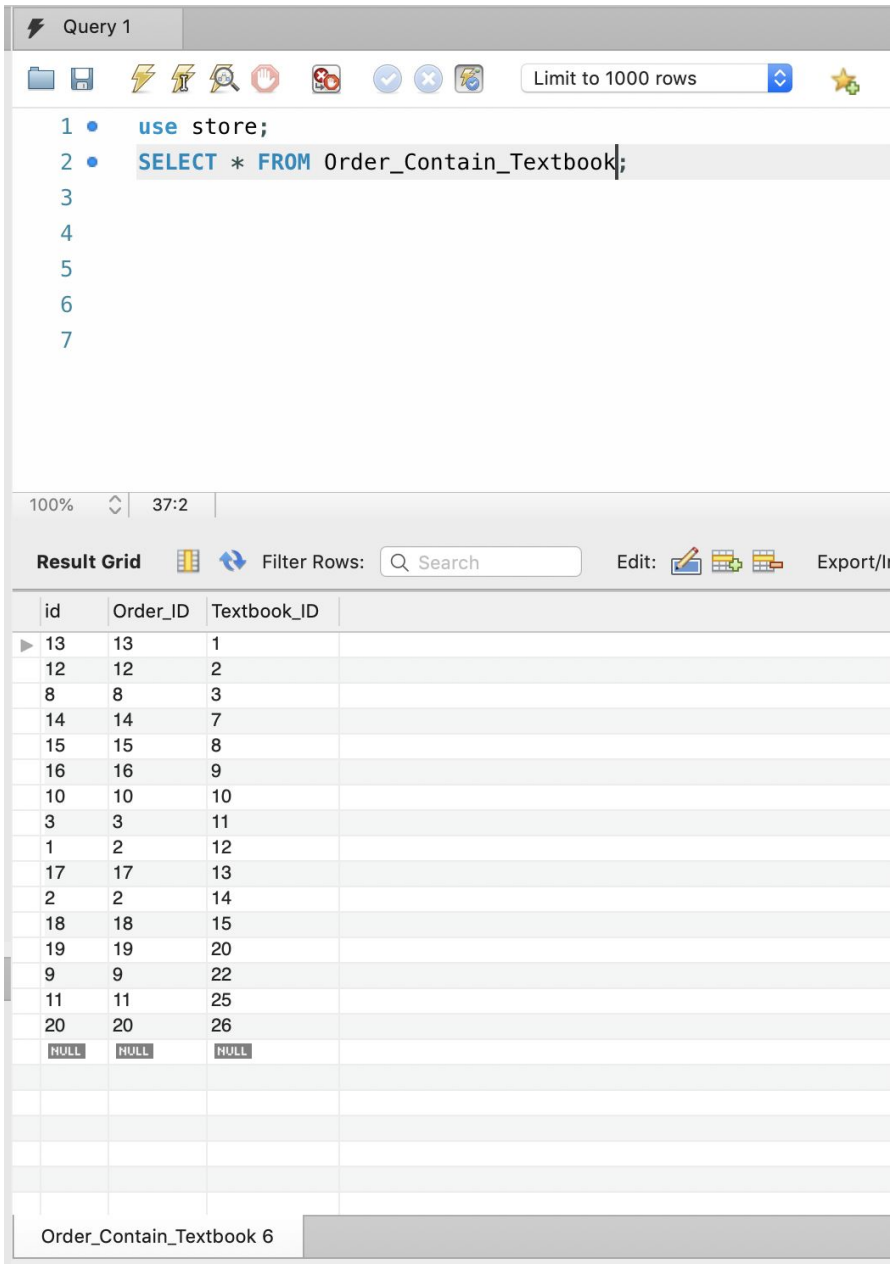


Figure 11

Figure 11 Order_Contain_Textbook(**id**, Order_id, Textbook_id)

This primary key id is an auto-increment field automatically added by Django. It is never used in my queries since I added a constraint that Order_id and Textbook_id must be unique together in every row so it behaves like a primary key.

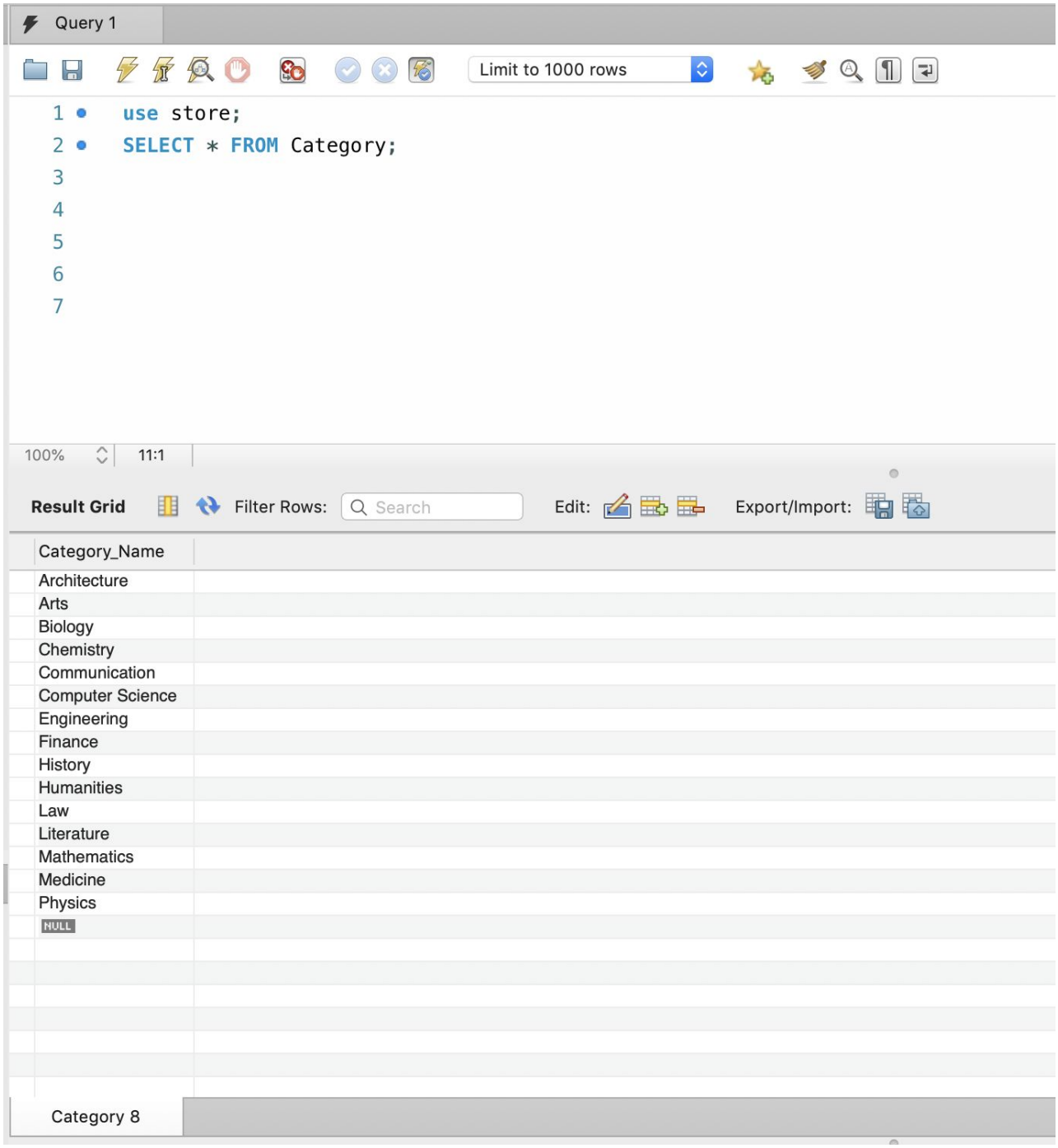


Figure 12

Figure 12 Category(**Category_Name**)

Database Implementation

IMPORTANT:

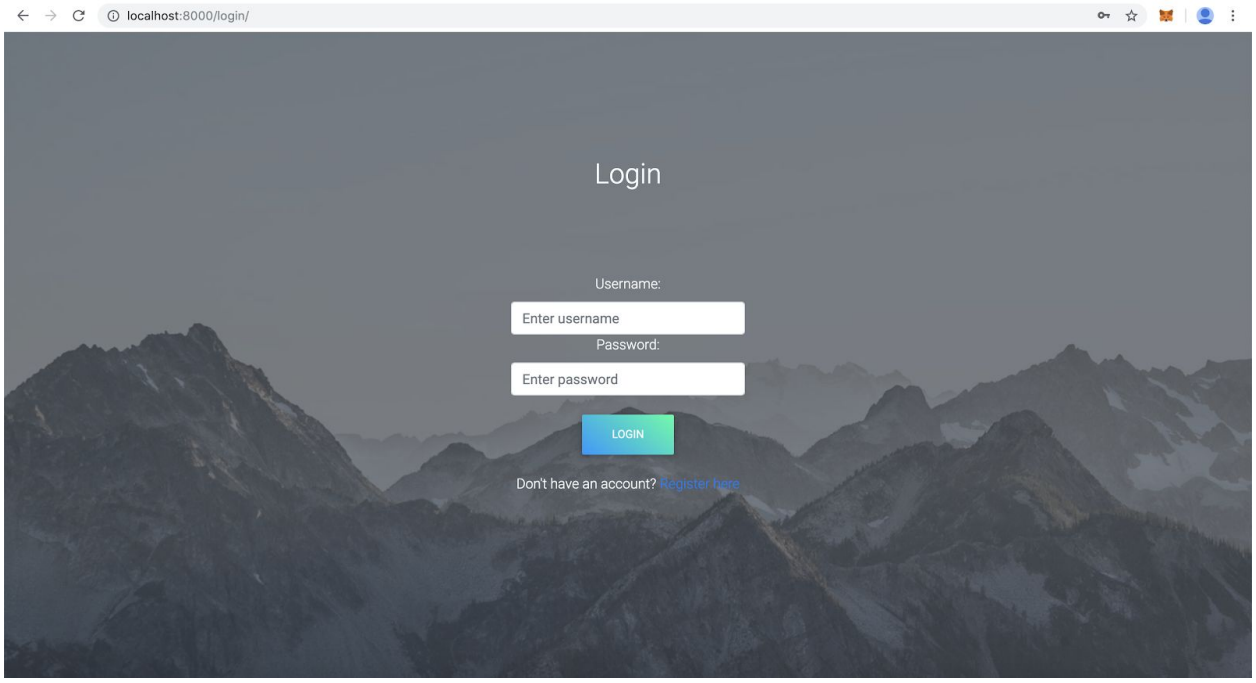
If I am doing a SELECT query statement, in Django I do not need to establish a connection with connection.cursor() and use cursor.execute() to do this query. Django ORM maps a table Account for example to a class Account in Python. Each instance of an Account class is equivalent to a row in table Account. So if I perform a select query on table Account I can invoke

accs = Account.objects.raw("SELECT * FROM Account")

This will return to me a list of Account objects corresponding to the rows returned. I can access the column value username of the first row returned by using accs[0].username for example.

Request.user is similar to a session that stores information about the logged in user. I can access information about the account such as username, id, email, password etc of the logged in user through it.

LOGIN PAGE



Upon starting our application, you will access it by going to localhost:8000 and will be directed to our login page which prompts you to enter your account information.

\

BACKEND LOGIC

```
@require_POST
@csrf_exempt
def login_request(request):
    """
    Process the login request by querying the database for an existing Account given user input
    and returns a JsonResponse to the ajax call

    """

    context = {}
    if request.is_ajax() == True:
        username = request.POST.get("username")
        password = request.POST.get("password")
        if len(Account.objects.raw("SELECT * FROM Account WHERE username = %s", [username])) == 0:
            context['username'] = 'Not found'
            context['password'] = 'Incorrect'
        else:
            context['username'] = 'Found'
            user = authenticate(username=username, password=password)
            if user is None:
                context['password'] = 'Incorrect'
            else:
                auth_login(request, user)
                context['message'] = 'Success';
    return JsonResponse(context)
```

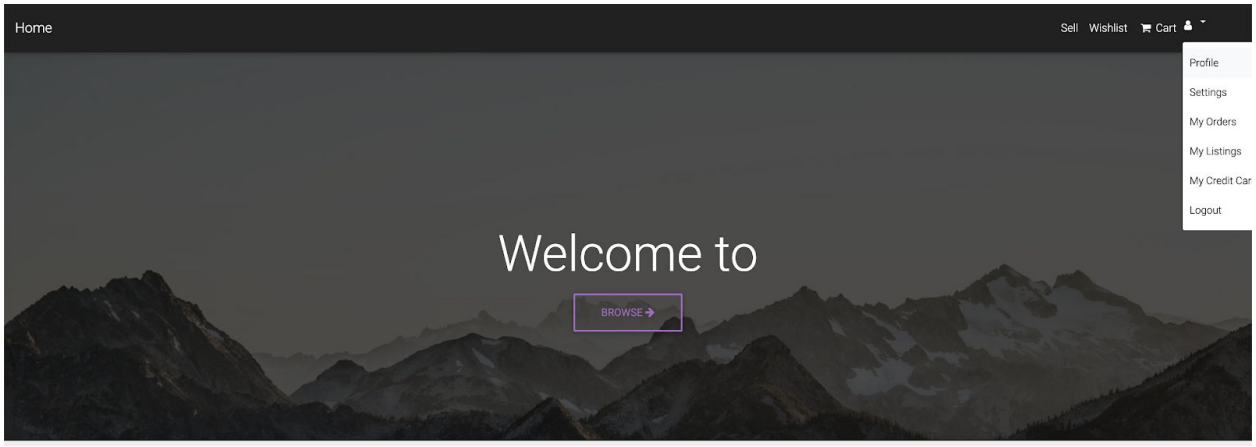
```
if len(Account.objects.raw("SELECT * FROM Account WHERE username = %s", [username]))
== 0:
```

I query the Account table where username = username provided by the user and if the result returns 0 row then I return a message to the view that there exists no account with that login information.

Else if a result is found, I invoke authenticate with the username and password and if it returns me a None object that means the password is incorrect and I return a message saying the password is incorrect.

Otherwise, I logs the user in with auth_login

LOGOUT



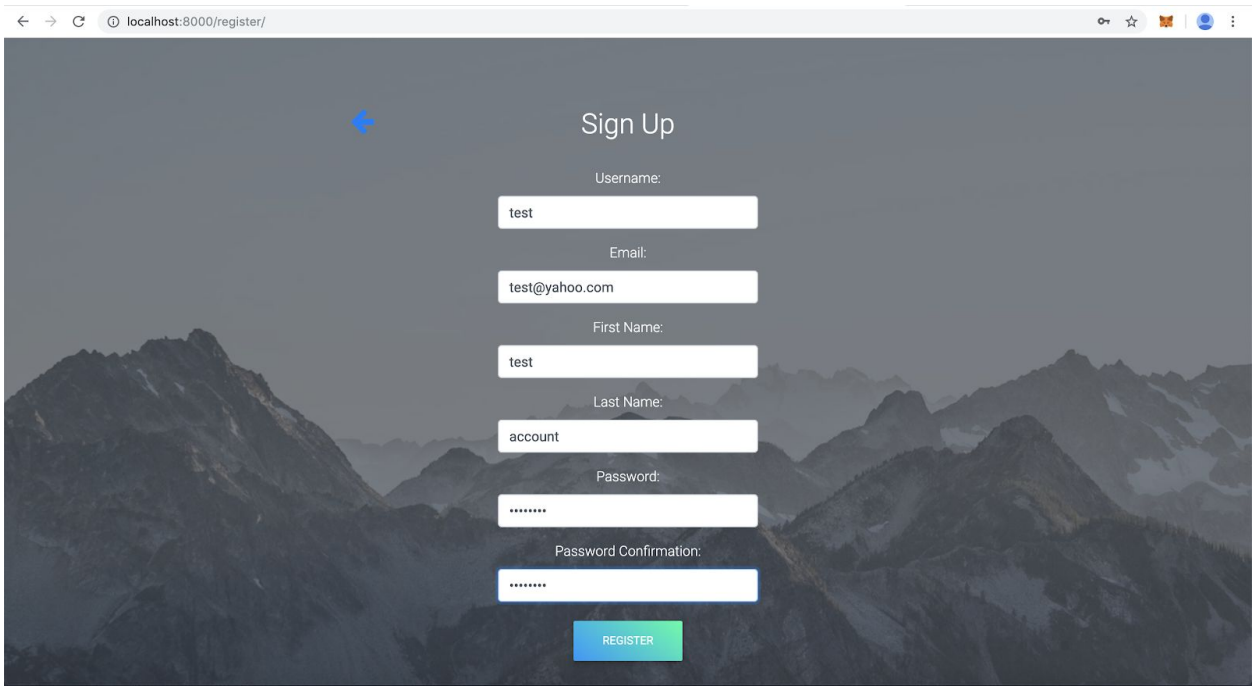
Once you are logged in, you can select the avatar dropdown button on the upper right corner and select Logout button to log out of the application. You will then be redirected to the login page.

```
73  @login_required
74  def logout(request):
75
76      auth_logout(request)
77      return HttpResponseRedirect(reverse('home'))
```

Just invoke auth_logout on the request and the user will be logged out.

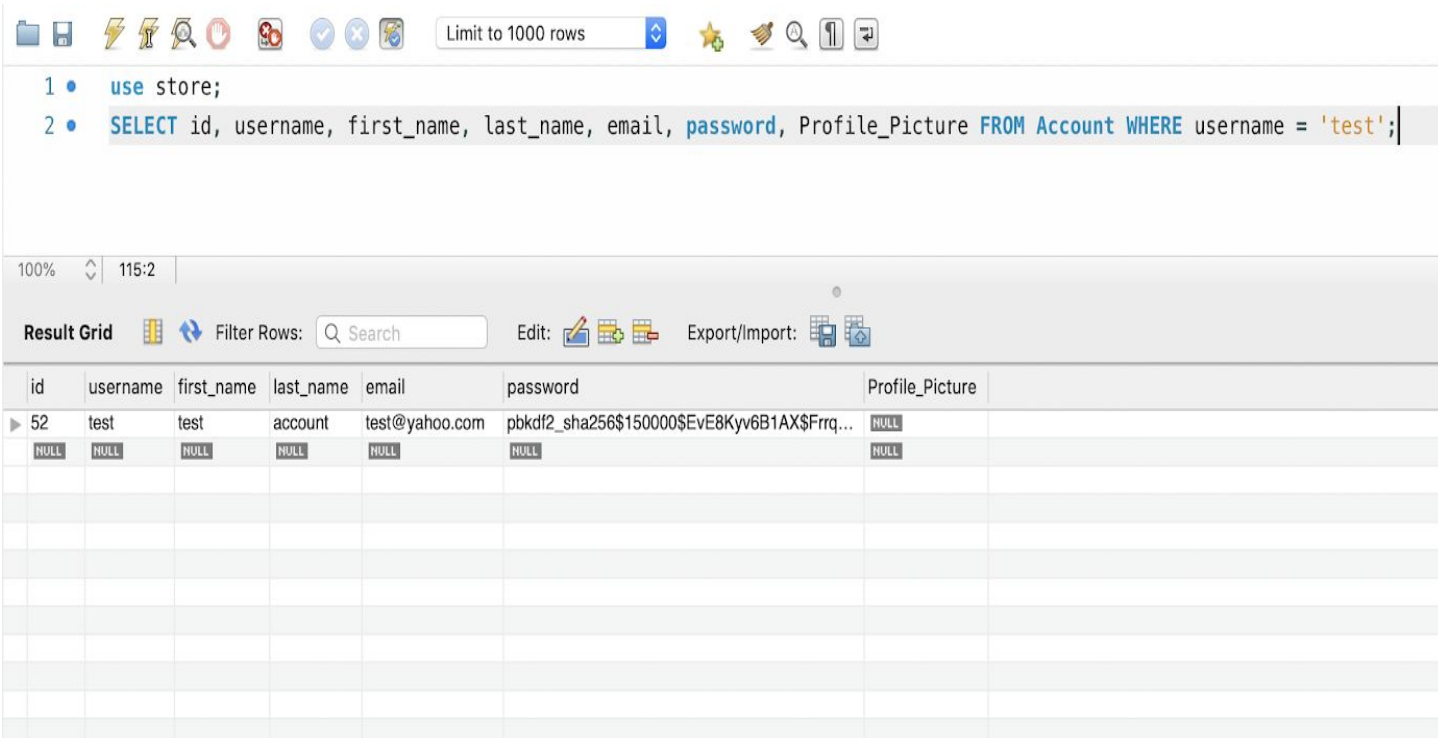
REGISTER AN ACCOUNT

For registering, I will insert a new row into Account table.



If you don't have an account, clicks the Register Button beneath the Login button to be directed to a form for you to sign up.

After clicking the register button, you will automatically be logged in to the application, redirected to the landing page, and your account information will be saved in the database in the Account table. I will go ahead and fill in the information and clicks Register.



As you can see, a new row is inserted into the Account table with the information I just filled out. The Profile Picture column is null because we don't force you to upload a profile picture upon registration. The password is also hashed for security purposes.

BACKEND LOGIC

```python
def register(request):
    # If user is logged in already, redirects to homepage
    if(request.user.is_authenticated):
        return HttpResponseRedirect(reverse('homepage'))

    # This form is used for creating registration form
    form = forms.AccountCreationForm();

    if(request.method == 'POST'):

        form = forms.AccountCreationForm(request.POST)
        # Hashed the user provided password
        password = make_password(request.POST.get('password1'))
        # Query the database to see if there is any account with this username
        # in the database
        get_user_query = "SELECT * FROM Account WHERE username = %s"
        get_user_arguments = [request.POST.get('username')]
        user = Account.objects.raw(get_user_query, get_user_arguments)[:]

        # if the query results return 0 rows then go ahead and make an account
        if len(user) == 0:
            date_joined = datetime.now()
            password = make_password(request.POST.get('password1'))
            add_user_query = """INSERT INTO Account (username, password, email, first_name, last_name, date_joined,
                            is_staff, is_superuser, is_active) VALUES (%s, %s, %s, %s, %s, %s, %s, %s, %s);"""
            add_user_arguments = [request.POST.get('username'), password, request.POST.get('email'), request.POST.get('first_name'),\
                                  request.POST.get('last_name'), date_joined, '1', '1', '1']

            with connection.cursor() as cursor:
                cursor.execute(add_user_query, add_user_arguments)
            connection.close()

            get_user_query = "SELECT * FROM Account WHERE username = %s AND password = %s"
            get_user_arguments.append(password)
            user = Account.objects.raw(get_user_query, get_user_arguments)[0]

            auth_login(request, user);
            request.user.is_superuser = False
            request.user.is_staff = False

            return HttpResponseRedirect(reverse('homepage'))
        else:
            username_exists = True;
            return render(request, 'Register.html',context={'form':form, 'username_exists': username_exists});

    return render(request, 'Register.html',context={'form':form});
```

First, this function checks if the user is already logged in. If so, it redirects the user to the homepage instead.

Then, it hashed the password provided by the user and then query

```
get_user_query = "SELECT * FROM Account WHERE username = %s"
```

This query is done to check if there already exists a user with this username already in the database. If not, go ahead and create a new account. If there already exists an account, return a message to the view and the view will update to tell the username to choose a different username.

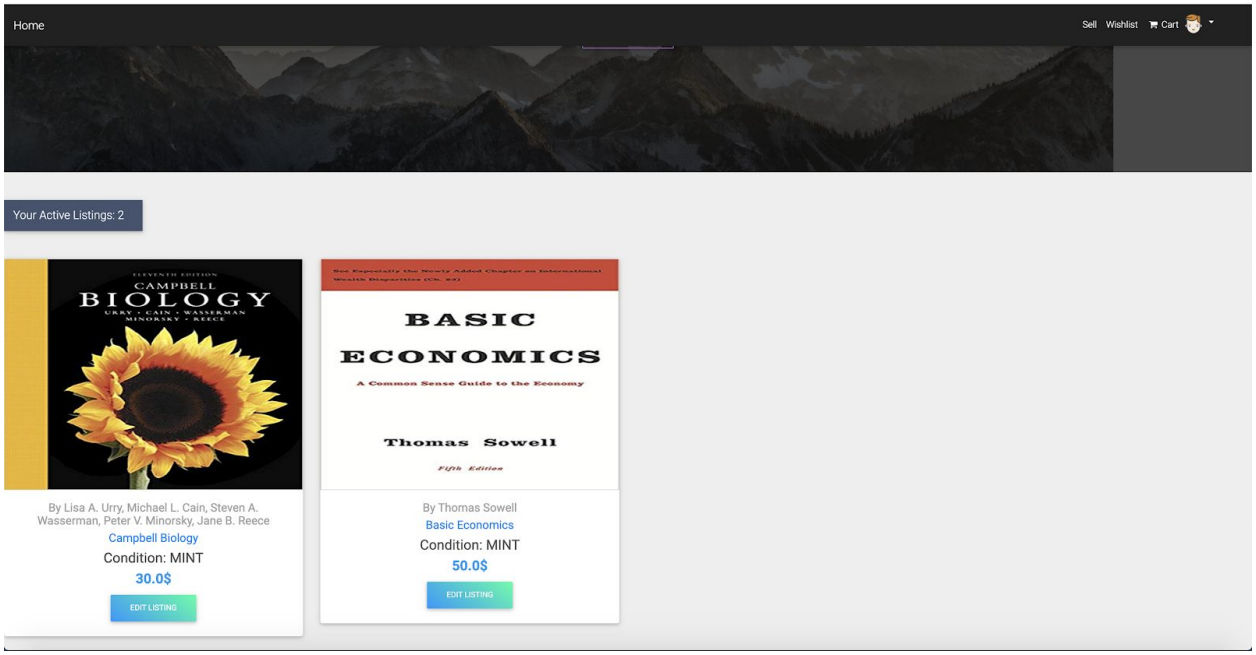
```
add_user_query =
"""
INSERT INTO Account (username, password, email, first_name, last_name, date_joined,
is_staff, is_superuser, is_active)
VALUES (%s, %s, %s, %s, %s, %s, %s, %s, %s);
"""
```

This is the query that adds a new row to the Account table with the user provided username, hashed password, email, first name, last name, date joined, is_staff, is_superuser, is_active. Is_staff, is_superuser, is_active are fields enforced on user models by Django, when creating a new account I put in values of 1 for True which means that the account is a superuser, is a staff, and is active. I put in values of 1 because for some reason if I put in 0 then it will store correctly as 0 in MySQL database but later on when I query with Django, it will shows those fields as NULL instead of 0 so for now I set them as values of 1 and set them to False later in the function.

```
get_user_query = "SELECT * FROM Account WHERE username = %s AND password = %s"
user = Account.objects.raw(get_user_query, get_user_arguments)[0]


auth_login(request, user);
```

Finally one last query is done to get the newly created row just inserted into Account table. With that row mapped to an Account object in Django, I can invoke auth_login to log the user in.

HOMEPAGE



This is the homepage which you see after logging into the application. If you are a new user, you have no active listings so this page will mostly be blank except for a navbar up top and a BROWSE button in the middle of the screen for browsing textbook listings in our database. You won't see any textbook if your database is brand new. In my case, I have 2 active listings for sell.

Query 1

Limit to 1000 rows

```
1  use store;
2      SELECT *
3      FROM Listing A, Textbook B
4      WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID AND A.Account_id = 1;
5
6
7
8
9
```

100% 13:2

Result Grid Filter Rows: Search Export:

id	Price	Account_id	Textbook_ID	Available	Textbook_ID	ISBN	Title	Image	Author	Publisher	Date_Published
24	30	1	25	1	25	9780134093413	Campbell Biology	Campbell-Biology.jpg	Lisa A. Urry, Michae…	Pearson	2016-10-29
25	50	1	26	1	26	9780465060733	Basic Economics	Basic-Economics_Q…	Thomas Sowell	Basic Books	2014-12-02

This is the query that shows the two active listings that belong to me.

BACKEND LOGIC

```
@login_required
def homepage(request):
    """
    Retrieve the logged in user's textbook listings

    """

    listing_query = """
    SELECT *
    FROM Listing A, Textbook B
    WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID AND A.Account_id = %s
    """
    listings = Listing.objects.raw(listing_query, [str(request.user.id)])

    return render(request, 'Homepage.html',context={'listings':listings})
```

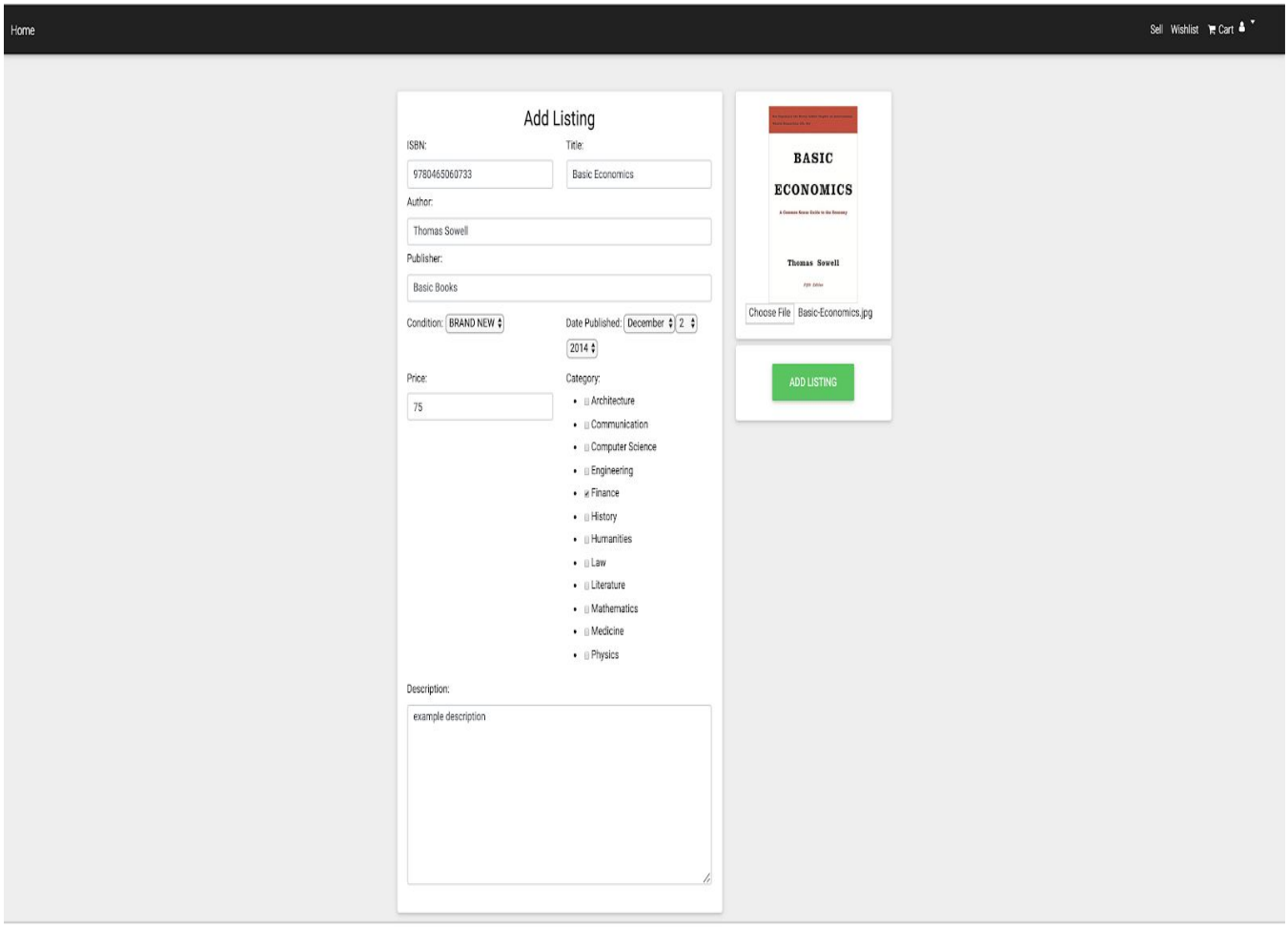
This is my select query statement for YOUR active listings to be displayed on the homepage. I join Listing and Textbook together where Listing.Available = 1 which mean that the listing is still available for sale, Listing.Textbook_ID = Textbook.Textbook_ID, and Listing.Account_id = request.user.id which means that this listing was listed by the logged in user (yourself).

Then this function returns a render of the Homepage.html file with the listings results passed in as context.

ADDING A TEXTBOOK LISTING

For this feature, I will add a new row to Textbook table, a new row to Listing table, and one or more rows to Category_Has_Textbook table.

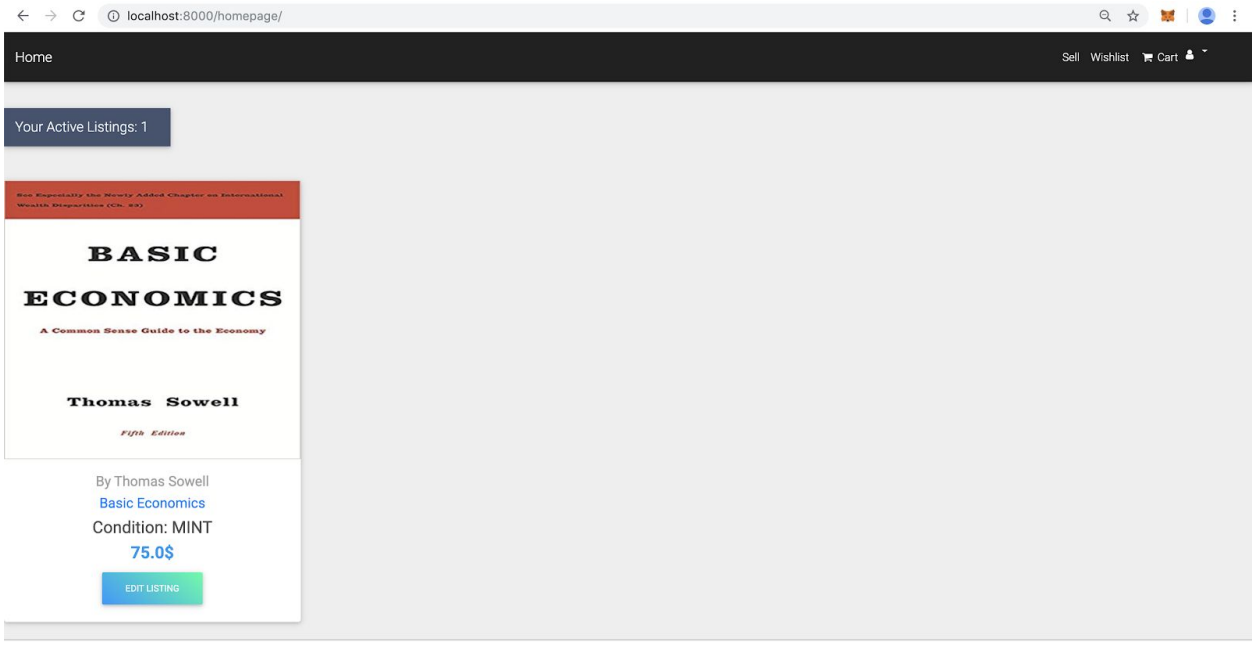
Click the SELL button on the navbar in the top right corner to begin adding a textbook listing to the database.



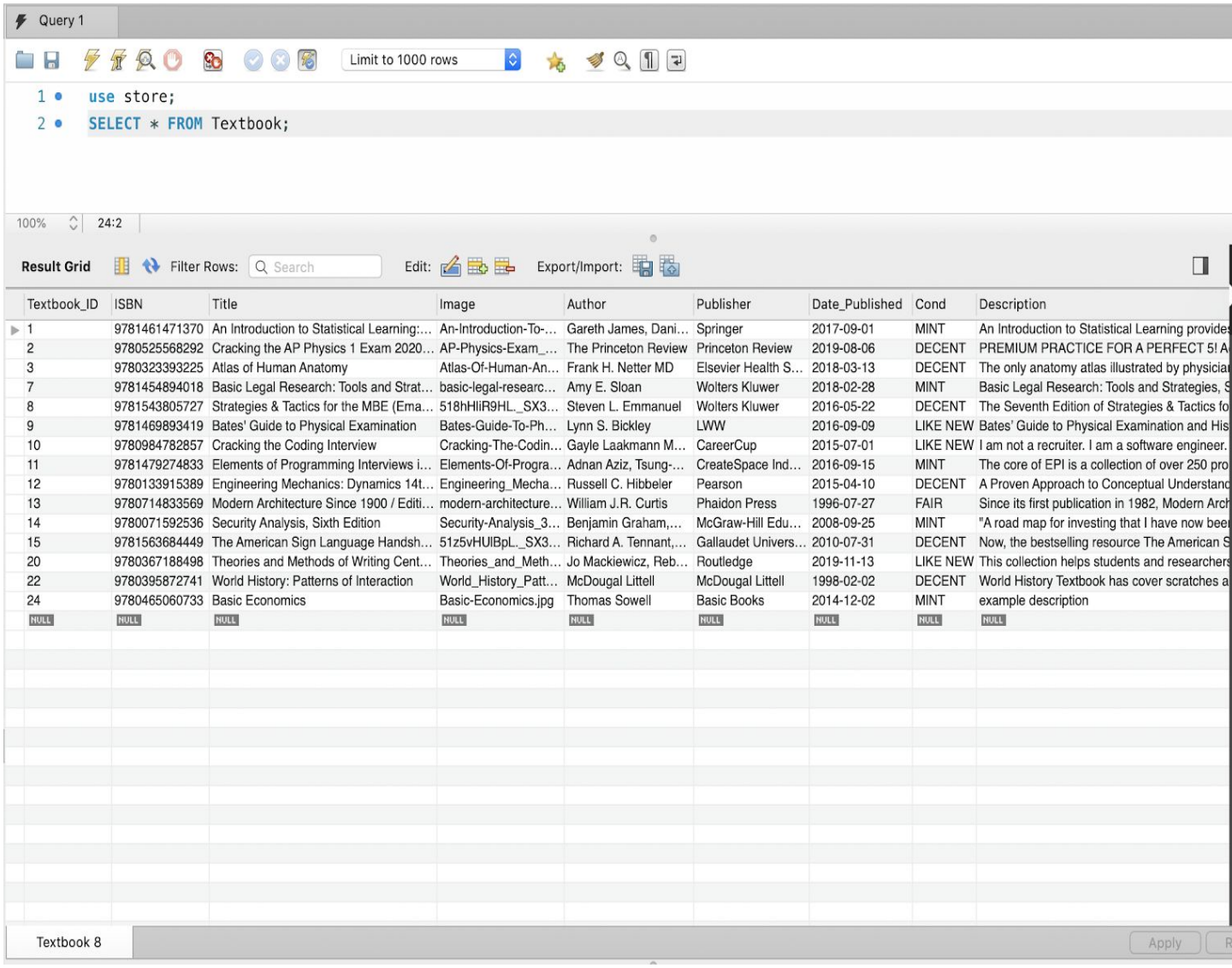
A form will display for you to input in the textbook's ISBN, Title, Author, Publisher, Condition, Date Published, Price, Category the textbook belongs to, Description, and an Image for the

textbook. The form is validated using javascript code in add-edit-listing.js file and basically the form will only be submitted if ISBN length is 13 and that all of the other fields must not be empty. You must also select at least 1 Category and uploads a picture for the form to submit. Nothing will be stored into our database until you hit Add Listing button, the image displayed is from using Javascript JQuery to display what you uploaded to the input field.

I will go ahead and add this textbook “Basic Economics” belonging to the category Finance.

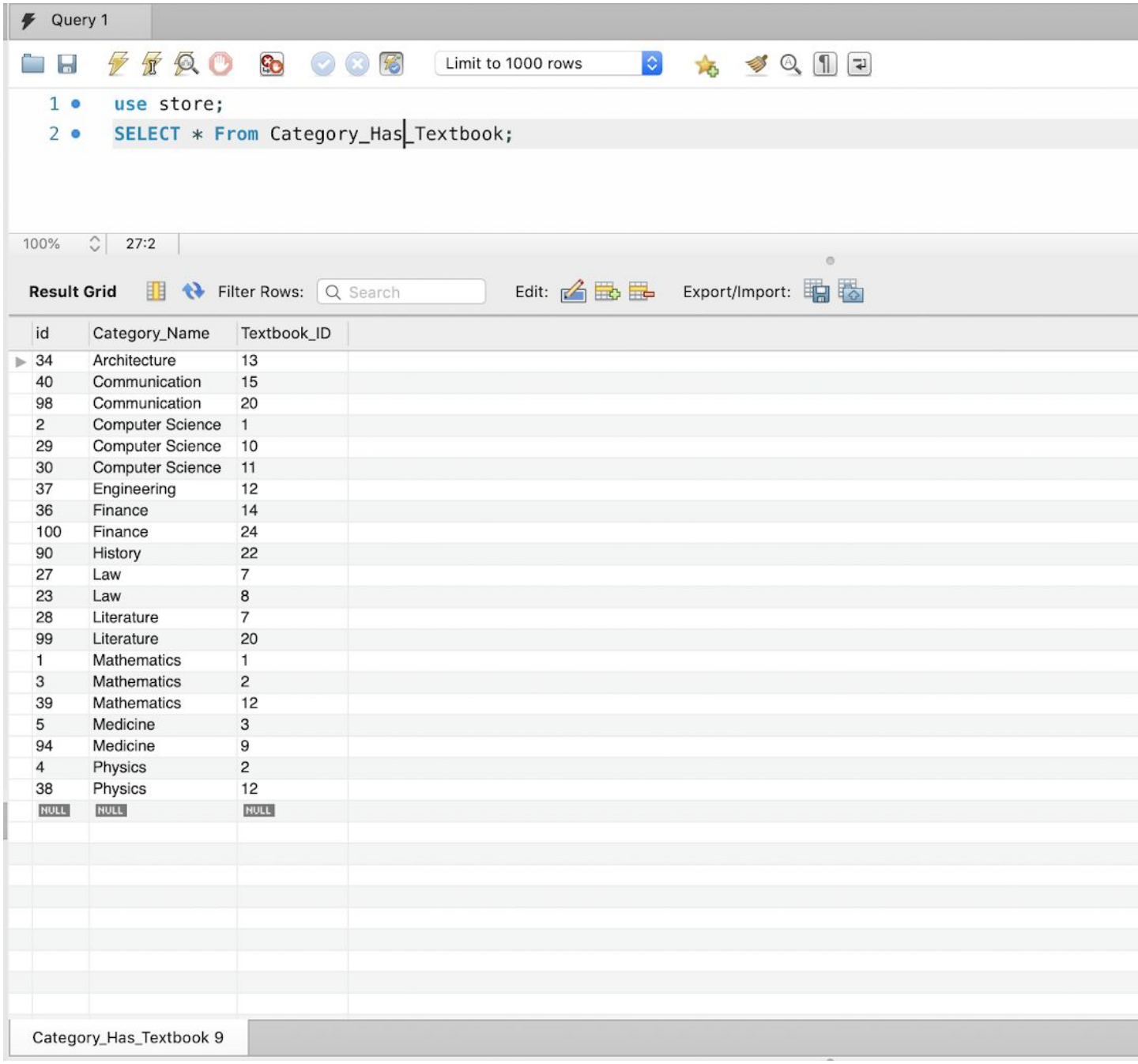


After you press Add Listing and all of your information is valid, you will be redirected to the homepage. Scroll down and you will see your new listing presented on the bottom.

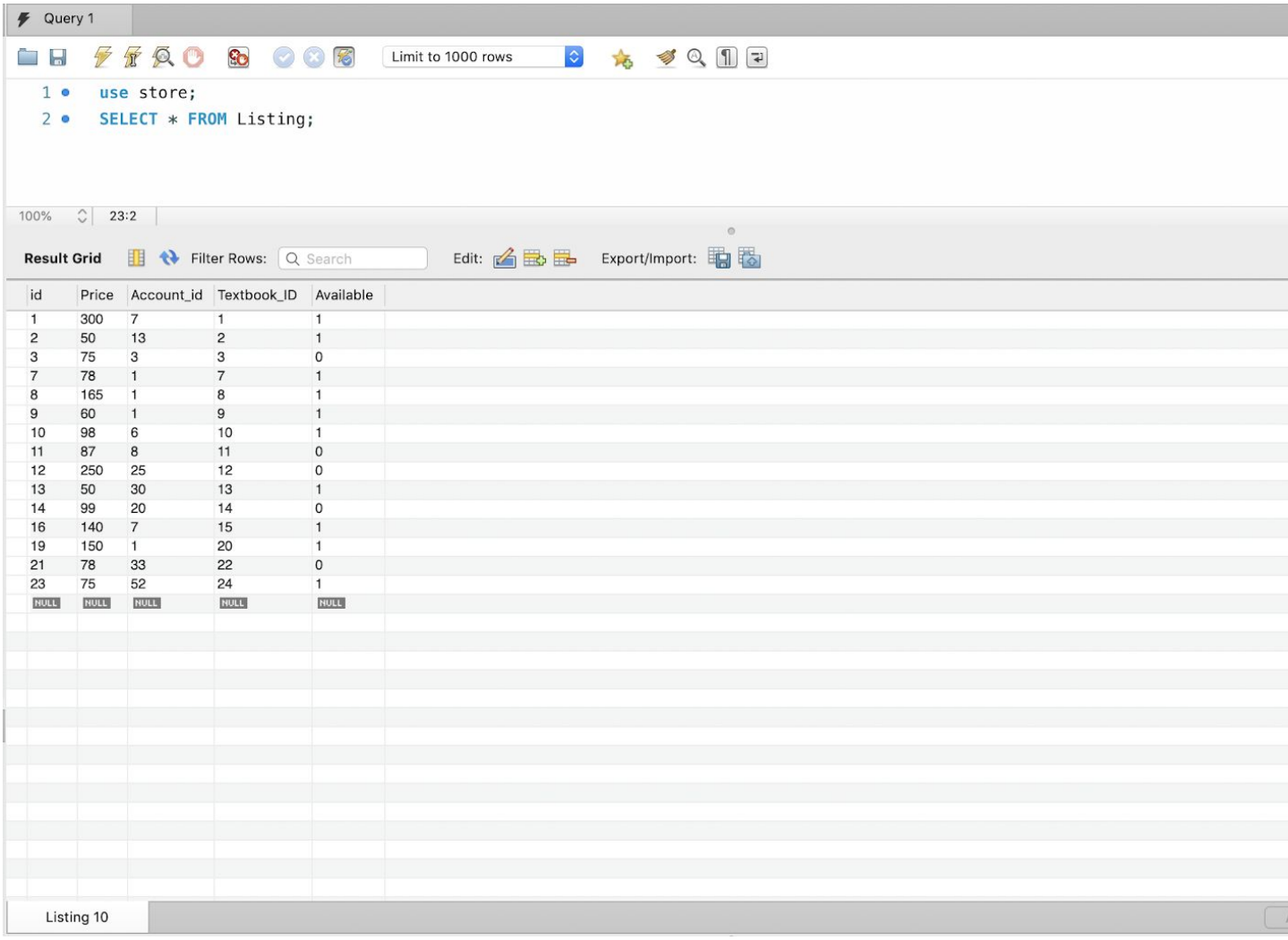


As you can see in the last row, the new textbook ISBN, Title, Image, Author, Publisher,

Date_Published, Cond, Description information has been inserted into the Textbook table.



As you can see, a new row is inserted into the table Category_Has_Textbook. The 9th row which has id = 100, Category_Name = Finance, and Textbook_ID = 24 represents that the new textbook we just listed belong to the Category Finance. If you selected multiple categories that your textbook belongs to, each category selected will be a row to be inserted into this table.



In the listing table, a new row is also inserted. In the very last row, a new row of Price = 75, Account_id = 52, Textbook_id = 24, and Available = 1 represents the new listing for the new textbook we just inserted. Price is the listed price of the textbook, Account_id is the foreign key of Account or the account that listed the textbook, Textbook_id is the foreign key of Textbook which is the new textbook inserted, and Available is the boolean field which indicates if this listing has been sold yet or not. If Available is 1, then the Listing is still available; if it has already sold, then Available field will be set to 0.

BACKEND LOGIC

views.py

```python
    return HttpResponseRedirect(reverse('homepage'))

@login_required
@require_POST
def add_listing_request(request):

    # Getting the textbook information from the POST request
    ISBN = request.POST.get('ISBN')
    Title = request.POST.get('Title')
    Author = request.POST.get('Author')
    Publisher = request.POST.get('Publisher')
    Cond = request.POST.get('Cond')
    Date_Published = request.POST.get('Date_Published_year') + "-" + request.POST.get('Date_Published_month') + "-" + request.POST.get('Date_Published_day');
    Price = request.POST.get('Price')
    Description = request.POST.get('Description')
    Image = request.FILES.get('Image')
    # This just create a Django form with the data sends in by the POST request
    form = forms.TextbookCreationForm(request.POST);
    Categories = request.POST.getlist('Category')
    # This checks if the data received by the POST request is valid
    if form.is_valid():
        Textbook_id = None;
        with connection.cursor() as cursor:
            insert_textbook_query = """
            INSERT INTO
            Textbook (ISBN, Title, Author, Publisher, Date_Published, Description, Cond)
            VALUES (%s, %s, %s, %s, %s, %s, %s)
            """
            # Insert a new textbook into the database using the query above
            cursor.execute(insert_textbook_query,(ISBN, Title, Author, Publisher, Date_Published, Description, Cond));
            # Get the last row ID of cursor which is the textbook_id of the new textbook we just inserted into the database
            Textbook_id = cursor.lastrowid
            # For each category that the textbook belongs to, insert a corresponding Category_Has_Textbook row
            for C in Categories:
                temp = Category.objects.raw("Select * From Category Where Category_Name = %s", [C])[0]
                cursor.execute("INSERT INTO Category_Has_Textbook (Category_Name, Textbook_ID) VALUES (%s, %s)", [temp.Category_Name, Textbook_id])
            cursor.execute("INSERT INTO Listing (Price, Account_id, Textbook_ID, Available) VALUES (%s, %s, %s, %s)", (Price, request.user.id, Textbook_id, '1'))
        connection.close()

        book = Textbook.objects.raw("Select * From Textbook WHERE Textbook_ID= %s", [Textbook_id])[0]
        book.Image = Image;
        book.save();
    else:
        print(form.errors);
    return HttpResponseRedirect(reverse('homepage'))
```

This is the Python code I used to handle the add listing functionality. First, I retrieve all the textbook information from the POST request and perhaps format them a bit. After that, I established a connection to the database and my SQL query to insert a new textbook into the database is

Insert_textbook_query =

```
"""
     INSERT INTO
     Textbook (ISBN, Title, Author, Publisher, Date_Published, Description, Cond)
     VALUES (%s, %s, %s, %s, %s, %s, %s)
"""
```

Note: Cond here stands for Condition (of the textbook)

I invoke cursor.execute(insert_textbook_query,(ISBN, Title, Author, Publisher, Date_Published, Description, Cond)); to run this query and insert in the new textbook.

The %s are just the pythonic way to prevents MySQL Injection Attacks. I passed in a list containing ISBN, Title, Author, Publisher, Date_Published, Description, Cond into the execute statement and it means that the first %s will be replaced with the value of ISBN, the 2nd %s will be replaced with the value of Title and so on.

After that, this part here handle inserting into the Category_Has_Textbook relationship that represents what Category a textbook belongs to. This for loop represents that for every category selected by the user, I will insert a new row into Category_Has_Textbook of the corresponding Category_Name and the Textbook_ID of the new textbook inserted.

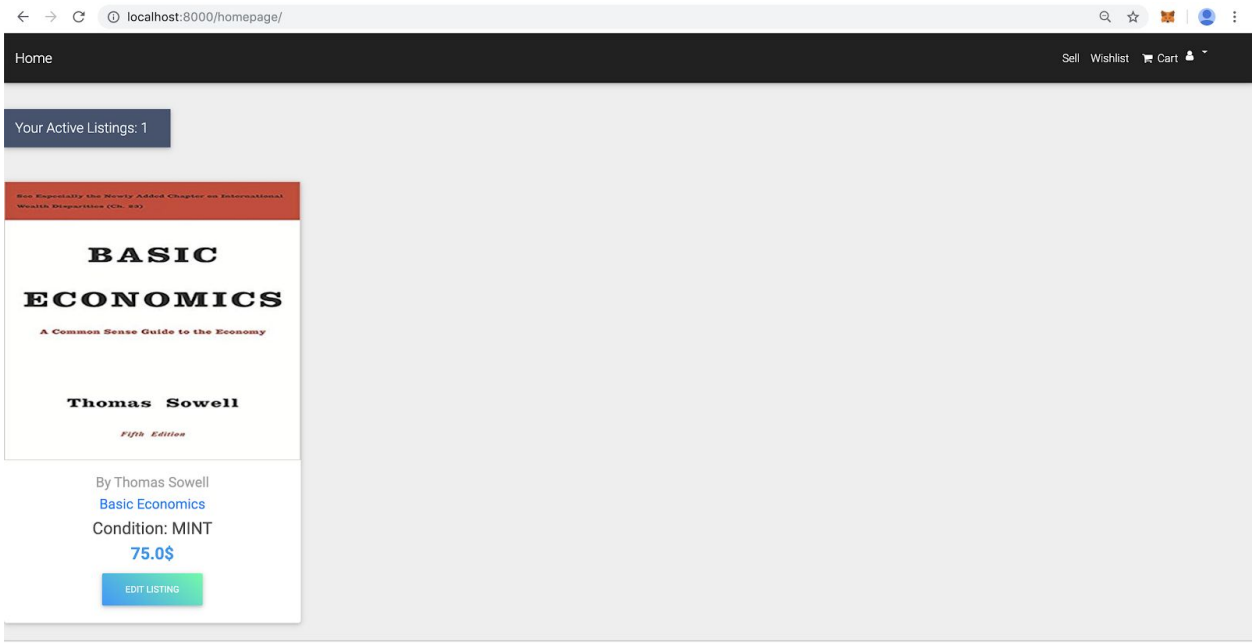
```
for C in Categories:
      temp = Category.objects.raw("Select * From Category Where Category_Name = %s",
      [C])[0]
      cursor.execute("INSERT INTO Category_Has_Textbook (Category_Name, Textbook_ID)
      VALUES (%s, %s)", [temp.Category_Name, Textbook_id])
```

```
cursor.execute("INSERT INTO Listing (Price, Account_id, Textbook_ID, Available) VALUES
(%s, %s, %s, %s)", (Price, request.user.id, Textbook_id, '1'))
```

Finally, this part inserts a new row into the Listing table that represents a new textbook listing. I inserts the Price, foreign key Account_id, foreign_key Textbook_ID, and Available as 1 to marks that it is available for sale.

EDIT LISTING

For this section, I will use UPDATE to update rows in the Listing table, Textbook table, or Category_Has_Textbook table



In the homepage, scrolling down you can see the list of your active listings and a button to Edit your Listing information. Clicking it will invoke this function:

```python
@login_required
def view_product_page(request, textbook_id):
    query = """
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE A.Available = 1 AND A.Account_id = C.id AND A.Textbook_ID = B.Textbook_ID AND A.Textbook_ID = %s
    """
    listing = Listing.objects.raw(query, [textbook_id])[0];

    Cart = Shopping_Cart.objects.raw("SELECT * FROM Shopping_Cart WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])
    Wish_list = Wishlist.objects.raw("SELECT * FROM Wishlist WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])
    Cart = Cart[:]
    Wish_list = Wish_list[:]
    Listing_In_Cart = False
    Listing_In_Wishlist = False
    if len(Cart) == 1:
        Listing_In_Cart = True
    if len(Wish_list) == 1:
        Listing_In_Wishlist = True
    # If the listing is listed by the user, then return a view that lets the user edit the listing information instead
    if listing.username == request.user.username:
        Category_Query = """
        SELECT id, A.Category_Name
        FROM Category_Has_Textbook A, Category B
        WHERE B.Category_Name = A.Category_Name AND A.Textbook_ID = %s
        """
        Categories = Category.objects.raw(Category_Query, [textbook_id])

        # This part retrieves the information from the listing query at the beginning and formats it into a dictionary
        # the dictionary is then used to initialize a TextbookChangeForm to create an edit listing information form
        # prefilled with the textbook listing information
        data = {'ISBN': listing.ISBN,'Title': listing.Title,'Author': listing.Author,'Publisher': listing.Publisher,'Cond': listing.Cond,
                'Date_Published': listing.Date_Published, 'Price': listing.Price, 'Description': listing.Description,'Image': listing.Image
                ,'Category': Categories}
        form = forms.TextbookChangeForm(initial=data)
        return render(request, 'My_Product_Page.html', context={'form': form, 'listing': listing})

    return render(request, 'Product_Page.html', context={'listing': listing, 'Cart': Listing_In_Cart, 'Wishlist': Listing_In_Wishlist})
```

This function handle returning the view when you click the edit/view button associated with each textbook listing. If the listing is not listed by you, it will return a render of Product_Page.html otherwise if listing.username == request.user.username (you listed the textbook listing) then it will return a render of My_Product_Page.html which will let brings up a form for me to edit my listing.

First, this function has a passed in argument textbook_id which is the textbook_id associated with the listing you clicked on to edit.

```
query =
"""
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE A.Available = 1 AND A.Account_id = C.id AND A.Textbook_ID = B.Textbook_ID
    AND A.Textbook_ID = %s
```

"""

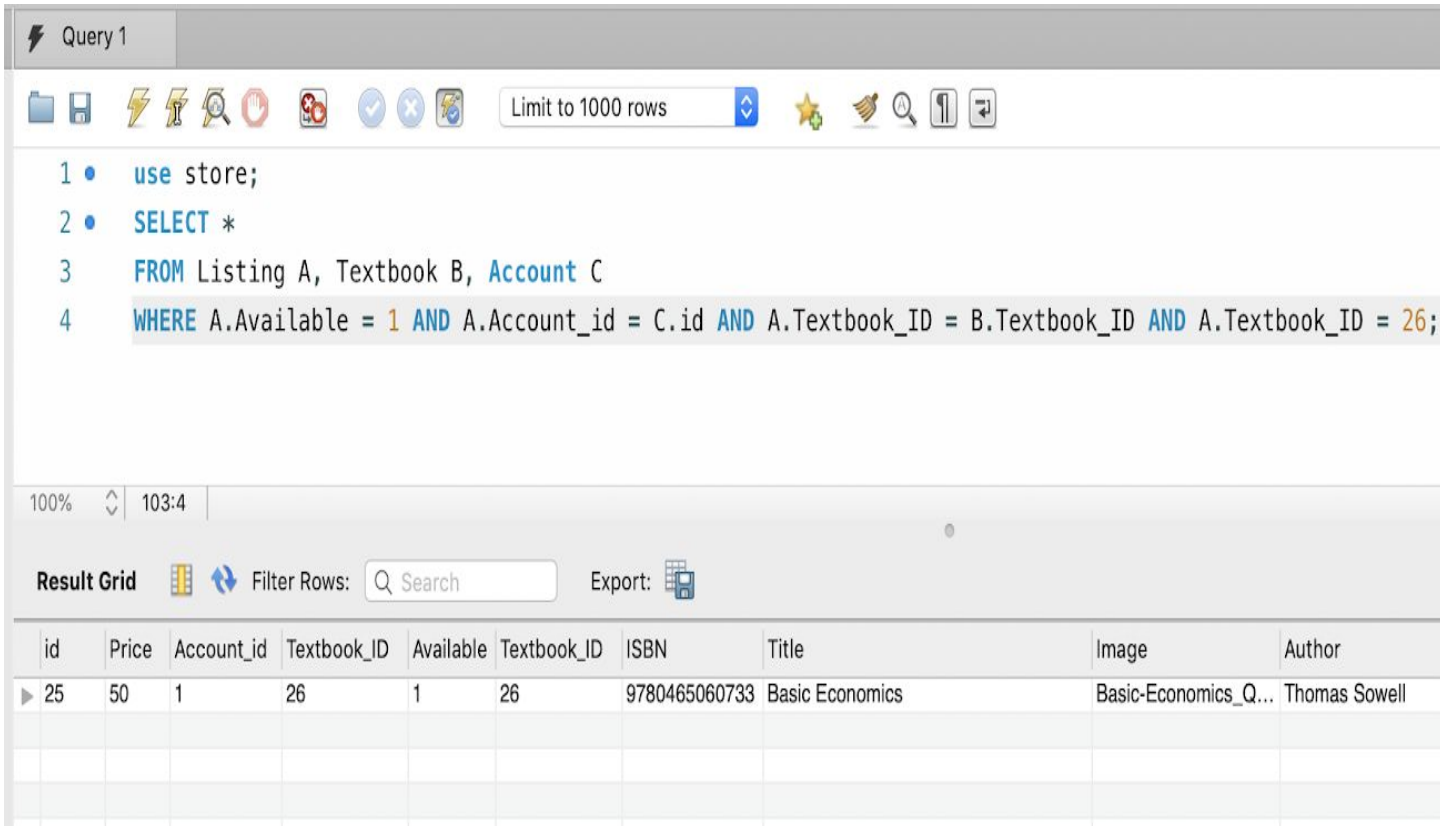
I join table Listing, Textbook, Account where Listing.Available = 1 (listing for sale), Listing.Account_id = Account.Account_id (this is the seller's account id), Listing.Textbook_ID = Textbook.Textbook_ID AND Listing.Textbook_ID = textbook_id. This returns me the listing information, textbook information, and seller account id of the textbook I clicked on for edit.

Then I do another query,

```
Category_Query =
"""
        SELECT id, A.Category_Name
        FROM Category_Has_Textbook A, Category B
        WHERE B.Category_Name = A.Category_Name AND A.Textbook_ID = %s
 """
```

This query joins the Category_Has_Textbook and Category table based on their Category_Name and has a specific textbook id. This finds all the category that the listed textbook belongs to.

The result of these 2 query is passed into the render of My_Product_Page.html that returns the view.



This is the query I used to retrieve information about the textbook and use it to prefill my input fields for

Edit Listing form

Ch goin57

Query 1

Limit to 1000 rows

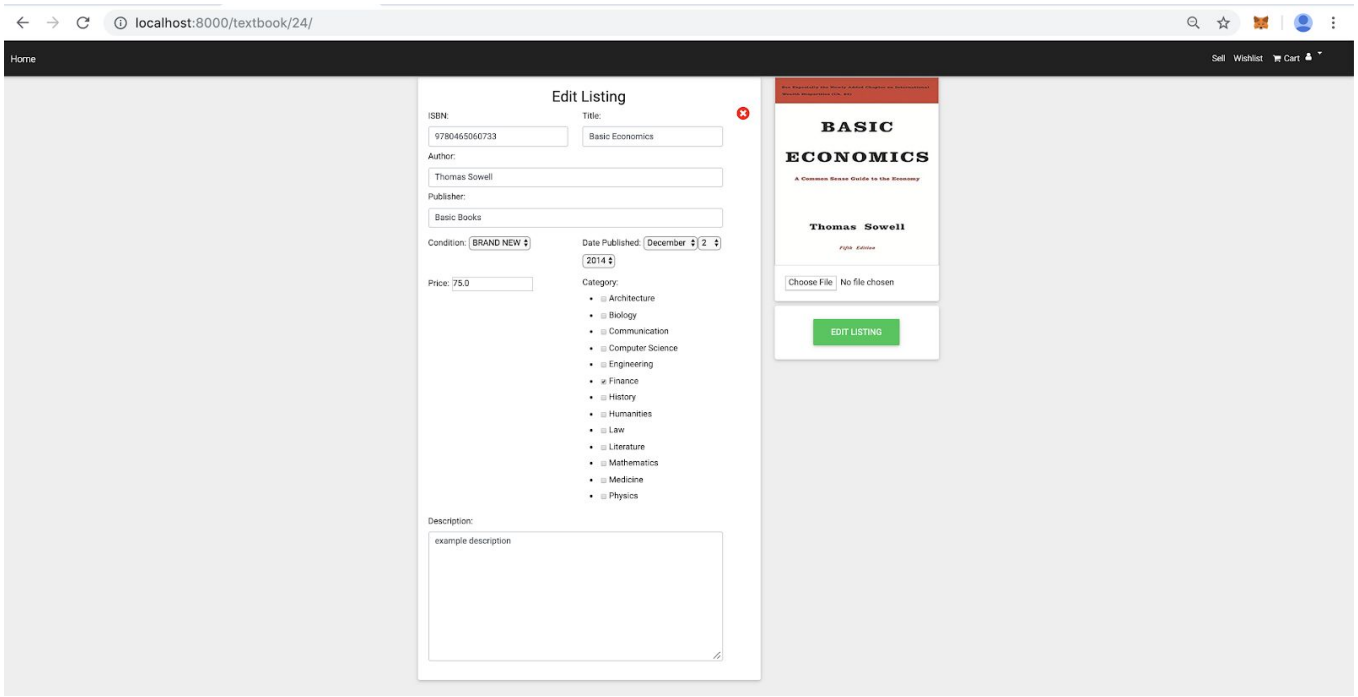
```
1  use store;
2  SELECT id, A.Category_Name
3  FROM Category_Has_Textbook A, Category B
4  WHERE B.Category_Name = A.Category_Name AND A.Textbook_ID = 26;
```

100% 64:4

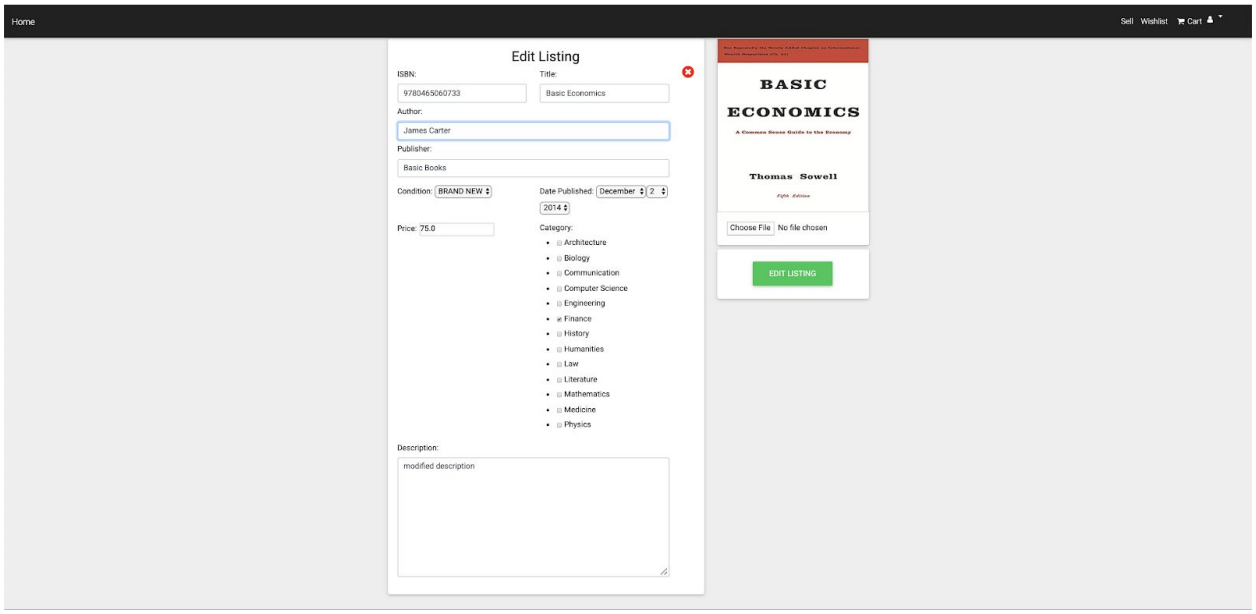
Result Grid Filter Rows: Search Export:

id	Category_Name
115	Finance

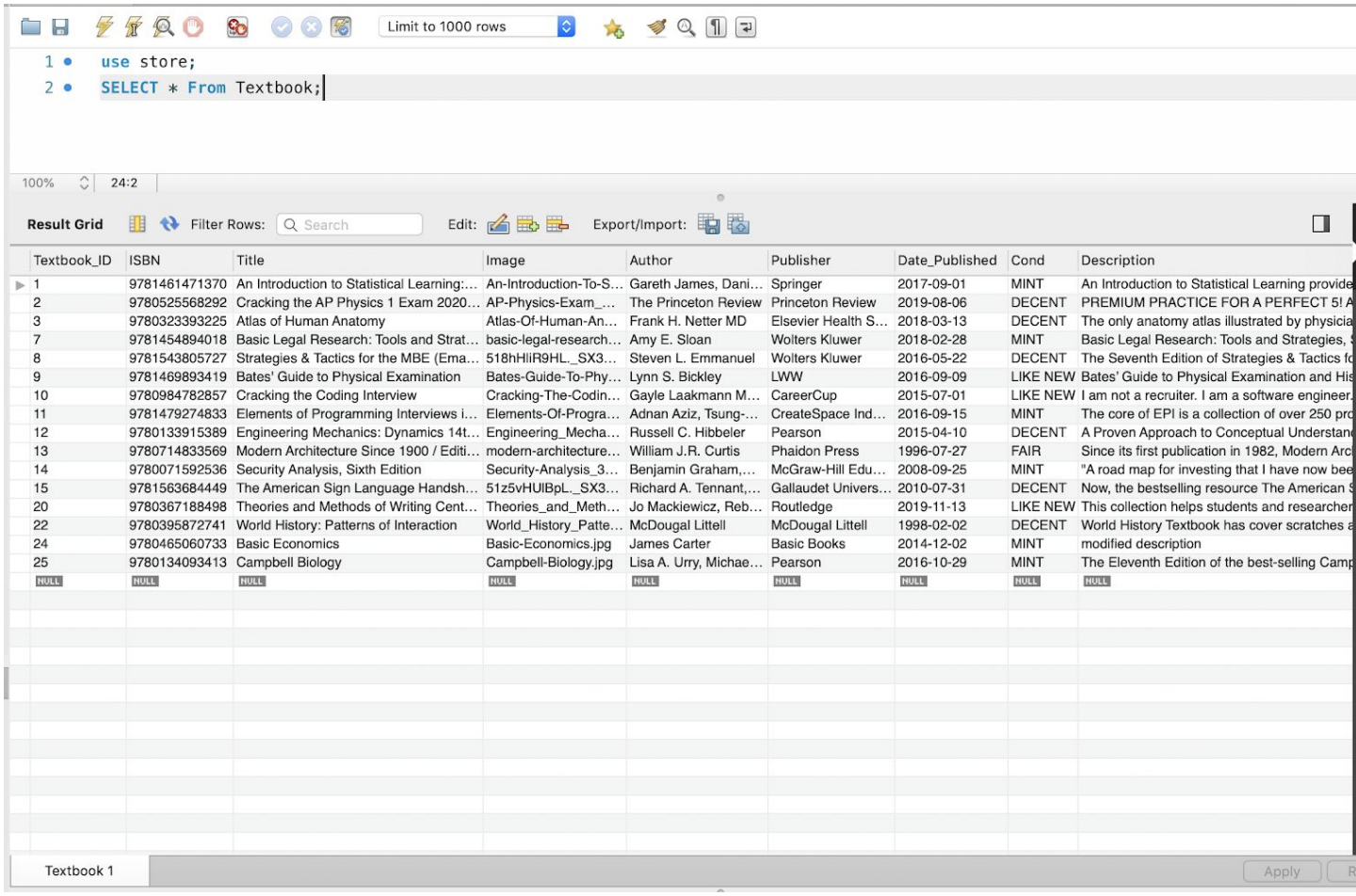
This is the query I used to determine which Category the textbook belonged to and used it to prefill my "Category" select option for Edit Listing form.



As you can see, it returns a form similar to the add listing form but this form is already filled with the information about the textbook listing along with the categories it belong to. You can change any of the information and clicks Edit Listing button to commit the changes to our database.



I will change the Author from Thomas Sowell to James Carter, the description from ‘example description’ to ‘Modified Listing’ and then clicks Edit Listing to commit the changes to my database.



```
use store;
SELECT * From Textbook;
```

Result Grid

Textbook_ID	ISBN	Title	Image	Author	Publisher	Date_Published	Cond	Description
1	9781461471370	An Introduction to Statistical Learning:...	An-Introduction-To-S...	Gareth James, Dani...	Springer	2017-09-01	MINT	An Introduction to Statistical Learning provide
2	9780525568292	Cracking the AP Physics 1 Exam 2020...	AP-Physics-Exam_...	The Princeton Review	Princeton Review	2019-08-06	DECENT	PREMIUM PRACTICE FOR A PERFECT 5! A
3	9780323393225	Atlas of Human Anatomy	Atlas-Of-Human-An...	Frank H. Netter MD	Elsevier Health S...	2018-03-13	DECENT	The only anatomy atlas illustrated by physicia
7	9781454894018	Basic Legal Research: Tools and Strat...	basic-legal-research...	Amy E. Sloan	Wolters Kluwer	2018-02-28	MINT	Basic Legal Research: Tools and Strategies,
8	9781543805727	Strategies & Tactics for the MBE (Ema...	518hHliR9HL._SX3...	Steven L. Emmanuel	Wolters Kluwer	2016-05-22	DECENT	The Seventh Edition of Strategies & Tactics fo
9	9781469893419	Bates' Guide to Physical Examination	Bates-Guide-To-Phy...	Lynn S. Bickley	LWW	2016-09-09	LIKE NEW	Bates' Guide to Physical Examination and His
10	9780984782857	Cracking the Coding Interview	Cracking-The-Codin...	Gayle Laakmann M...	CareerCup	2015-07-01	LIKE NEW	I am not a recruiter. I am a software engineer.
11	9781479274833	Elements of Programming Interviews i...	Elements-Of-Progra...	Adnan Aziz, Tsung-...	CreateSpace Ind...	2016-09-15	MINT	The core of EPI is a collection of over 250 pro
12	9780133915389	Engineering Mechanics: Dynamics 14t...	Engineering_Mecha...	Russell C. Hibbeler	Pearson	2015-04-10	DECENT	A Proven Approach to Conceptual Understan
13	9780714833569	Modern Architecture Since 1900 / Editi...	modern-architecture...	William J.R. Curtis	Phaidon Press	1996-07-27	FAIR	Since its first publication in 1982, Modern Arc
14	9780071592536	Security Analysis, Sixth Edition	Security-Analysis_3...	Benjamin Graham,...	McGraw-Hill Edu...	2008-09-25	MINT	"A road map for investing that I have now bee
15	9781563684449	The American Sign Language Handsh...	51z5vHUlBpL._SX3...	Richard A. Tennant,...	Gallaudet Univers...	2010-07-31	DECENT	Now, the bestselling resource The American S
20	9780367188498	Theories and Methods of Writing Cent...	Theories_and_Meth...	Jo Mackiewicz, Reb...	Routledge	2019-11-13	LIKE NEW	This collection helps students and researcher
22	9780395872741	World History: Patterns of Interaction	World_History_Patte...	McDougal Littell	McDougal Littell	1998-02-02	DECENT	World History Textbook has cover scratches a
24	9780465060733	Basic Economics	Basic-Economics.jpg	James Carter	Basic Books	2014-12-02	MINT	modified description
25	9780134093413	Campbell Biology	Campbell-Biology.jpg	Lisa A. Urry, Michae...	Pearson	2016-10-29	MINT	The Eleventh Edition of the best-selling Camp
NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL	NULL

Textbook 1

As you can see in the 2nd to last row, the author has been changed to James Carter and Description has been changed to modified.

```python
@login_required
@require_POST
def edit_listing_request(request):

    form = forms.TextbookChangeForm(request.POST)
    if form.is_valid():

        # Get the Date Published and list of category that the textbook belong to information
        Date_Published = request.POST.get('Date_Published_year') + "-" + request.POST.get('Date_Published_month') + "-" + request.POST.get('Date_Published_day');
        Category_List = request.POST.getlist('Category')

        with connection.cursor() as cursor:

            # Select every row in Category_Has_Textbook table that this textbook listing belongs to
            Categories = Category_Has_Textbook.objects.raw("SELECT * FROM Category_Has_Textbook WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])
            # If the textbook no longer belong to that Category, DELETE the corresponding Category_Has_Textbook row
            for C in Categories:
                if C.Category not in Category_List:
                    cursor.execute("DELETE FROM Category_Has_Textbook WHERE Category_Name = %s AND Textbook_ID = %s", [C.Category.Category_Name, request.POST.get('textbook_id')])

            # Requery to find the list of categories that the textbook still belongs to after deleting the unselected categories
            Categories = Category_Has_Textbook.objects.raw("SELECT * FROM Category_Has_Textbook WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])

            # Slices it to unwrap the RawQueryset into a list
            temp = Categories[:]
            Categories = []

            # Append the name of each category that the textbook belongs to into a list
            # This makes a LIST of all the name of the category this textbook belong to!
            for t in temp:
                Categories.append(t.Category)

            # If a category that the textbook belongs is in both Categories and Category_List
            # then there already exists a Category_Has_Textbook row for that Category and this Textbook so do nothing
            # Else insert a new Category_Has_Textbook row
            for C in Category_List:
                if C in Categories:
                    pass
                else:
                    cursor.execute("INSERT INTO Category_Has_Textbook (Category_Name, Textbook_ID) VALUES (%s, %s)", [C, request.POST.get('textbook_id')])

            Book = Textbook.objects.raw("SELECT * FROM Textbook WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])[0]
            # If the textbook image is also edited, then make an update query including the Image column
            # If not then make an update query without including the Image column
            if request.FILES.get('Image') != None:
                update_textbook_query = """
                UPDATE Textbook
                SET ISBN = %s, Title = %s, Author = %s, Publisher = %s,
```

```python
            Book = Textbook.objects.raw("SELECT * FROM Textbook WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])[0]
            # If the textbook image is also edited, then make an update query including the Image column
            # If not then make an update query without including the Image column
            if request.FILES.get('Image') != None:
                update_textbook_query = """
                UPDATE Textbook
                SET ISBN = %s, Title = %s, Author = %s, Publisher = %s,
                Cond = %s, Description = %s, Date_Published = %s, Image = %s
                WHERE Textbook_ID = %s;
                """
                update_textbook_arguments = [request.POST.get('ISBN'), request.POST.get('Title'), request.POST.get('Author'),\
                    request.POST.get('Publisher'), request.POST.get('Cond'), request.POST.get('Description'), Date_Published,\
                    request.FILES.get('Image').name, request.POST.get('textbook_id')]

                cursor.execute(update_textbook_query, update_textbook_arguments)
                Book.Image = request.FILES.get('Image')
                Book.save()
            else:
                update_textbook_query = """
                UPDATE Textbook
                SET ISBN = %s, Title = %s, Author = %s, Publisher = %s,
                Cond = %s, Description = %s, Date_Published = %s
                WHERE Textbook_ID = %s;
                """
                update_textbook_arguments = [request.POST.get('ISBN'), request.POST.get('Title'), request.POST.get('Author'),\
                    request.POST.get('Publisher'), request.POST.get('Cond'), request.POST.get('Description'), Date_Published,request.POST.get('textbook_id')]
                cursor.execute(update_textbook_query, update_textbook_arguments)

            # Update the price of the listing
            update_listing_query = "UPDATE Listing SET Price = %s WHERE Textbook_ID = %s;"
            update_listing_arguments = [request.POST.get('Price'), request.POST.get('textbook_id')]
            cursor.execute(update_listing_query, update_listing_arguments)

        connection.close()
    # Redirects to homepage
    return HttpResponseRedirect(reverse('homepage'))
```

This edit_listing_request function handles the updating information about the textbook listing.

First, it selects every row in Category_Has_Textbook with a specific textbook_id

---

```
Categories = Category_Has_Textbook.objects.raw("SELECT * FROM Category_Has_Textbook
WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])
```

Then from the list of category edited by the user, it will runs

---

```
for C in Categories:
     if C.Category not in Category_List:
       cursor.execute("DELETE FROM Category_Has_Textbook WHERE Category_Name = %s AND
       Textbook_ID = %s", [C.Category.Category_Name, request.POST.get('textbook_id')])
```

This part checks if the textbook STILL belongs to those Categories. If not, then it will DELETE that row from Category_Has_Textbook

---

```
Categories = Category_Has_Textbook.objects.raw("SELECT * FROM Category_Has_Textbook
WHERE Textbook_ID = %s", [request.POST.get('textbook_id')])

for C in Category_List:
     if C in Categories:
            pass
     Else:
       cursor.execute("INSERT INTO Category_Has_Textbook (Category_Name, Textbook_ID)
       VALUES (%s, %s)", [C, request.POST.get('textbook_id')])
```

This part requery the Categories that the textbook still belongs to after you deleted the categories no longer selected by the user. Then it checks if the categories selected already has a row in the Category_has_Textbook table, if yes, then it does nothing, else it will INSERT a new row into Category_Has_Textbook table representing a new category that the textbook now belongs to.

Then I simply update the Textbook table with this query:

```
update_textbook_query =
          """
                UPDATE Textbook
                SET ISBN = %s, Title = %s, Author = %s, Publisher = %s,
                Cond = %s, Description = %s, Date_Published = %s, Image = %s
                WHERE Textbook_ID = textbook_id;
                """
```

This update the Textbook row with Textbook_ID = textbook_id. If the Image is not changed, then I used another query that is the same except it excludes the Image = %s.

If column Title is changed, then this query will change this in the database. If column ISBN was not changed, this query will recognize that the value is the same and won't update the ISBN column.

Finally, one last query is used to update the Listing table

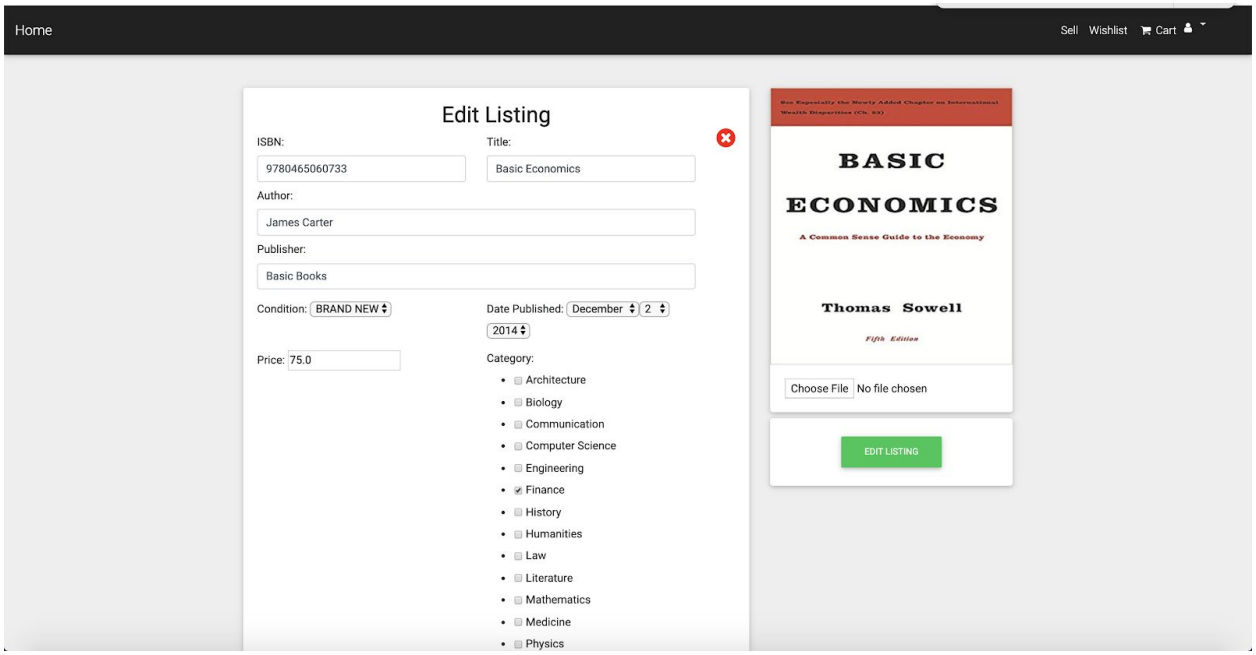
```
Update_listing_query =
"""
UPDATE Listing
SET Price = %s
WHERE Textbook_ID = %s;
"""
```

This simply updates the Price column in a row in Listing filtering by Textbook_ID

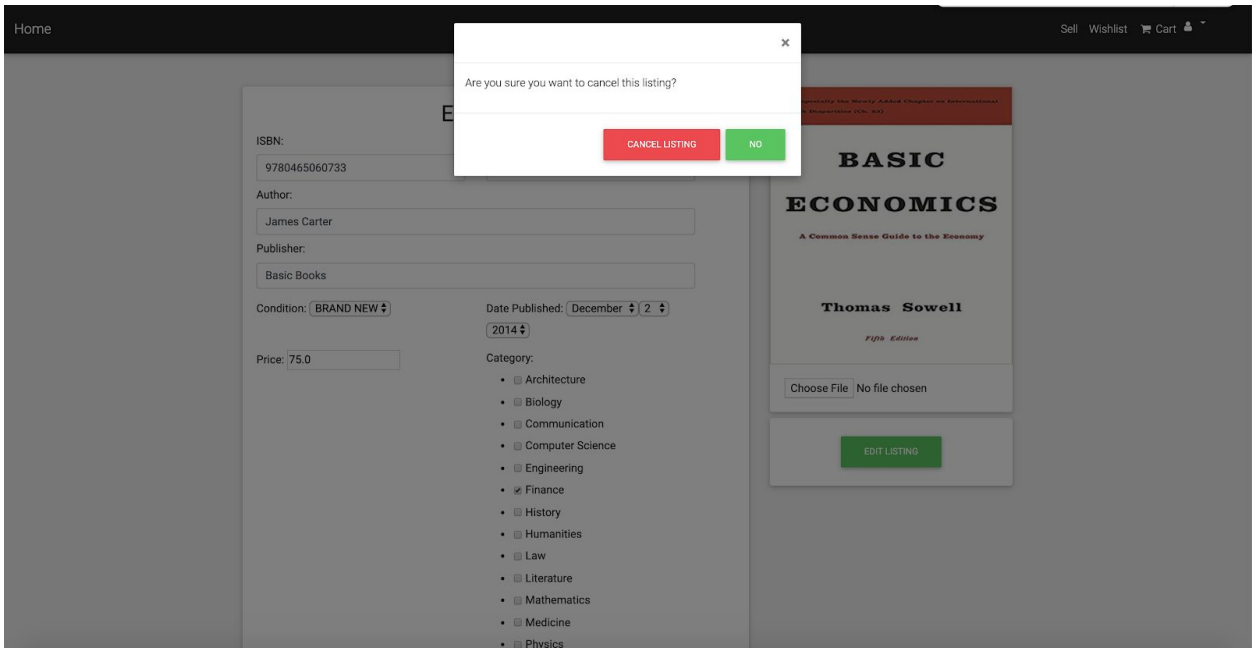
Then the function return a HttpResponseRedirect(reverse('homepage')) which redirects you to the homepage.

Cancel Listing Functionality

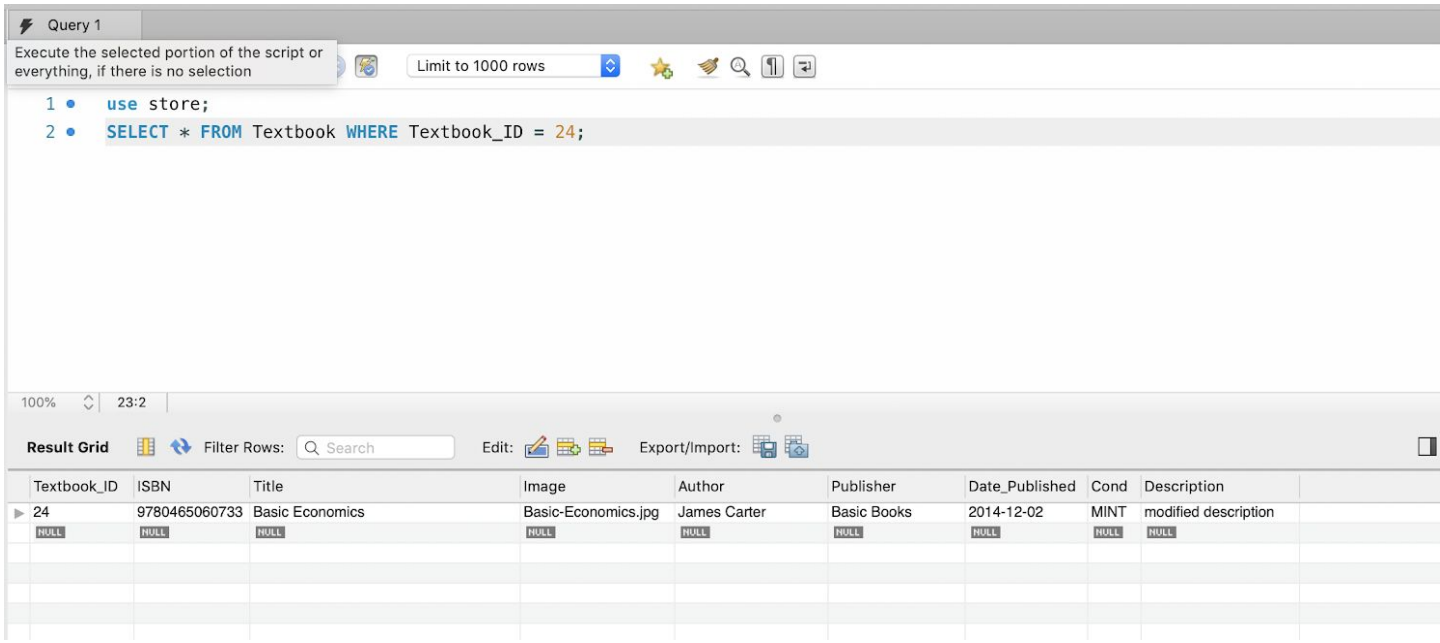
For this feature, I will delete a row from Textbook table, a row from Listing table, one or more rows from Category_Has_Textbook table, one or more rows from Wishlist table, and one or more rows from Shopping Cart table.



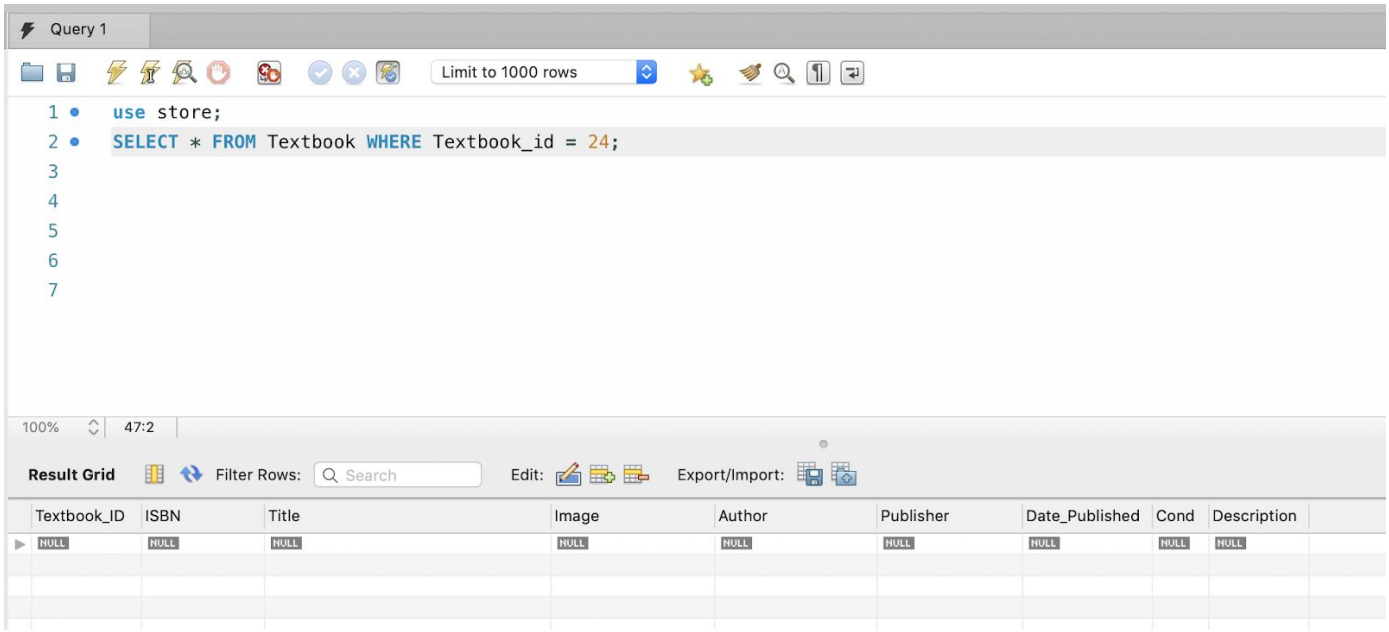
To cancel a listing, click on Edit Listing on one of your active listings and then click on the red X on the upper right corner of the Edit Listing form.



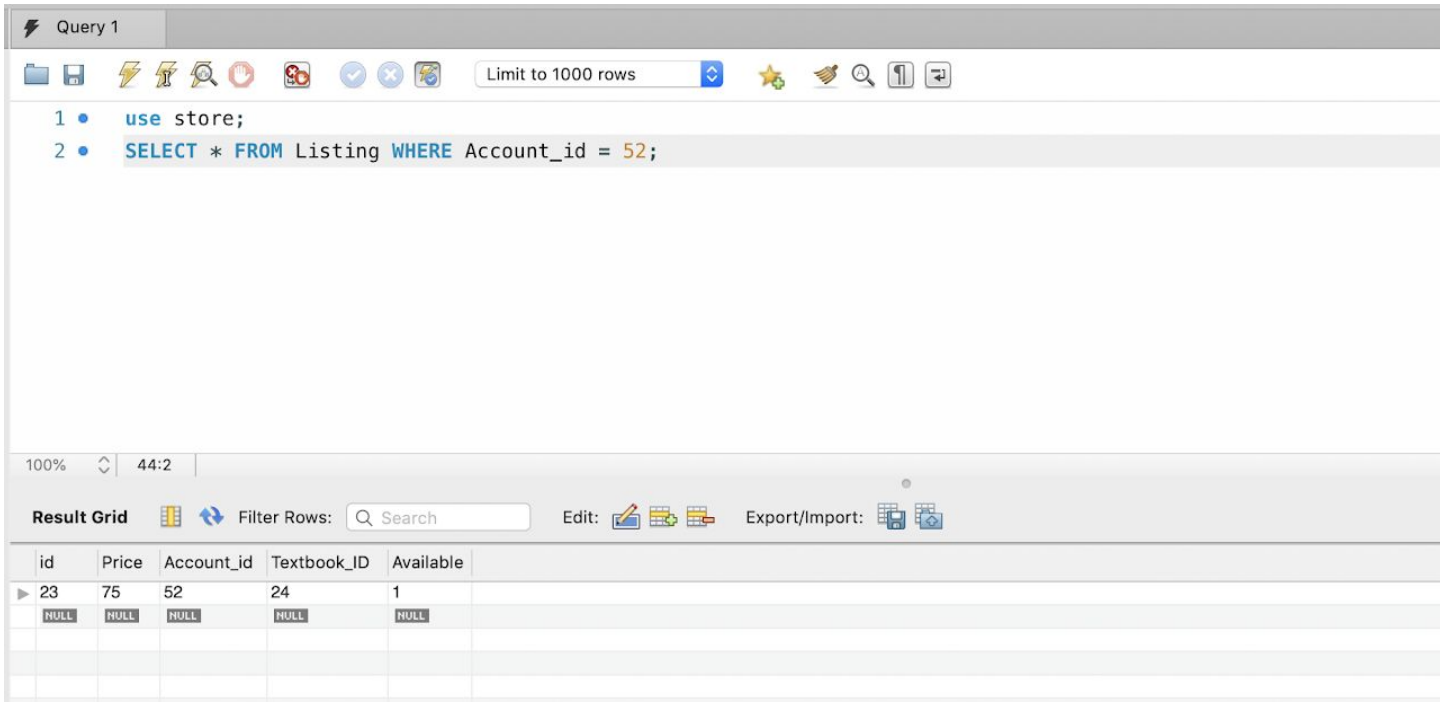
A popup modal window will appear asking if you are sure you want to cancel the listing, click Cancel Listing to go ahead and cancel the listing



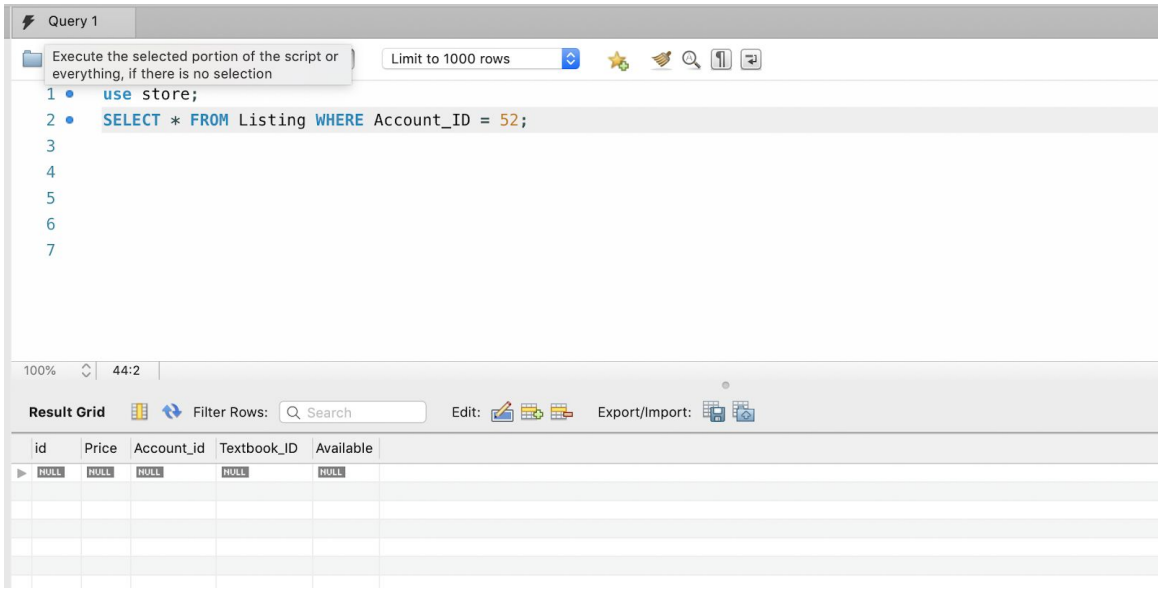
This is the row in Textbook table with Textbook_ID = 24, the textbook that the account I am currently logged into have listed for sale



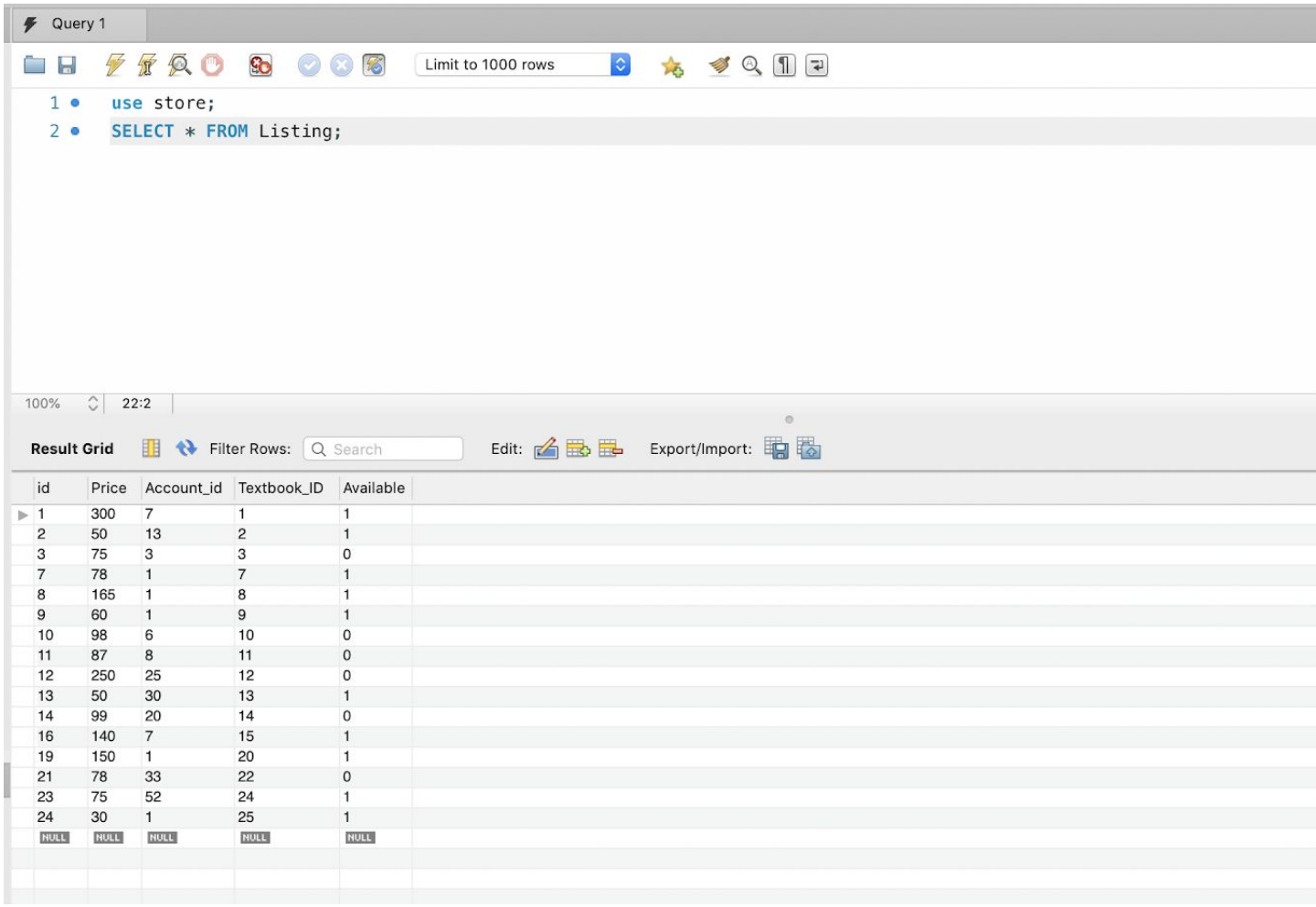
After canceling the listing, the query returns NULL as the textbook has been deleted from the database.



This is the row in Listing table with account_id = 52 (the account I am logged in to) and this shows that the account has an active listing for textbook_id 24

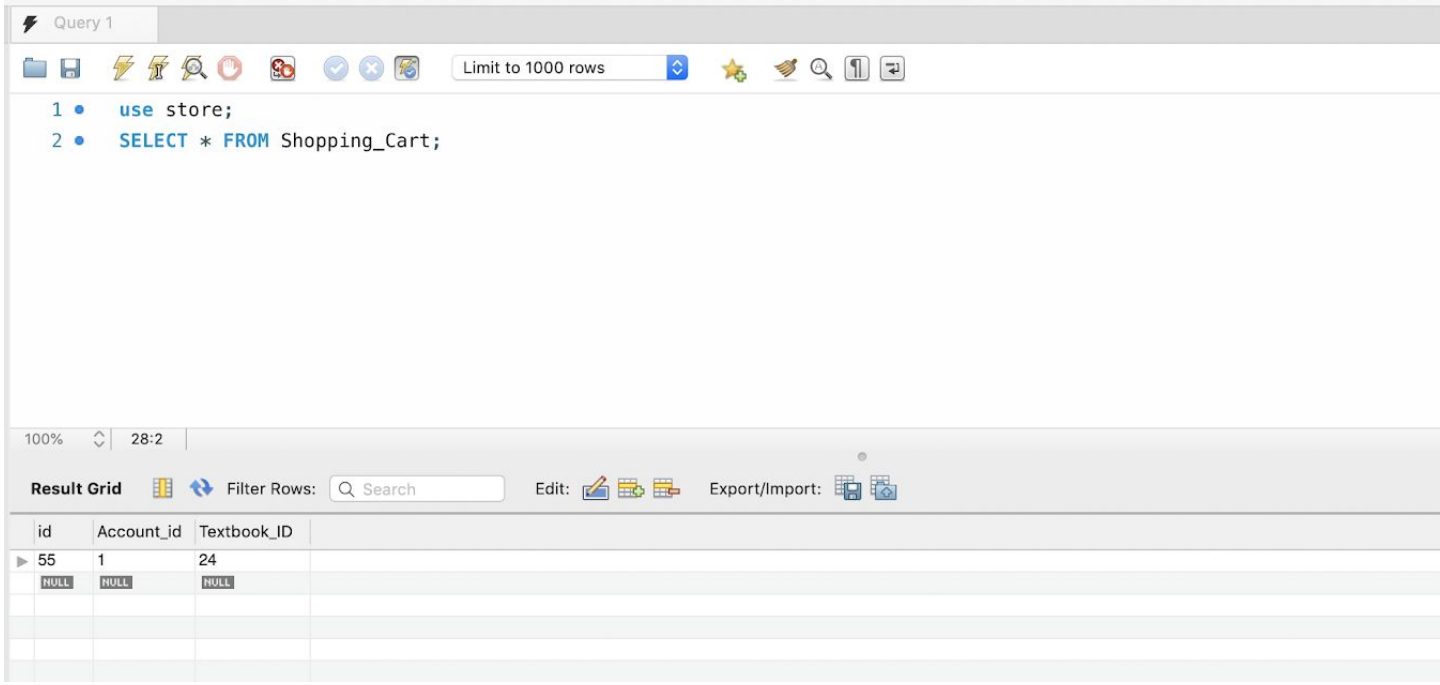


After canceling the listing, the query result return NULL as the listing has been deleted from the database and now the account I'm logged into has no active listings.

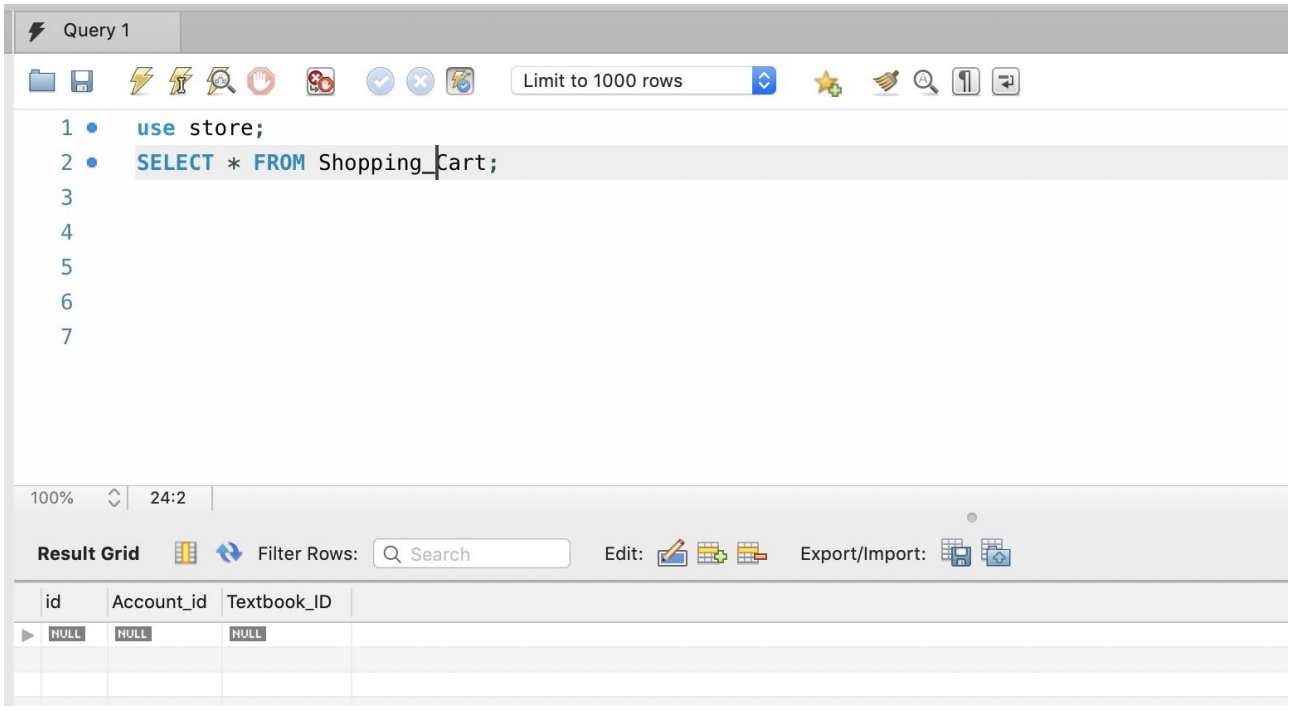


id	Price	Account_id	Textbook_ID	Available
1	300	7	1	1
2	50	13	2	1
3	75	3	3	0
7	78	1	7	1
8	165	1	8	1
9	60	1	9	1
10	98	6	10	0
11	87	8	11	0
12	250	25	12	0
13	50	30	13	1
14	99	20	14	0
16	140	7	15	1
19	150	1	20	1
21	78	33	22	0
23	75	52	24	1
24	30	1	25	1
NULL	NULL	NULL	NULL	NULL

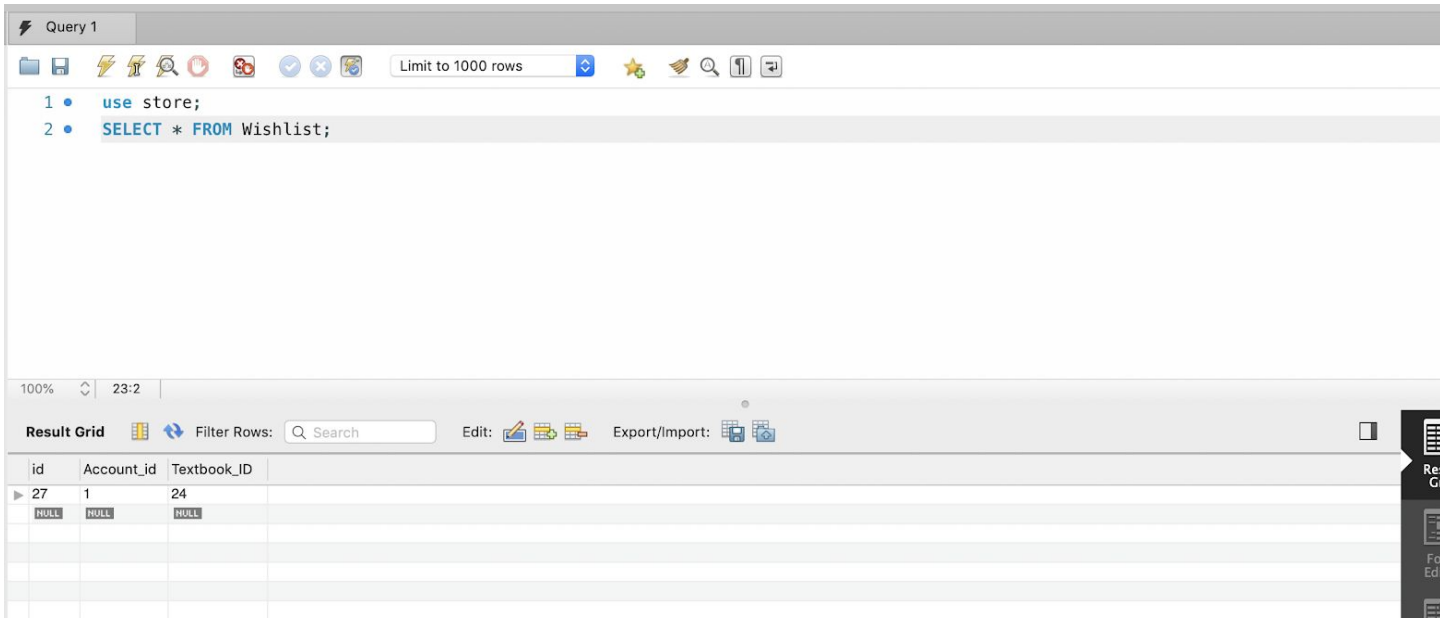
In Listing table, the second to last row is the row that displays account_id 52 (the account I am currently logged into) has listed for sale textbook_id 24 and the status of Available is 1 (available for sale)



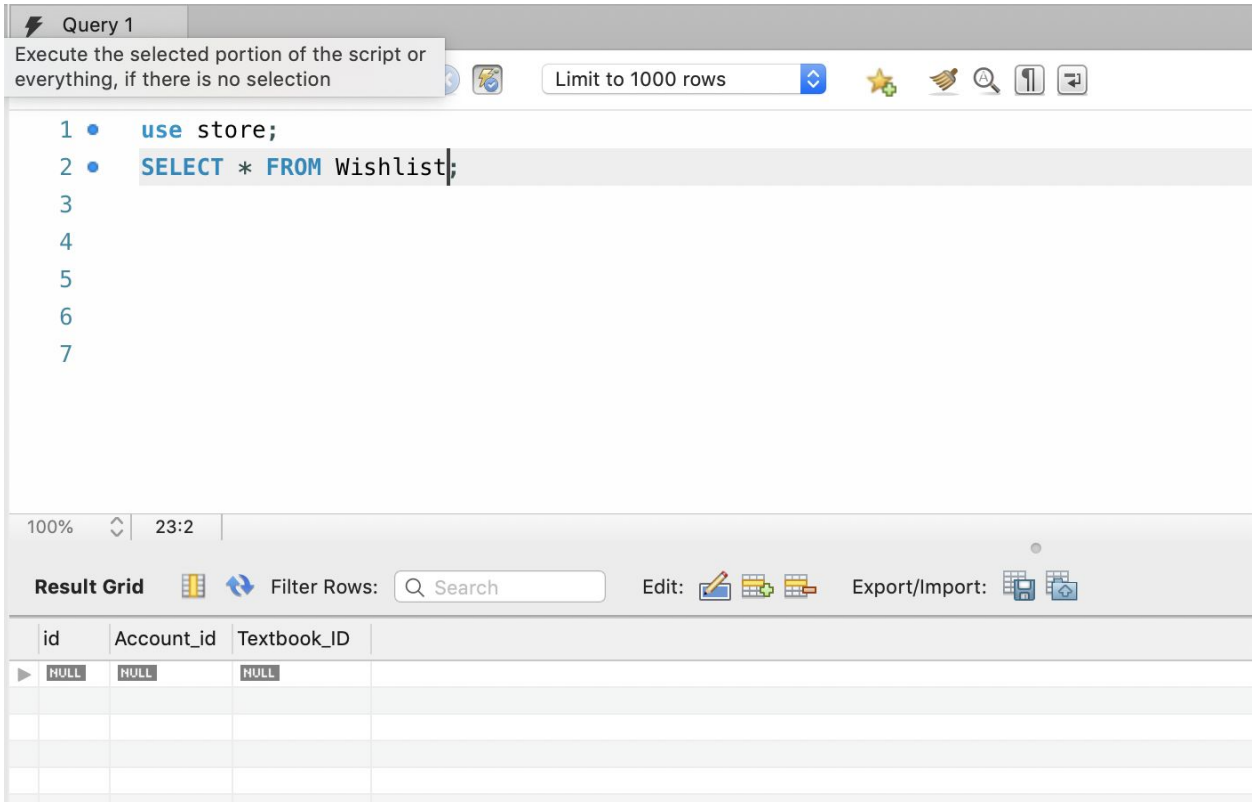
This one row in the Shopping Cart table that the account with id 1 has our textbook id 24 in their shopping cart.



After canceling the listing, the query result returns NULL since deleting the textbook listing also delete the item from every account's shopping cart.



This one row in the Wishlist table shows that the account with id 1 has our textbook id 24 in their wishlist.



After canceling the listing, the query result returns NULL as deleting the textbook listing also delete it from every account's wishlist.

BACKEND LOGIC

```
@login_required
@require_POST
@csrf_exempt
def cancel_listing_request(request):
    context={}
    if request.is_ajax() == True:
        textbook_id = request.POST.get('textbook-id')
        with connection.cursor() as cursor:
                # DELETE all Category_Has_Textbook, Listing, Wishlist, Shopping_Cart rows that the textbook belongs to
                # and then delete the Textbook
            cursor.execute("DELETE FROM Category_Has_Textbook WHERE Textbook_ID = %s;", [textbook_id])
            cursor.execute("DELETE FROM Listing WHERE Textbook_ID = %s;", [textbook_id])
            cursor.execute("DELETE FROM Wishlist WHERE Textbook_ID = %s;", [textbook_id])
            cursor.execute("DELETE FROM Shopping_Cart WHERE Textbook_ID = %s;", [textbook_id])
            cursor.execute("DELETE FROM Textbook WHERE Textbook_ID = %s;", [textbook_id])
        connection.close()
        context['message'] = 'Success'
        context['redirect'] = reverse('homepage')
    else:
        context['message'] = 'Fail'
    return JsonResponse(context)
```

To cancel a textbook listing, I need to delete all relevant information about the textbook listing from my database.

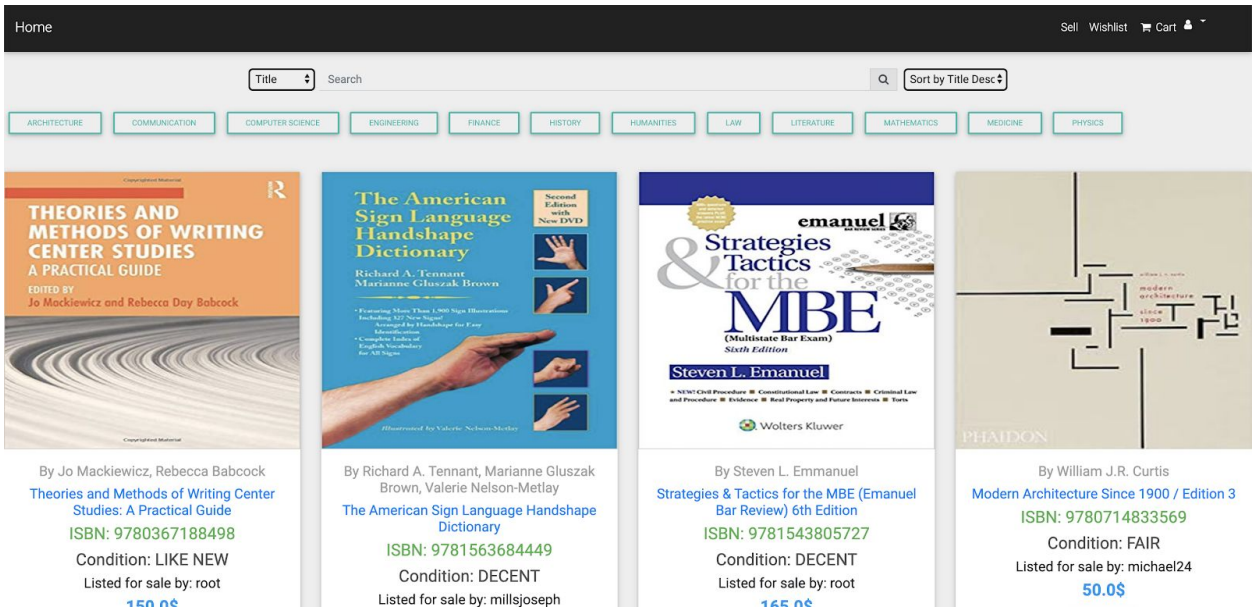
```
cursor.execute("DELETE FROM Category_Has_Textbook WHERE Textbook_ID = %s;",
[textbook_id])
cursor.execute("DELETE FROM Listing WHERE Textbook_ID = %s;", [textbook_id])
cursor.execute("DELETE FROM Wishlist WHERE Textbook_ID = %s;", [textbook_id])
cursor.execute("DELETE FROM Shopping_Cart WHERE Textbook_ID = %s;", [textbook_id])
cursor.execute("DELETE FROM Textbook WHERE Textbook_ID = %s;", [textbook_id])
```

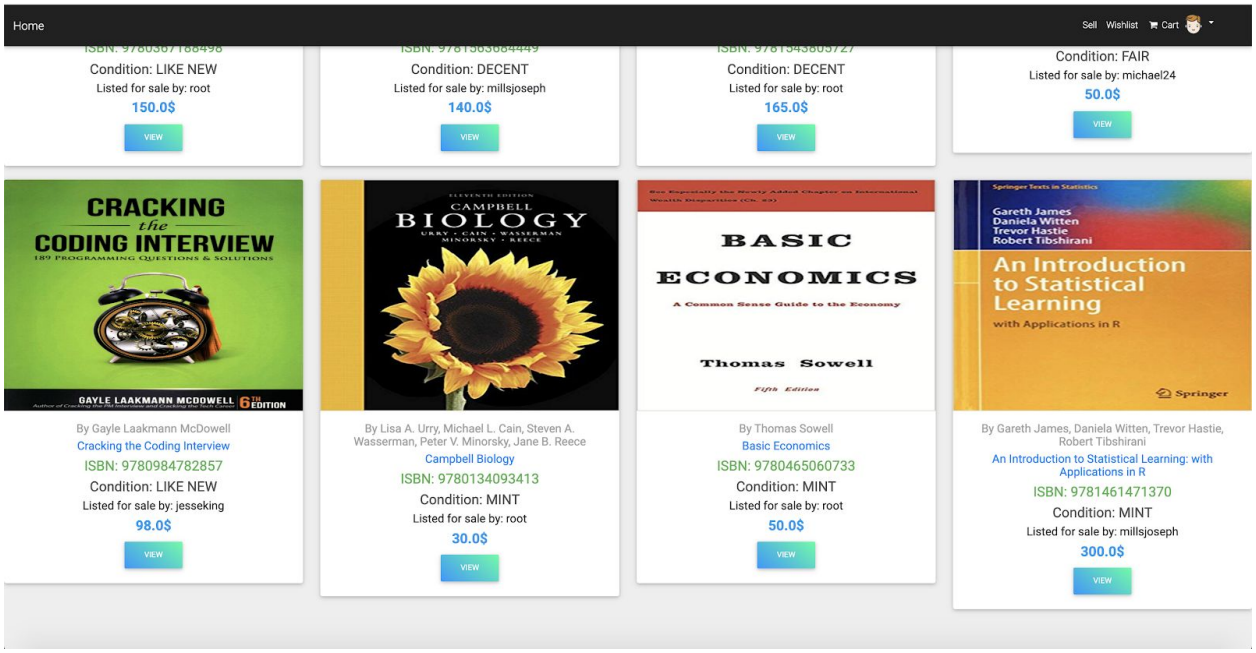
I delete all category that contains the textbook in Category_Has_Textbook, delete the listing itself in Listing table. Delete the textbook from every account's Wishlist and also delete it from every account's Shopping Cart. Finally, I delete the Textbook entry itself.

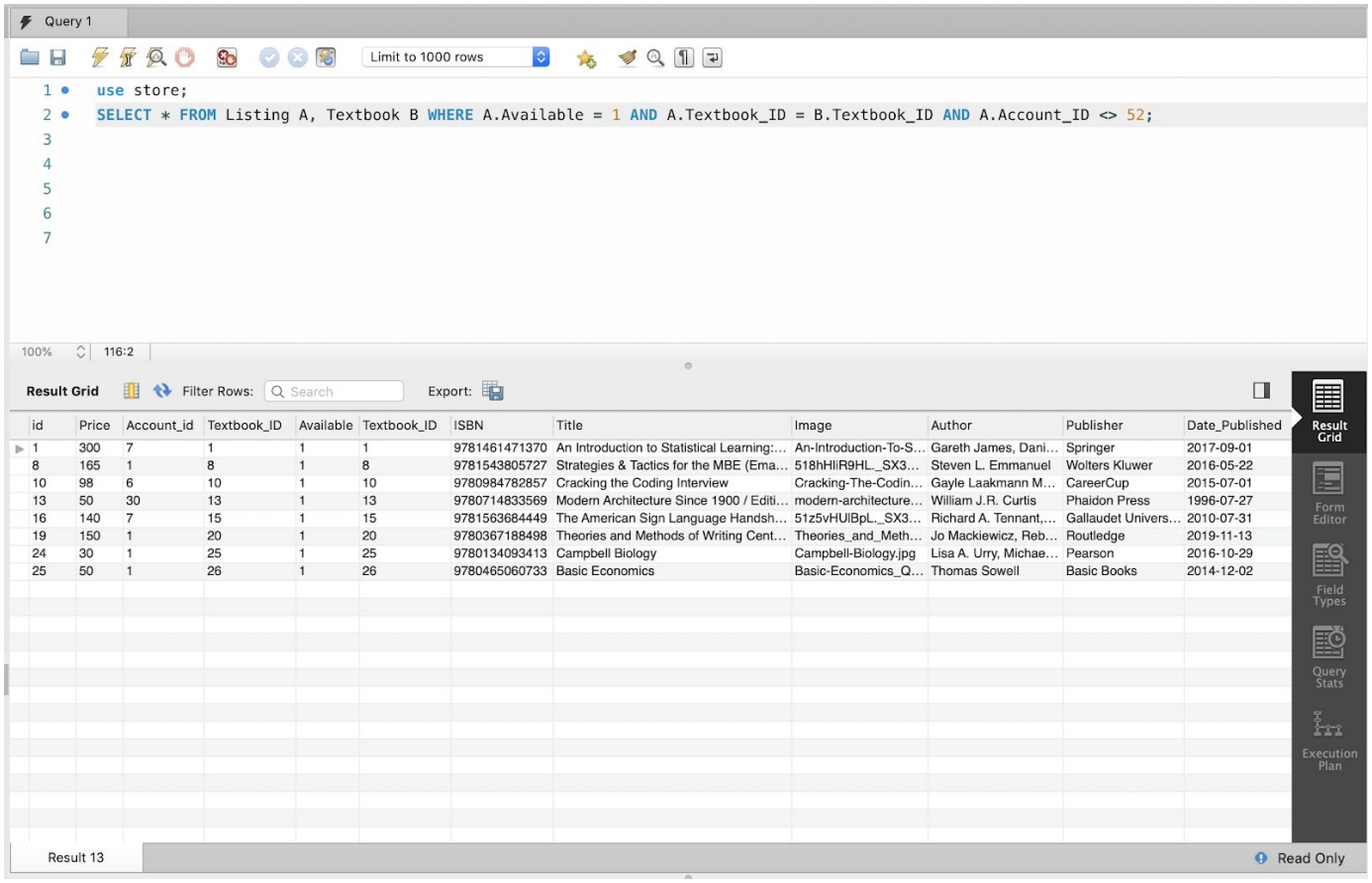
The JsonResponse(context) simply returns a message indicating whether the cancel request has gone correctly or not.

SEARCHCHING TEXTBOOK LISTING CATALOG

You can click on the BROWSE button on the homepage if you want to see the list of available textbook for sale (listed by other users of course). If your database is new and has no textbook listed by other accounts then you won't see anything.

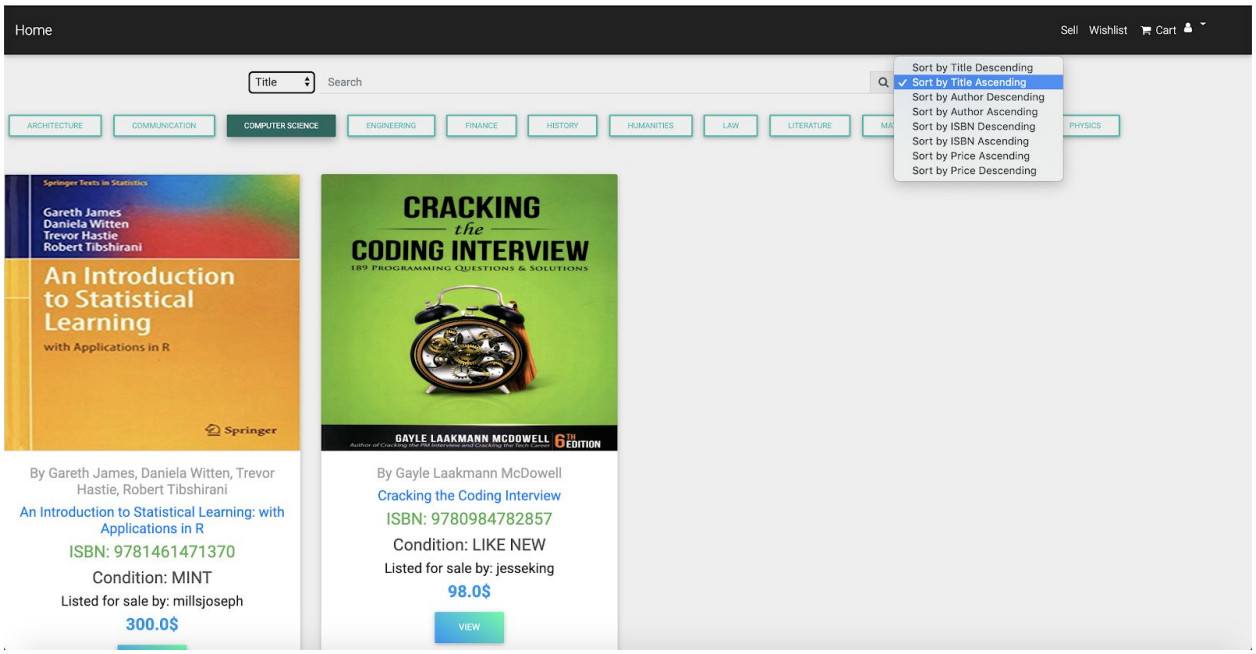


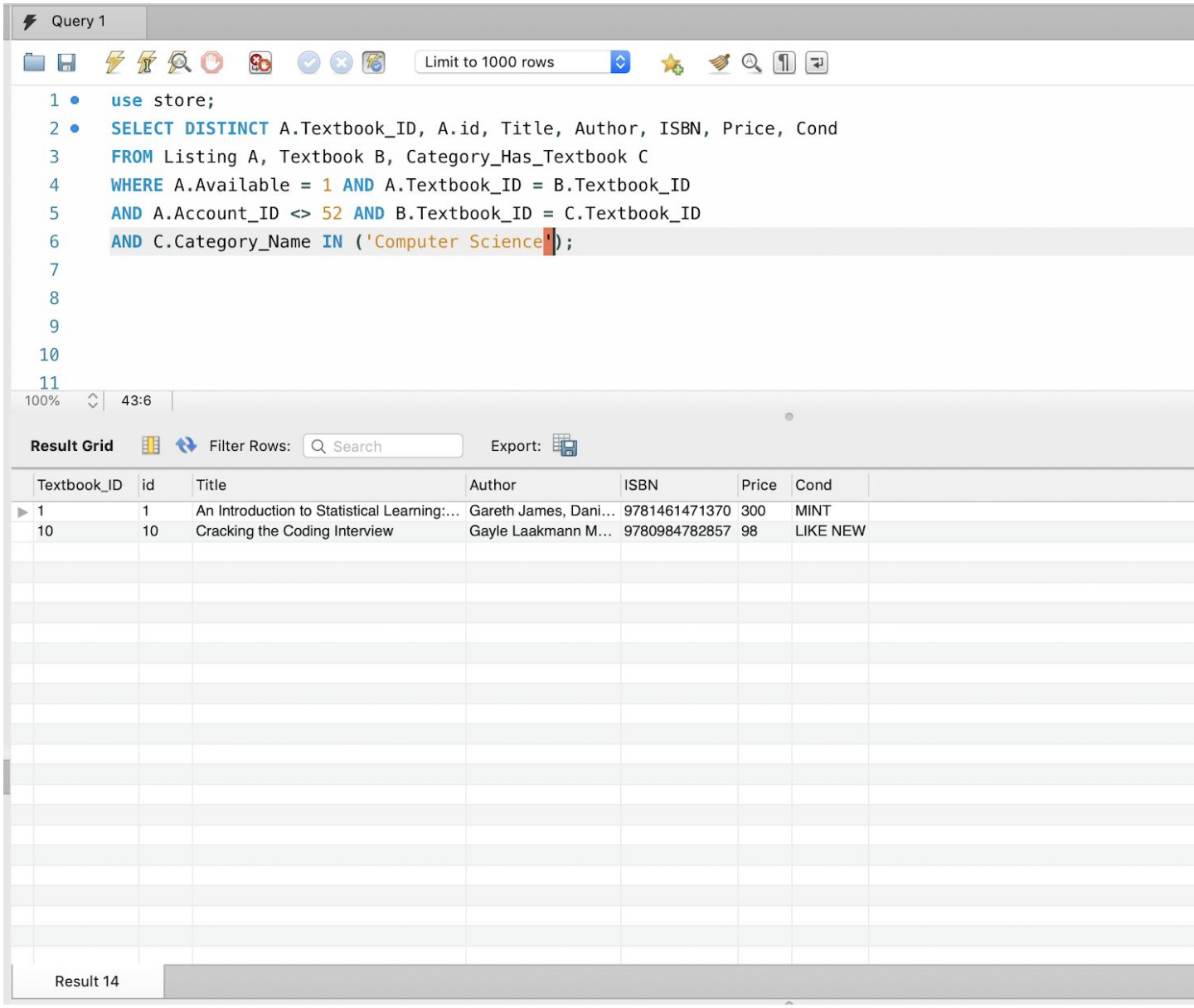




This is the query used to return the results shown above

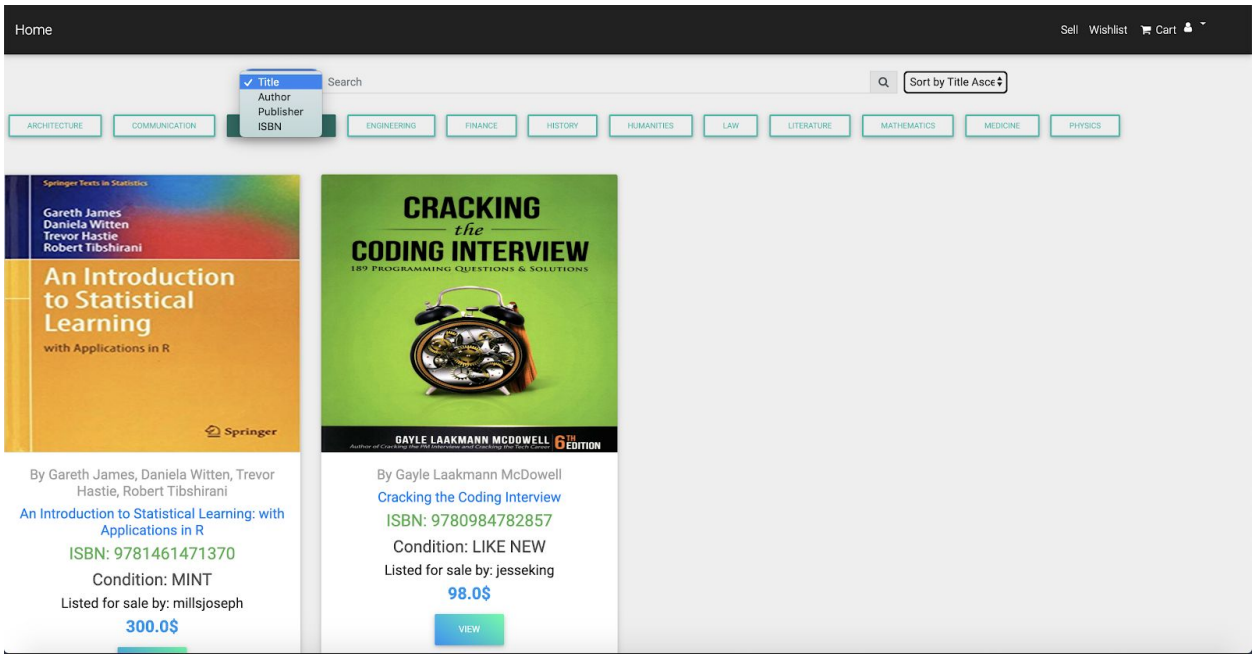
You can press on the green button which is the list of Category and it will update the page to show only textbooks of that category. If 2 or more category is selected, it will shows all the textbook that belongs to at least 1 of those category.





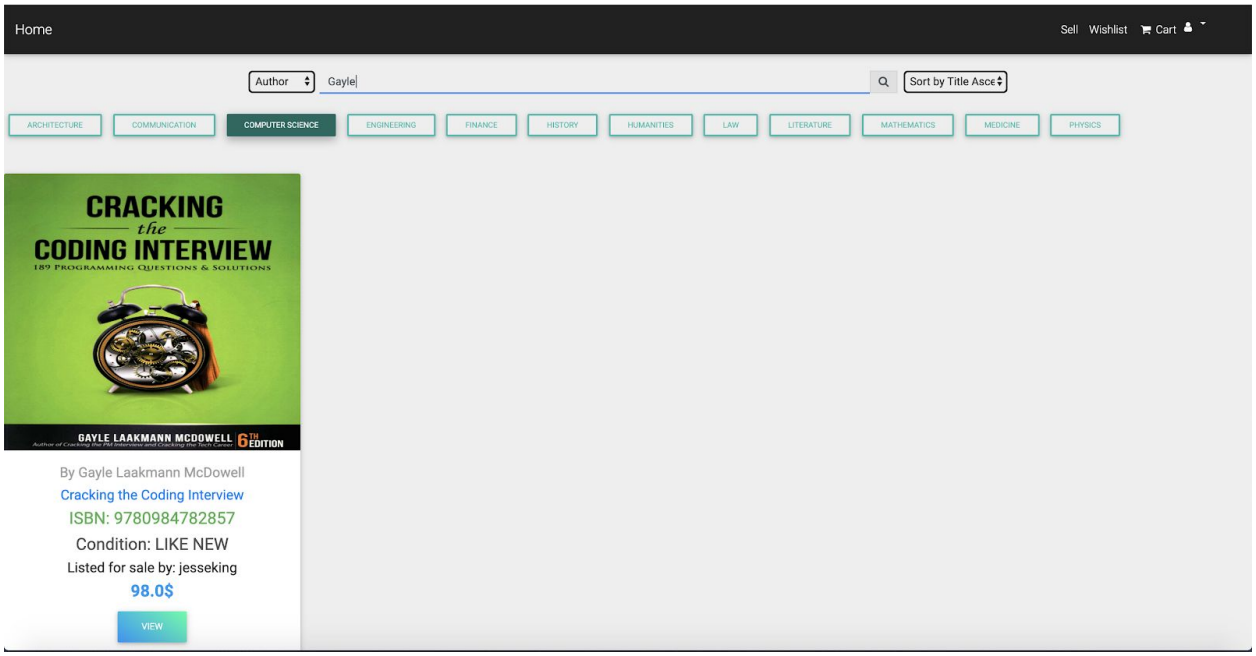
This is the query used to show the result on the last page

You can choose from a dropdown list to the right for sort by options.

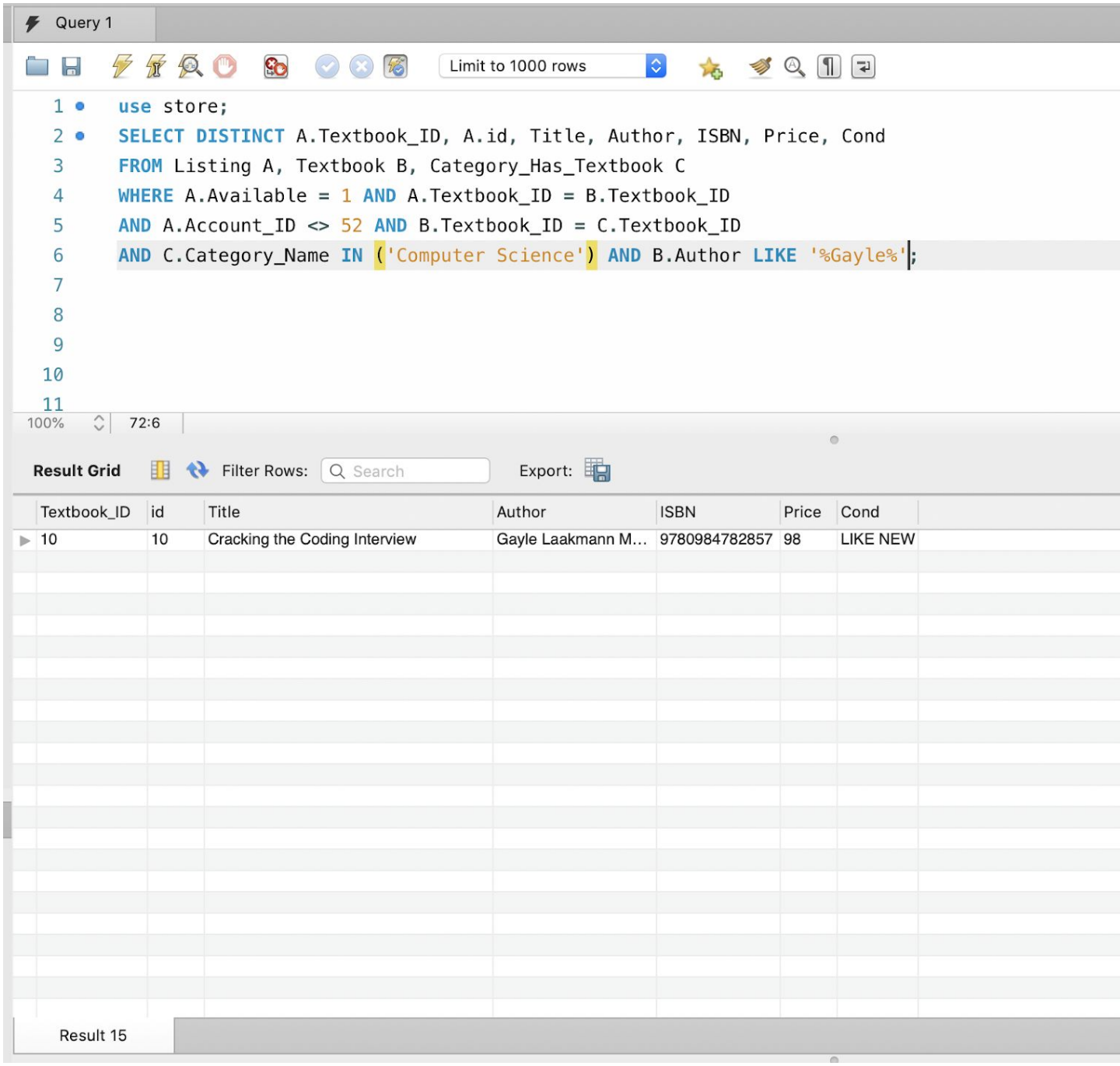


You can also clicks the dropdown option to the left to choose whether you want to search by

Title, Author, Publisher, or ISBN



As you can see, depending on what category pressed, what the filter is, and the text in the search bar it will return the result accordingly.



This is the query used to show the result on the last page

BACKEND LOGIC:

```
603
604 @login_required
605 def search(request):
606
607     # Query all the Categories and textbook Listings in the database
608     Categories = Category.objects.raw("Select * FROM Category")
609     search_query = """
610     Select *
611     FROM Listing A, Textbook B
612     WHERE A.Textbook_ID = B.Textbook_ID AND A.Available = 1
613     AND A.Account_ID <> """ + str(request.user.id) + """ ORDER BY Title DESC;
614     """
615     Listings = Listing.objects.raw(search_query)
616
617     return render(request, 'search.html', context={'Categories': Categories, 'listings': Listings});
618
```

When you first click on browse, this is the function that handles the search page view for displaying every single textbook listings

---

```
Categories = Category.objects.raw("Select * FROM Category")
```

Straightforward since I simply select all rows from Category table

```
search_query =
"""
    Select *
    FROM Listing A, Textbook B
    WHERE A.Textbook_ID = B.Textbook_ID AND A.Available = 1
    AND A.Account_ID <> """ + str(request.user.id) + """ ORDER BY Title
    DESC;
"""
```

I join Listing table and Textbook table where Listing.Textbook_ID = Textbook.Textbook_ID and Listing.Available = 1 (available for sale) And A.Account_ID <> request.user.id which get the listings not listed by the logged in user (you), and by default it is order by Title desc

This function then return a render of search.html and it passed in the two query results for rendering

```python

@login_required
@csrf_exempt
def search_request(request):

    results = None;
    if request.is_ajax() == True:
        Categories = json.loads(request.GET.get('Categories'))
        Sort_ID = request.GET.get('Sort')
        text = request.GET.get('search-text')
        filter = request.GET.get('select-filter')
        sort = sort_order(Sort_ID)

        if len(Categories) == 0:
            # If no Category option is selected and search-bar text is empty, then simply returns a
            # search query containing every textbook listing ordered by selected sorting order
            # Else, search for all textbook listings where the filter such as ISBN, Title, Author matches the pattern
            # in the search bar
            if text == '':
                results = Listing.objects.raw("SELECT * FROM Listing A, Textbook B WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID AND A.Account_ID <> "\
                + str(request.user.id) + " "  + sort + ";")
            else:

                results = Listing.objects.raw("SELECT * FROM Listing A, Textbook B WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID AND A.Account_ID <> "\
                 + str(request.user.id) + " AND " + filter + " LIKE '%" + text + "%' " + sort + ";")

        else:
            # If a Category is selected, do the same as above but this time adds condition to ensure that
            # the textbook belongs to at least 1 of the category selected
            query = """
            SELECT DISTINCT A.Textbook_ID, A.id, Title, Author, ISBN, Price, Cond
            FROM Listing A, Textbook B, Category_Has_Textbook C
            WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID
            AND A.Account_ID <> """ + str(request.user.id) + """ AND B.Textbook_ID = C.Textbook_ID
            AND C.Category_Name IN (
            """
            for category in Categories:
                query += "'" + Categories[category] + "', "
            if text == '':
                query = query[:-2] + ") " + sort + ";"
                results = Listing.objects.raw(query)
            else:
                query = query[:-2] + ") AND " + filter + " LIKE '%" + text + "%' " + sort + ";"
                results = Listing.objects.raw(query)
    return render(request, 'search_results.html', context={'listings': results})

```

This is the function that handles when the user for example changes the sort options, select category buttons to display only textbooks in those categories, and when the user types in the search bar.

Categories is list of categories selected by user, Sort_ID is the sort by option, text is the text in the search bar, filter is whether you search by title, author, isbn etc

FIRST CASE:

If no category option is selected and the text in the search bar is empty, then my search query is

---

```
SELECT * FROM Listing A, Textbook B WHERE A.Available = 1 AND A.Textbook_ID =
B.Textbook_ID AND A.Account_ID <> request.user.id + sort
```

Join the table Listing and Textbook

WHERE Listing.Available = 1 (available for sale)

AND Listing.Textbook_ID = Textbook.Textbook_ID

AND Listing.Account_id != request.user.id (person listed isn't the logged in account) and the + sort represents the sorting option (Order by title asc, author desc etc).

SECOND CASE:

If there is no category option selected but there is text in the search bar however then my search query become

---

```
SELECT * FROM Listing A, Textbook B WHERE A.Available = 1 AND A.Textbook_ID =
B.Textbook_ID AND A.Account_ID <> request.user.id AND filter LIKE '%text%' + sort
```

The only difference is 1 more condition filter LIKE ‘%text%’ where the value of filter is (Author, ISBN, Title, Publisher) and text is the text in the search bar. Basically returns all rows where the filtered column has text like what is contained in the search bar.

LAST CASE:

If category options ARE selected, then this section of code runs

```
query =
"""
   SELECT DISTINCT A.Textbook_ID, A.id, Title, Author, ISBN, Price, Cond
   FROM Listing A, Textbook B, Category_Has_Textbook C
   WHERE A.Available = 1 AND A.Textbook_ID = B.Textbook_ID
   AND A.Account_ID <> """ + str(request.user.id) + """ AND B.Textbook_ID
   = C.Textbook_ID
   AND C.Category_Name IN (

"""
for category in Categories:
      query += "'" + Categories[category] + "', "
      if text == '':
          query = query[:-2] + ") " + sort + ";"
          results = Listing.objects.raw(query)
      else:
          query = query[:-2] + ") AND " + filter + " LIKE '%" + text + "%' " + sort +
";"
```

```
        results = Listing.objects.raw(query)
```

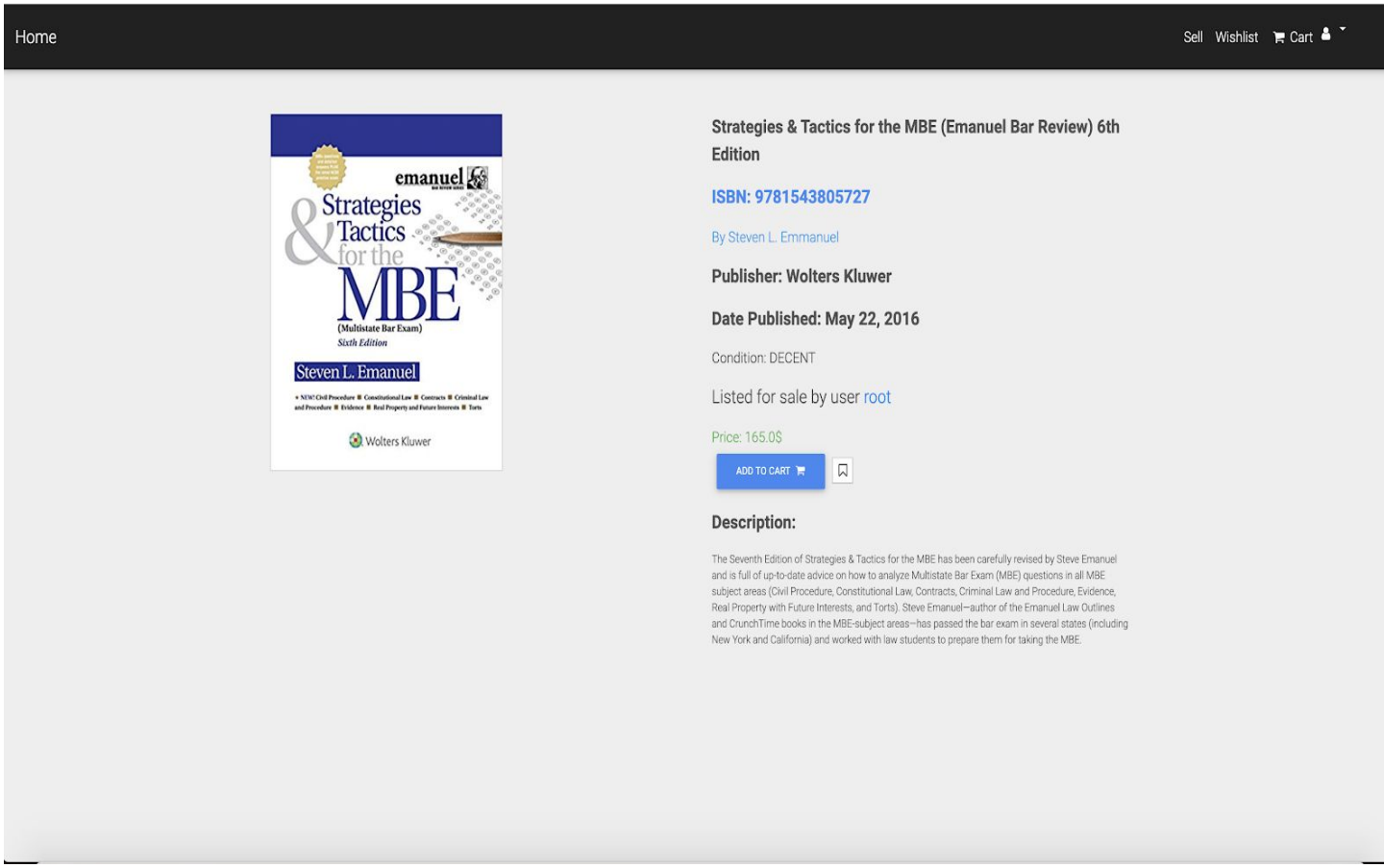
I join table Listing, Textbook, and Category_Has_Textbook where Listing.Available = 1, Listing.Textbook_ID = Textbook.Textbook_ID, A.Account_ID <> request.user.id (logged in account), Textbook.Textbook_ID = Category_Has_Textbook.Textbook_ID AND C.Category_Name IN ().

Notice the C.Category_Name IN (). I am doing string manipulation to adds the list of category to the IN operator which will returns to me any textbooks that belong to at least 1 of the category selected.
Also, I am selecting by DISTINCT Textbook_ID since 1 textbook can belong to multiple Category, it will have multiple Category_Has_Textbook rows which joined together will give me multiple rows with the same Textbook_ID.

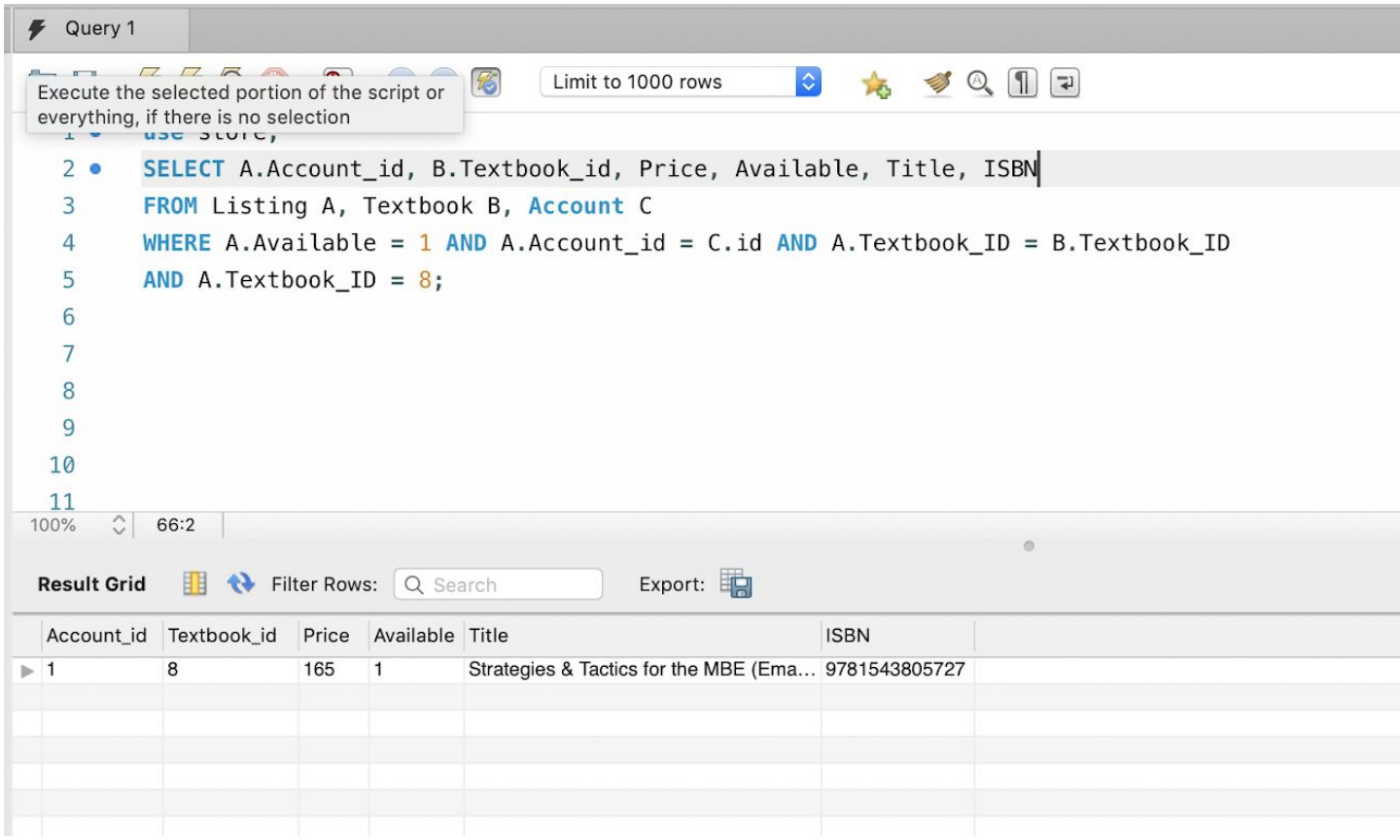
If the text is empty, then perform the query with the sort option added to the string.
If the text is NOT empty, add the filter LIKE '%text%' similar to the 2nd case and then the sort option and then perform the query

Then finally this function render search_results.html and passes the query results into the render function.

VIEW PRODUCT PAGE:



You can click on the view button of any textbook listings not your own to be shown a product page displaying all the information about the listing. If this listing is already in the user's shopping cart, then the Add to Cart button will be changed to "ALREADY IN SHOPPING CART" so that the user can't add it to their shopping cart again. Likewise, if the listing is already in the user's wish list, the icon next to the Add to Cart button will be displayed in bold.



This is the result of view product page. I purposely choose a few specific columns instead of all

* like in the actual query so that the image would fit.

```
@login_required
def view_product_page(request, textbook_id):
    query = """
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE A.Available = 1 AND A.Account_id = C.id AND A.Textbook_ID = B.Textbook_ID AND A.Textbook_ID = %s
    """
    listing = Listing.objects.raw(query, [textbook_id])[0];

    Cart = Shopping_Cart.objects.raw("SELECT * FROM Shopping_Cart WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])
    Wish_list = Wishlist.objects.raw("SELECT * FROM Wishlist WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])
    Cart = Cart[:]
    Wish_list = Wish_list[:]
    Listing_In_Cart = False
    Listing_In_Wishlist = False
    if len(Cart) == 1:
        Listing_In_Cart = True
    if len(Wish_list) == 1:
        Listing_In_Wishlist = True
    # If the listing is listed by the user, then return a view that lets the user edit the listing information instead
    if listing.username == request.user.username:
        Category_Query = """
        SELECT id, A.Category_Name
        FROM Category_Has_Textbook A, Category B
        WHERE B.Category_Name = A.Category_Name AND A.Textbook_ID = %s
        """
        Categories = Category.objects.raw(Category_Query, [textbook_id])

        # This part retrieves the information from the listing query at the beginning and formats it into a dictionary
        # the dictionary is then used to initialize a TextbookChangeForm to create an edit listing information form
        # prefilled with the textbook listing information
        data = {'ISBN': listing.ISBN,'Title': listing.Title,'Author': listing.Author,'Publisher': listing.Publisher,'Cond': listing.Cond,
                'Date_Published': listing.Date_Published, 'Price': listing.Price, 'Description': listing.Description,'Image': listing.Image
                ,'Category': Categories}
        form = forms.TextbookChangeForm(initial=data)
        return render(request, 'My_Product_Page.html', context={'form': form, 'listing': listing})

    return render(request, 'Product_Page.html', context={'listing': listing, 'Cart': Listing_In_Cart, 'Wishlist': Listing_In_Wishlist})
```

The view_product_page function takes in an argument textbook_id used to identify which textbook we want to view.

Viewing product page of a listing that is not your own is done in line 190-206 and the return on line 225

First query is

```
query =
"""
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE A.Available = 1 AND A.Account_id = C.id AND A.Textbook_ID =
    B.Textbook_ID
    AND A.Textbook_ID = %s
```

```
"""
listing = Listing.objects.raw(query, [textbook_id])[0];
```

Join Listing, Textbook, Account table based on Listing.Available = 1 (available for sale), where Account_id of Listing & Account is the same, and where Textbook_id of Listing & Textbook is the same. This returns a relation of a single row since Textbook_ID is a primary key and is thus unique.

Then,

```
Cart = Shopping_Cart.objects.raw("SELECT * FROM Shopping_Cart
WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])

Wish_list = Wishlist.objects.raw("SELECT * FROM Wishlist
WHERE Account_ID = %s AND Textbook_ID = %s", [str(request.user.id), textbook_id])
```

These two query find ALL rows of Wishlist and Shopping Cart where Account_ID is equal to logged in user's account id and Textbook_ID equals to the textbook we want to view. This returns a relation of maximum 1 row since Account_id and Textbook_ID is unique for each row of Wishlist and Shopping Cart.

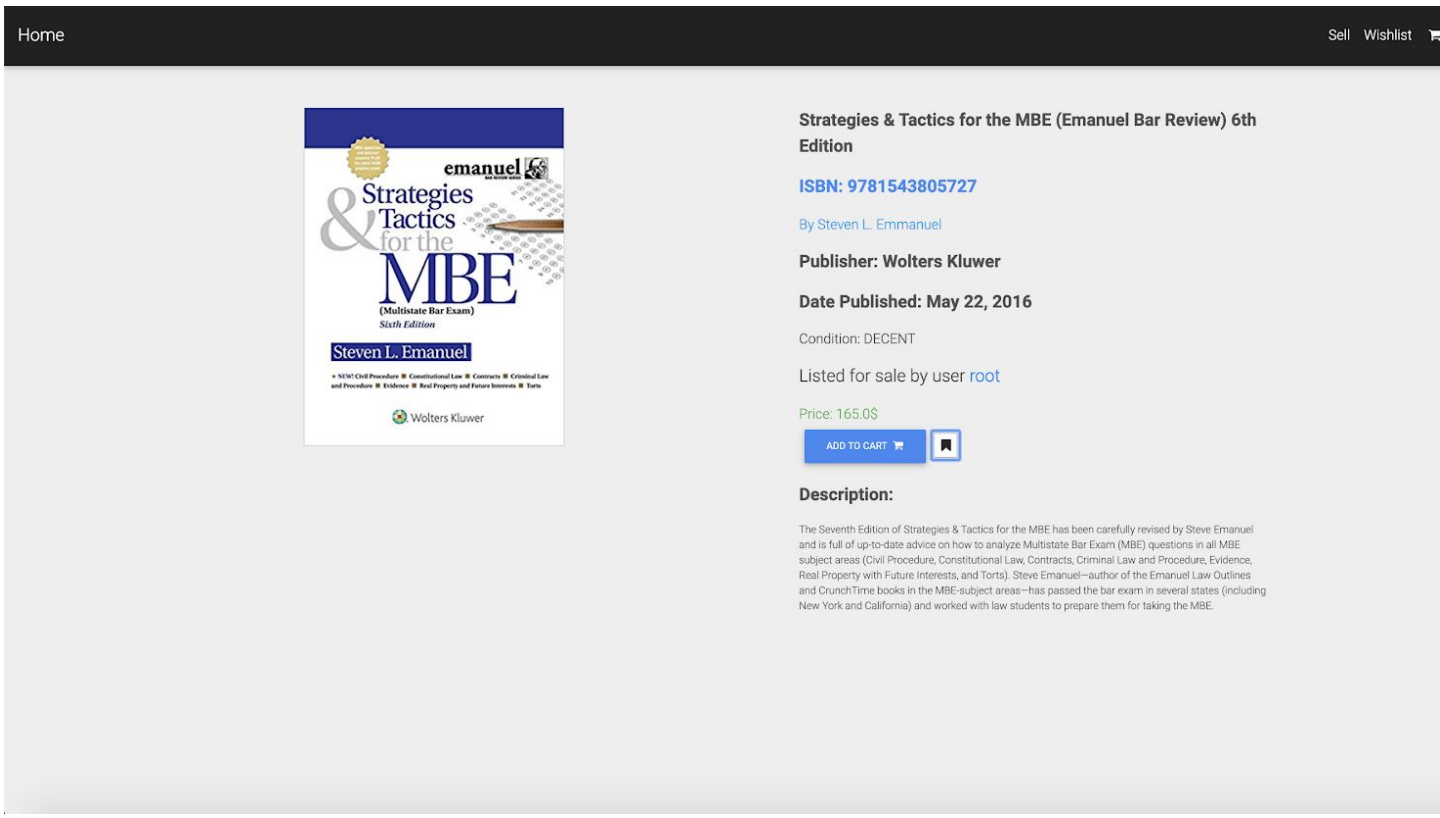
```
    if len(Cart) == 1:
        Listing_In_Cart = True
    if len(Wish_list) == 1:
        Listing_In_Wishlist = True
```

This checks if the returned number of row is 1 then we know that the textbook is in the user's shopping cart or query

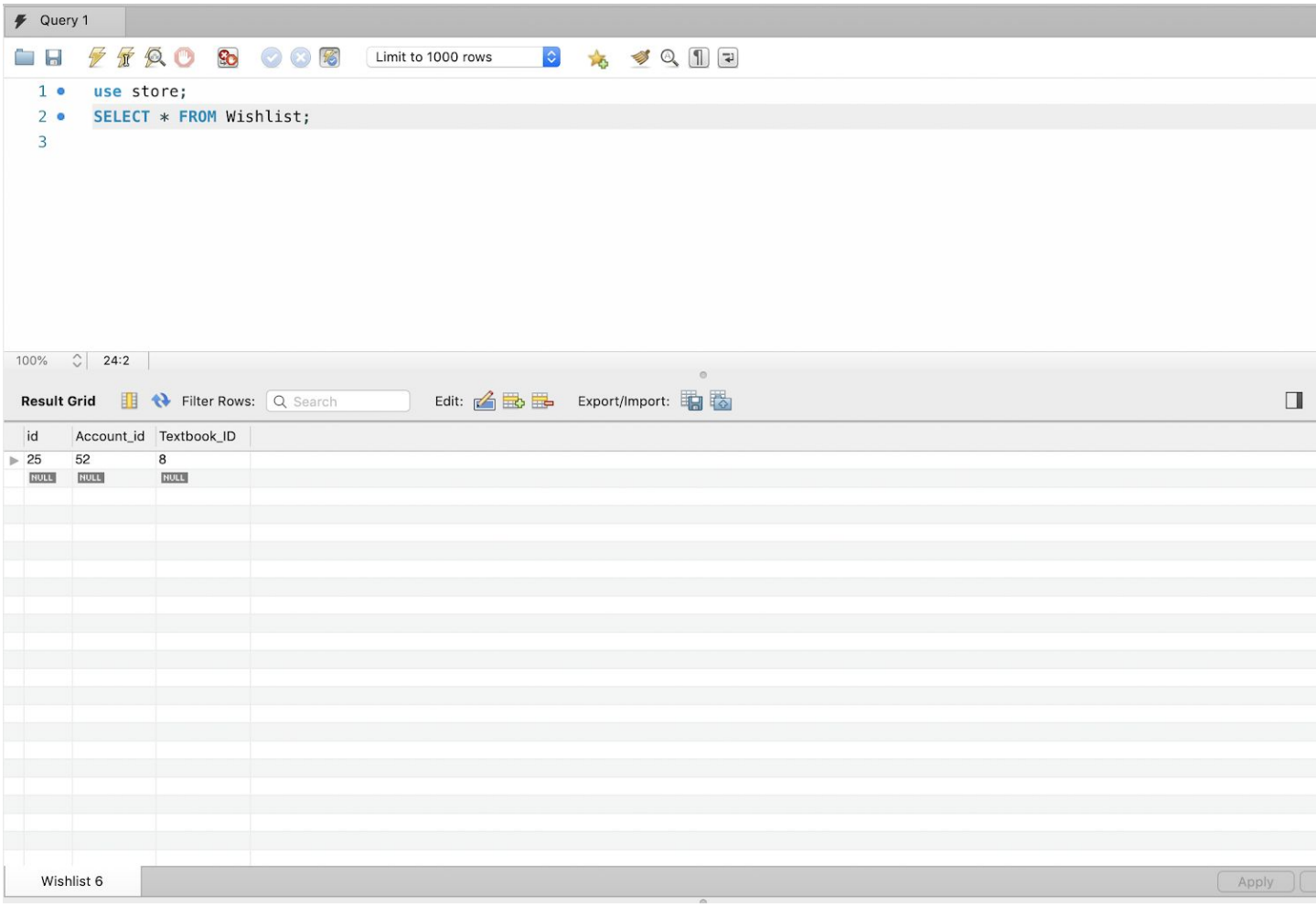
Then the function return a render of Product_Page.html passing in the results of listing query and two boolean variables to see whether the textbook is in the user's shopping cart and wish list.

ADD TO WISHLIST

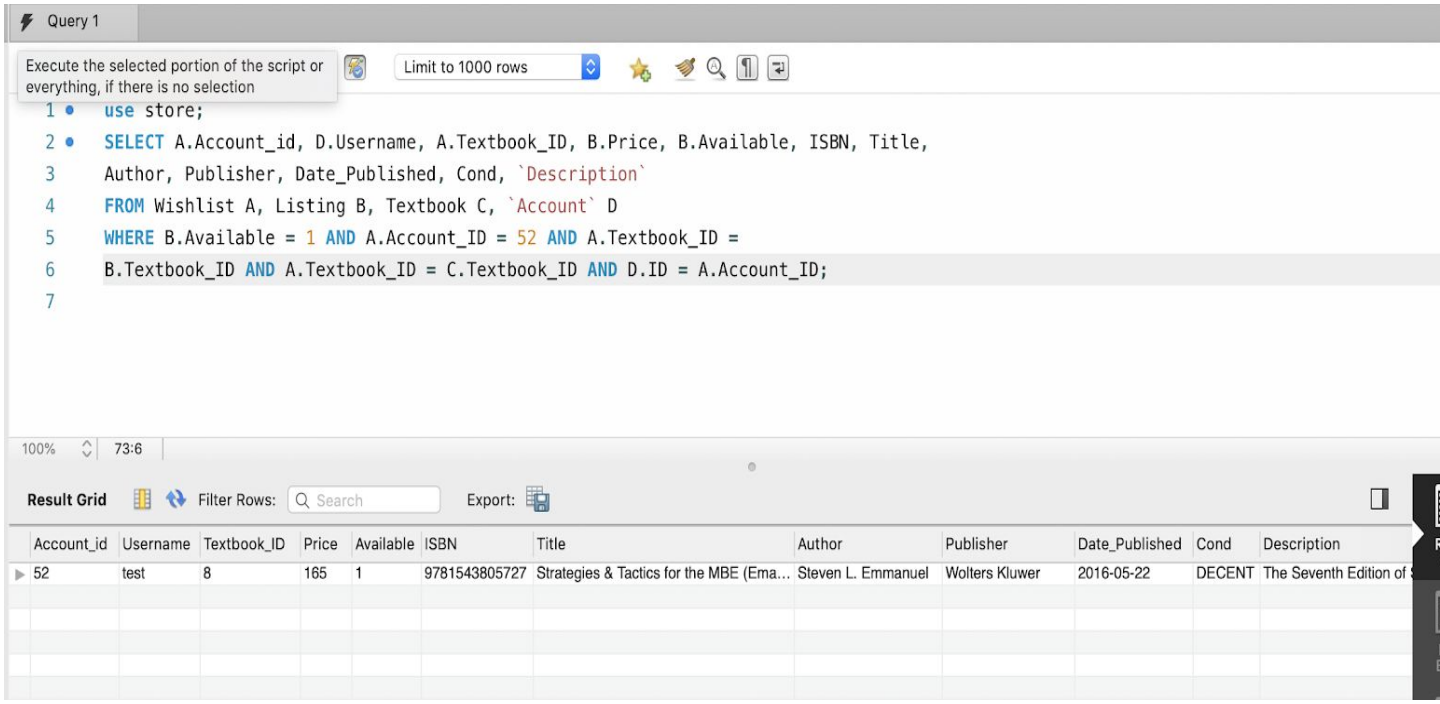
For this feature, I will add one row to the Wishlist table.



After clicking on the little icon next to the Add to Cart button, it will be displayed in bold which indicates that the item has been added to your wishlist



A simple SELECT * From Wishlist query shows that a new row has been added to Wishlist table representing that account_id 52 has textbook_id 8 in its Wishlist.



A more complicated query clearly shows the information of textbook with id 8 and account with id 52

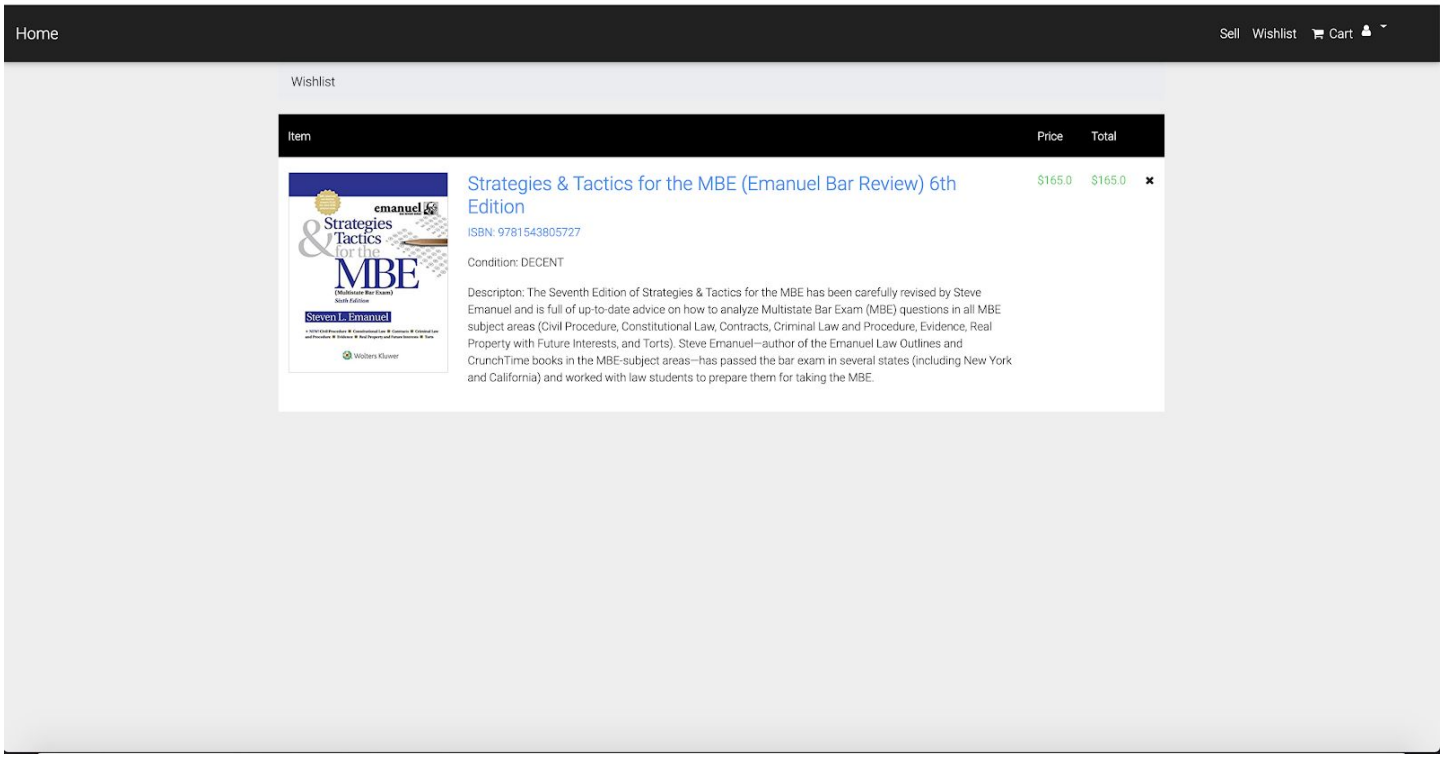
```
@login_required
@csrf_exempt
@require_POST
def add_to_wishlist(request):
    if request.is_ajax() == True:
        textbook_id = request.POST.get('textbook_id')

        # Insert a new row into Wishlist
        with connection.cursor() as cursor:
            cursor.execute("INSERT INTO Wishlist(Textbook_ID, Account_ID) VALUES(%s, %s)", [textbook_id, str(request.user.id)])
        connection.close()
        return JsonResponse({})
```

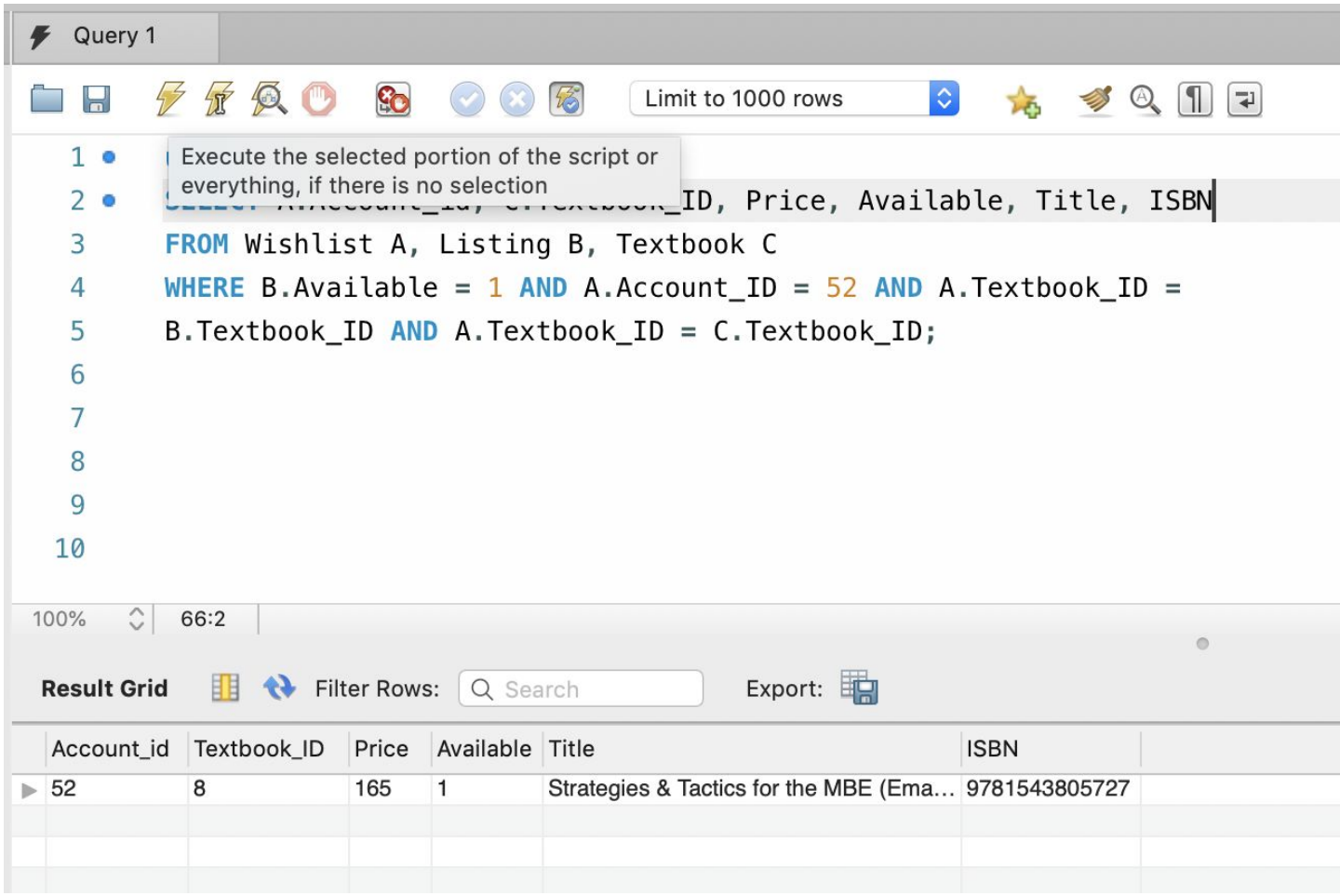
`cursor.execute("INSERT INTO Wishlist(Textbook_ID, Account_ID) VALUES(%s, %s)", [textbook_id, str(request.user.id)])`

To add a new textbook to your wishlist, we only need to insert a new row into the Wishlist table containing the Account_ID and the Textbook_ID. I return an empty JsonResponse because there wasn't anything significant to return.

VIEW WISHLIST:

Click on the Wishlist option on the upper right corner to view the content of your wishlist





This is the result of view wishlist query which matches up with what is shown in the GUI.

```
@login_required
def view_wishlist(request):
    wishlist_query = """
            SELECT *
            FROM Wishlist A, Listing B, Textbook C
            WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
            AND A.Textbook_ID = C.Textbook_ID
            """
    Wish_list= Wishlist.objects.raw(wishlist_query, [str(request.user.id)])
    return render(request, "Wishlist.html",context={'Wishlist': Wish_list})
```

```
wishlist_query =
   """
     SELECT *
     FROM Wishlist A, Listing B, Textbook C
     WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID =
     B.Textbook_ID AND A.Textbook_ID = C.Textbook_ID
   """
Wish_list= Wishlist.objects.raw(wishlist_query, [str(request.user.id)])
```

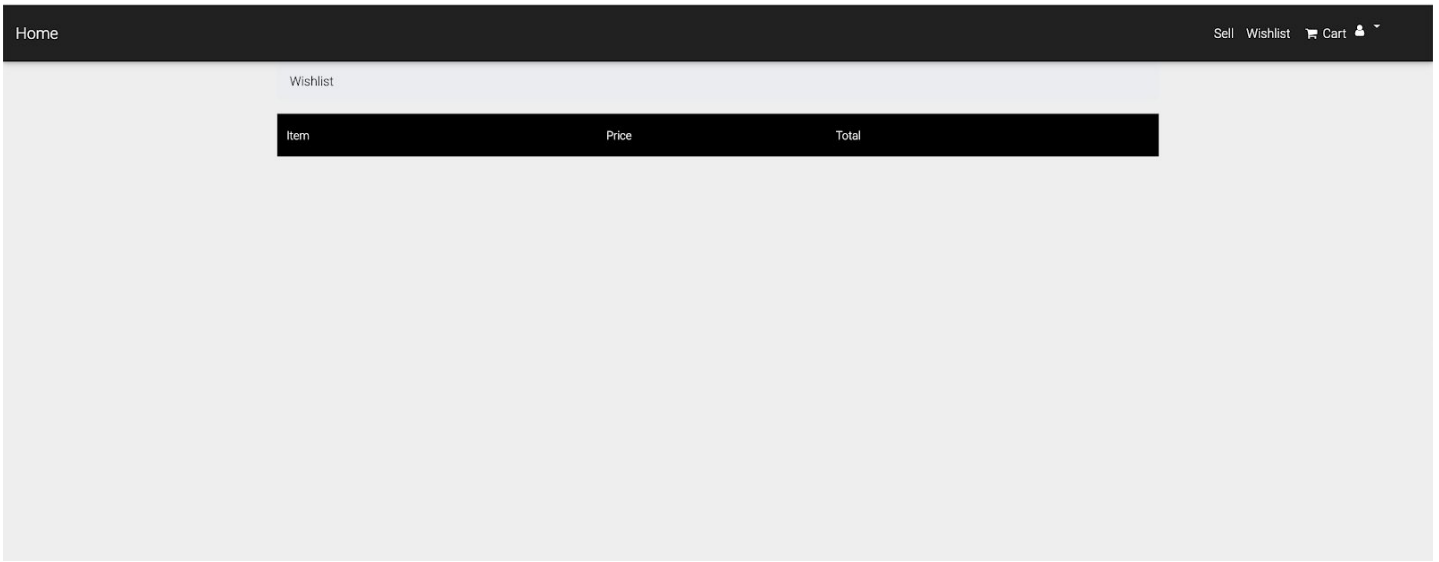
Join table Wishlist, Listing, Textbook where Listing.Available = 1 (available for sale), Account_ID is equals to logged in user's account id, Textbook_ID of Wishlist & Listing & Textbook is the same. This query return a result of all textbooks in the user's wishlist.

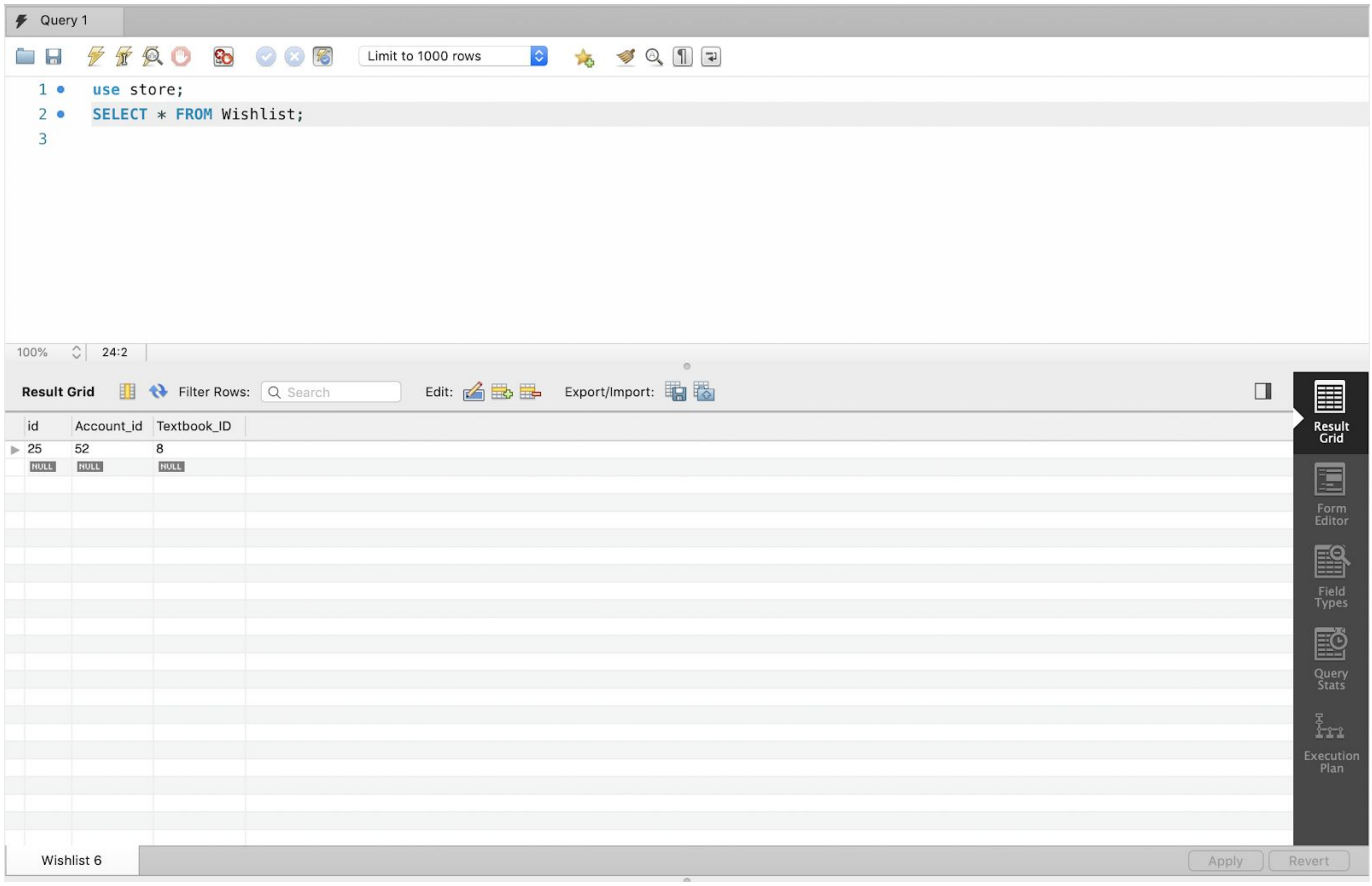
Then it returns a render of Wishlist.html and passing in the results of the Wishlist query

REMOVE FROM WISHLIST

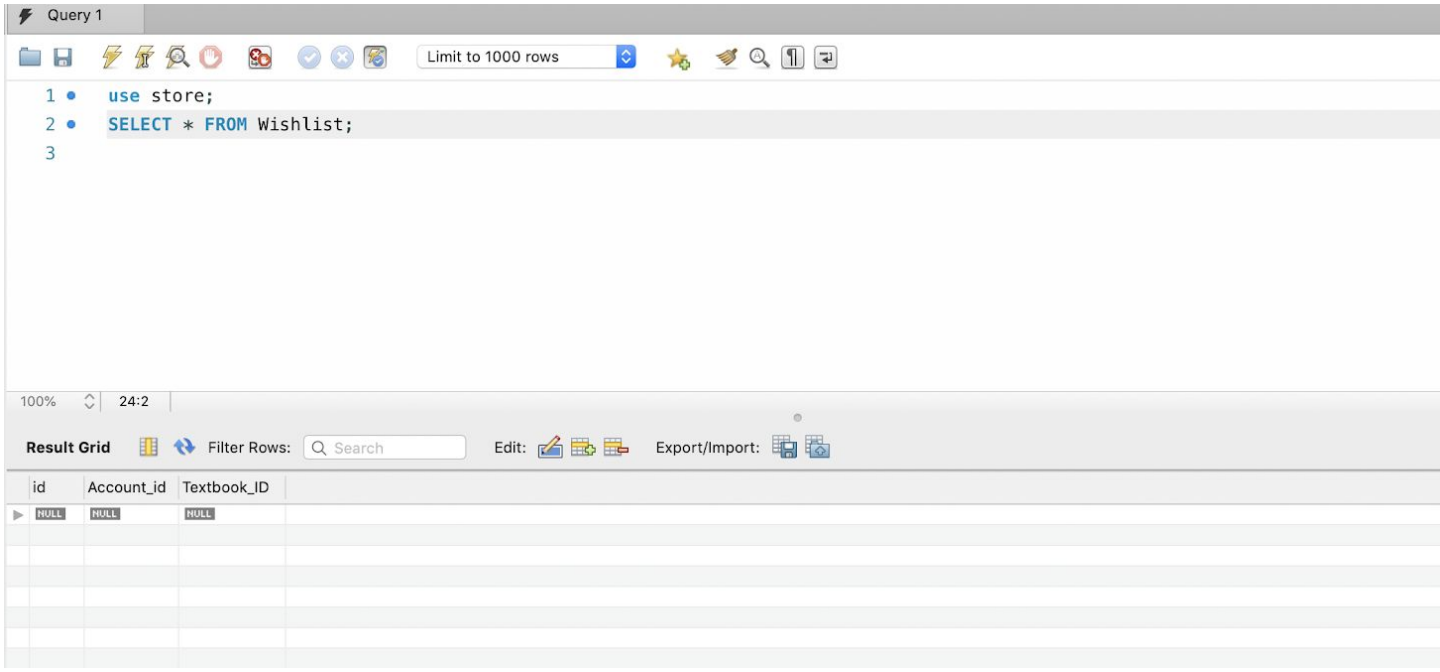
For this feature, I will delete one row from the Wishlist table.

For each textbook listing in the Wishlist table, there is an X icon next to the Total Price column. Clicking on it will removes the textbook from the Wishlist. So click on it, and it will displays an empty table since we removed our only wishlist item.





This is me querying all rows from Wishlist after adding an item to my wishlist earlier.



This is me querying all rows from Wishlist again after clicking on the X icon to remove the item.

Now I returned 0 row since I deleted my only Wishlist entry in the database.

```
@login_required
@csrf_exempt
@require_POST
def remove_from_wishlist(request):
    if request.is_ajax() == True:
        textbook_id = request.POST.get('textbook_id')

        # DELETE a row from Wishlist
        with connection.cursor() as cursor:
            cursor.execute("DELETE FROM Wishlist WHERE Account_ID = %s and Textbook_ID = %s", [str(request.user.id), textbook_id])
        connection.close()

        # This part below requery the rest of the items in the user's wishlist
        wish_list_query = """
        SELECT *
        FROM Wishlist A, Listing B, Textbook C
        WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
        AND A.Textbook_ID = C.Textbook_ID
        """
        Wish_list = Wishlist.objects.raw(wish_list_query, [str(request.user.id)])

        # If the page doesn't need to be refreshed, return False (this is when we remove from wishlist in view product page)
        refresh = request.POST.get('refresh')
        if refresh == 'False':
            return JsonResponse({})
        else:
            # If we remove from wishlist when we are in the wishlist page, then we can render Wishlist_items.html to refresh
            # the page and shows the updated Wishlist
            return render(request, "Wishlist_Items.html",context={'Wishlist': Wish_list})
```

```
cursor.execute("DELETE FROM Wishlist WHERE Account_ID = %s and Textbook_ID = %s",
[str(request.user.id), textbook_id])
```

To remove an item from wishlist, we delete the corresponding row in Wishlist table where account_id = your account id and the Textbook_id of the textbook we want to remove from wishlist.

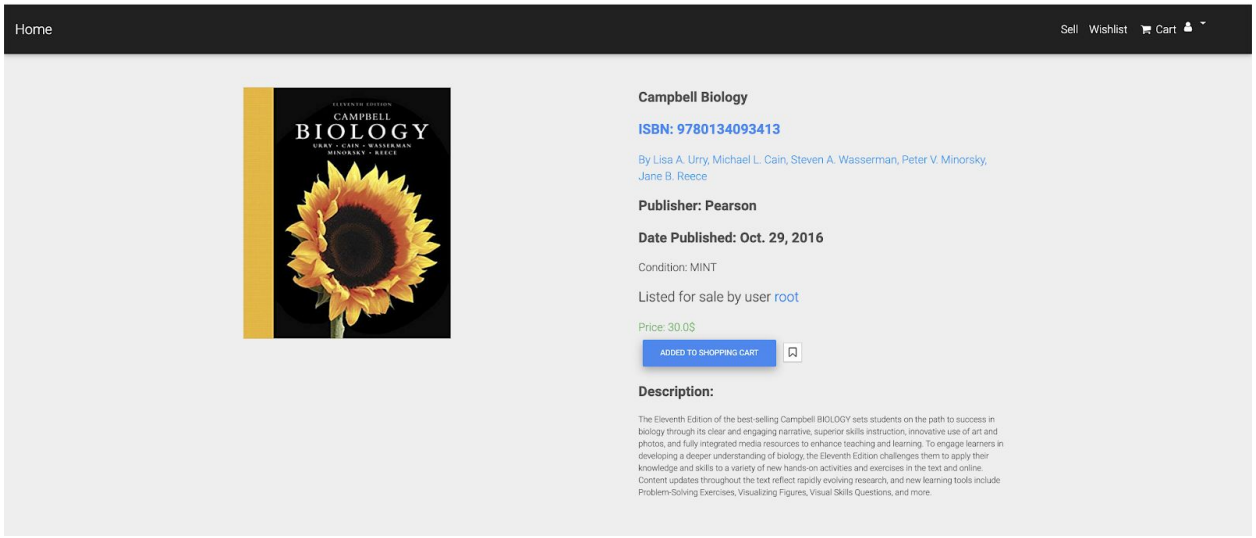
```
wish_list_query =
"""
        SELECT *
        FROM Wishlist A, Listing B, Textbook C
        WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID =
        B.Textbook_ID AND A.Textbook_ID = C.Textbook_ID
"""
```

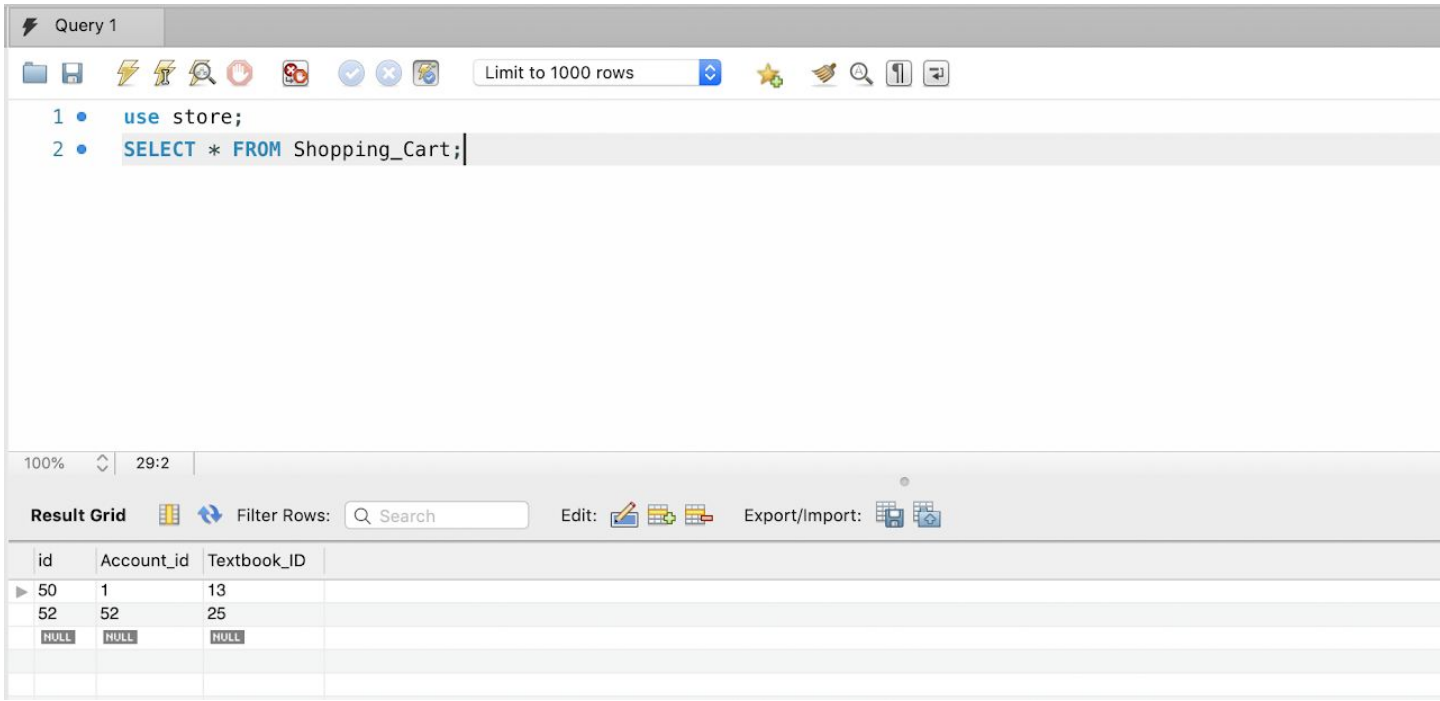
This part requery the user's remaining items in Wishlist after deleting. It join Listing and Textbook simply to get all of the information about the textbook listing. This query is only done so the results can be passed into the render function that render Wishlist_Items.html below so that the Wishlist page can be refreshed with the correct information after deleting a textbook.

ADD TO SHOPPING CART

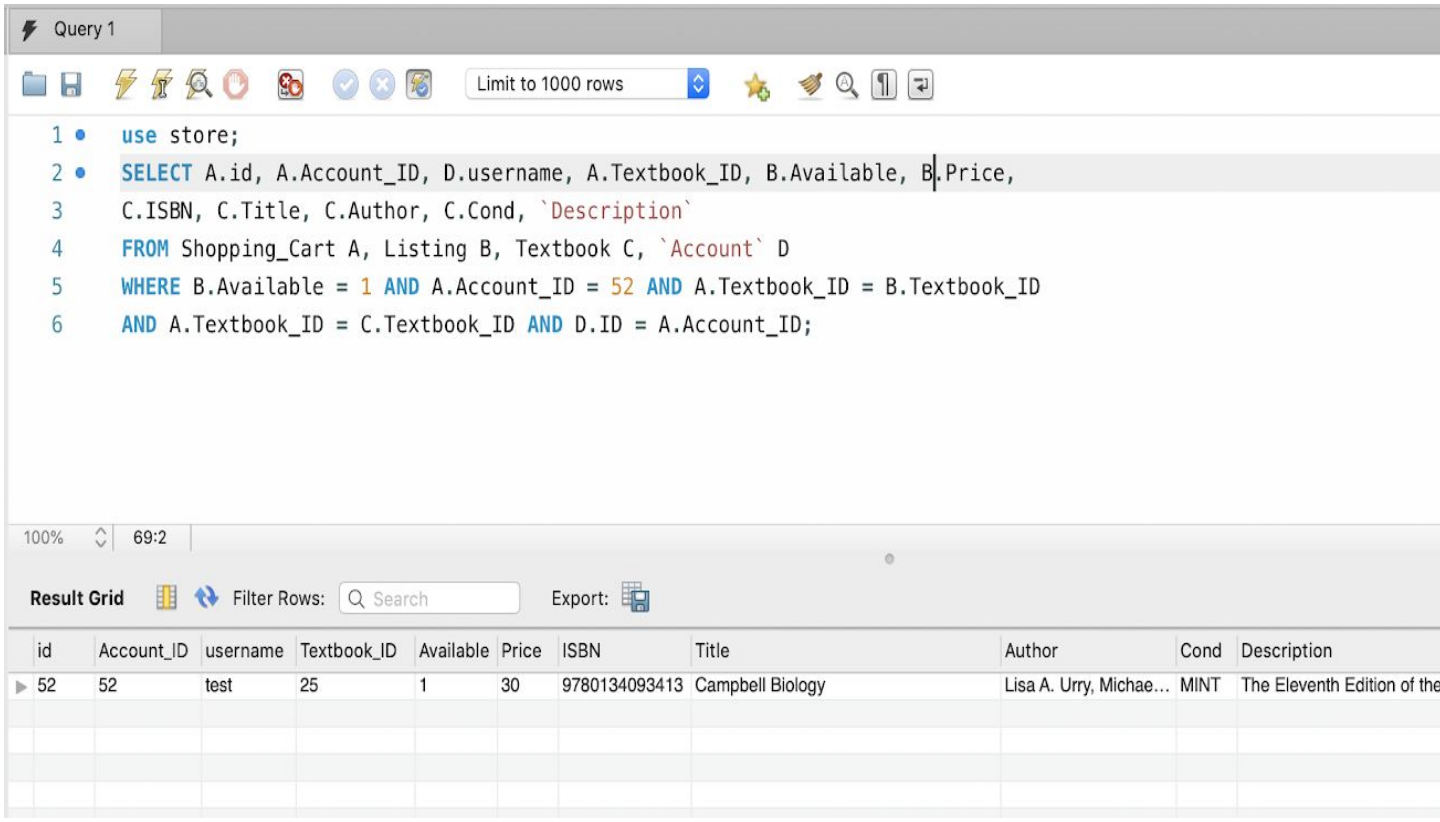
For this feature, I will add one row to the Shopping Cart table.

Now go back to any textbook listing's product page, and clicks on the "Add To Shopping Cart" button to add the item to your shopping cart. After clicking on the button, it will displays "ADDED To Shopping Cart" like below





A simple query to select all rows from Shopping_Cart, the 2nd row in Shopping_Cart represents that I just added textbook_id 25 to account_id 52's shopping cart.



A more complicated query clearly shows the information of account id 52 and textbook id 25.

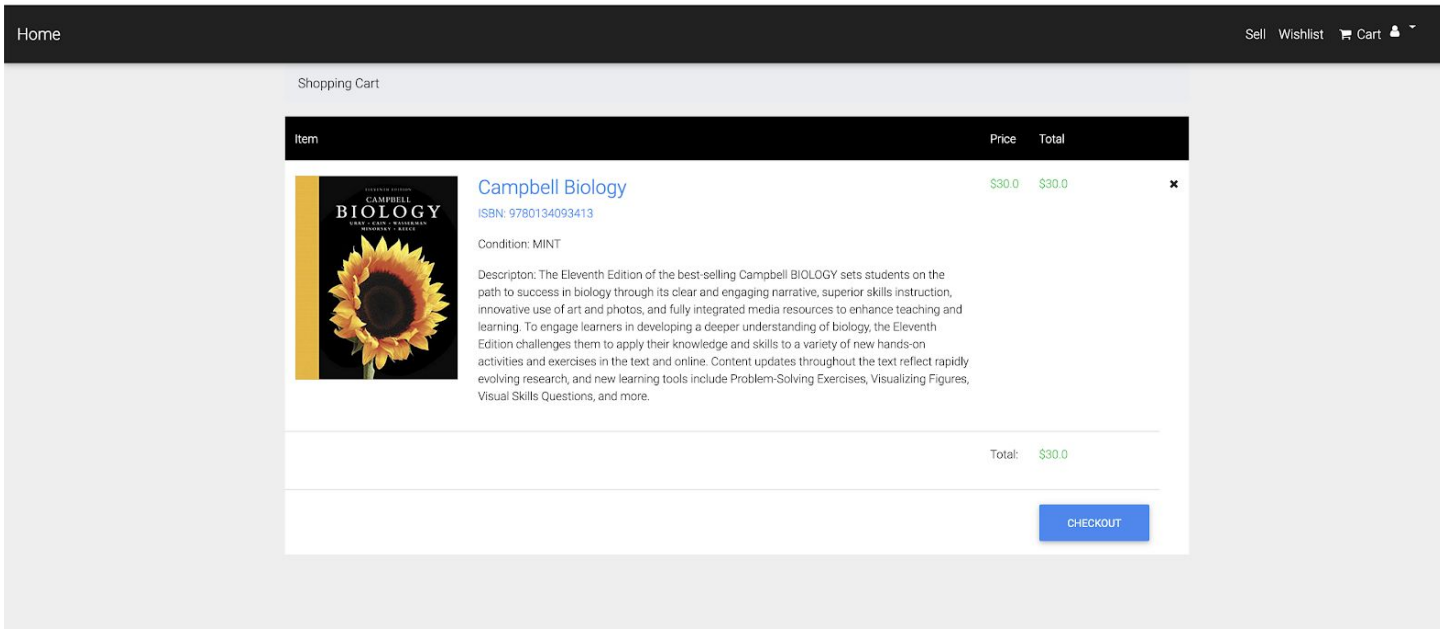
BACKEND LOGIC

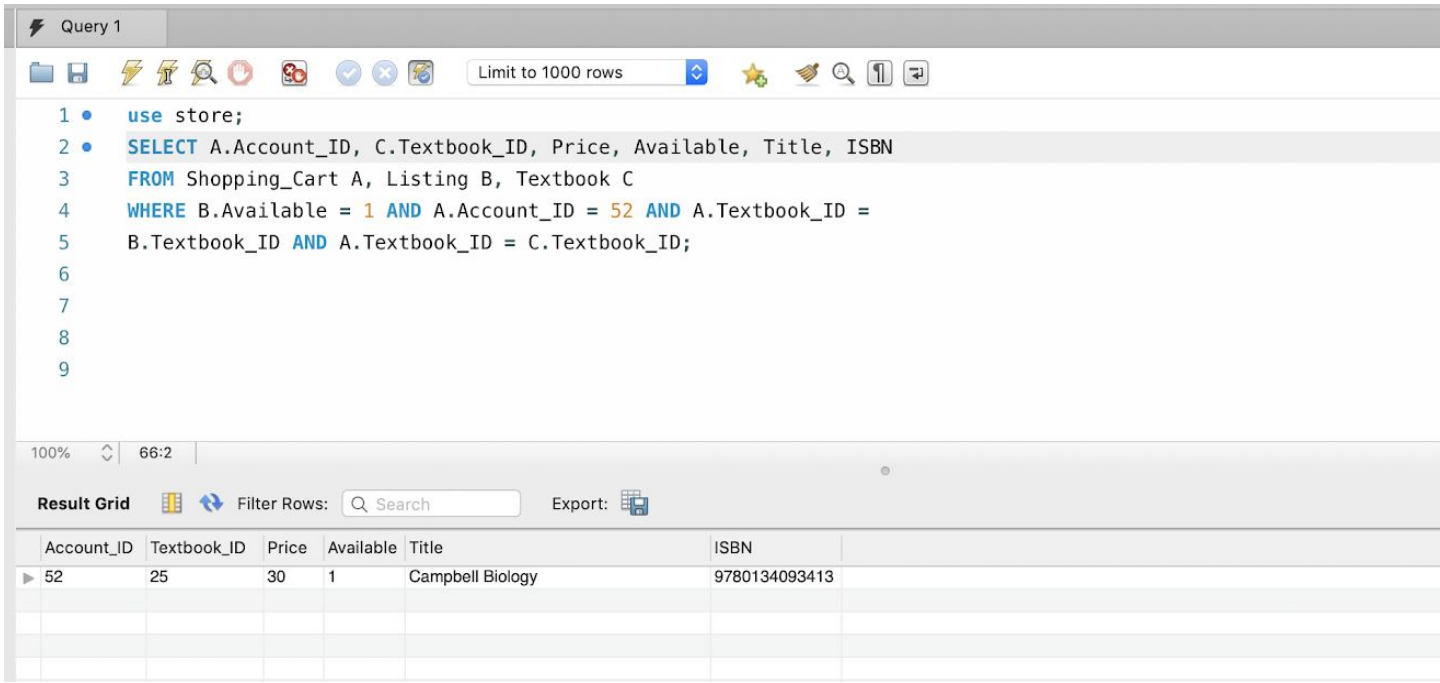

```
cursor.execute("INSERT INTO Shopping_Cart(Textbook_ID, Account_ID) VALUES(%s, %s)",
[textbook_id, str(request.user.id)])
```

To add a new item to the user's shopping cart, just insert a new row in Shopping Cart containing the Account_ID of the user and the Textbook_ID of the textbook. Return an empty JsonResponse because there is nothing significant to return.

VIEW SHOPPING CART

You can now click on the Cart button on the upper right corner to view the items in your shopping cart. After clicking it, it will return to you a view like below:





This is the result of shopping cart query which matches up with what the GUI shown above.

```
@login_required
def view_shopping_cart(request):
    # Select all the items in the user's shopping cart
    shopping_cart_query = """
            SELECT *
            FROM Shopping_Cart A, Listing B, Textbook C
            WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
            AND A.Textbook_ID = C.Textbook_ID
            """
    Cart = Shopping_Cart.objects.raw(shopping_cart_query, [str(request.user.id)])

    # Iterate through the rows and get the total price of all the shopping cart items combined
    total_price = 0;
    for item in Cart:
        total_price += item.Price
    return render(request, "Shopping_Cart.html",context={'Cart': Cart, 'total_price': total_price})
```

```
shopping_cart_query =
"""
    SELECT *
    FROM Shopping_Cart A, Listing B, Textbook C
    WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID =
    B.Textbook_ID AND A.Textbook_ID = C.Textbook_ID
"""
    Cart = Shopping_Cart.objects.raw(shopping_cart_query,
    [str(request.user.id)])
```

The purpose of this query is to select all of the logged in user's items in their shopping cart. I join the Shopping Cart table with the Listing and Textbook table simply to get all of the textbook listing information. They are joined on the condition that Listing.Available = 1 (available for sale), Textbook_ID of Listing, Shopping Cart & Textbook are the same, and that the Account_ID is equal to the logged in user's account id.

The for loop below is iterating through the rows to sum up the price of all the items combined.

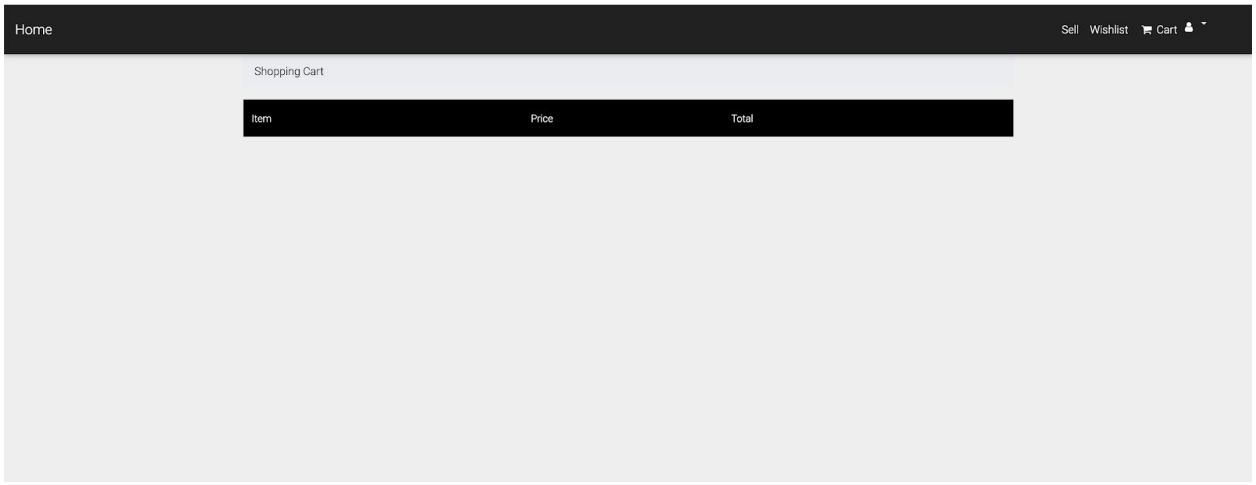
The query result and the total price is then passed into the render function for rendering

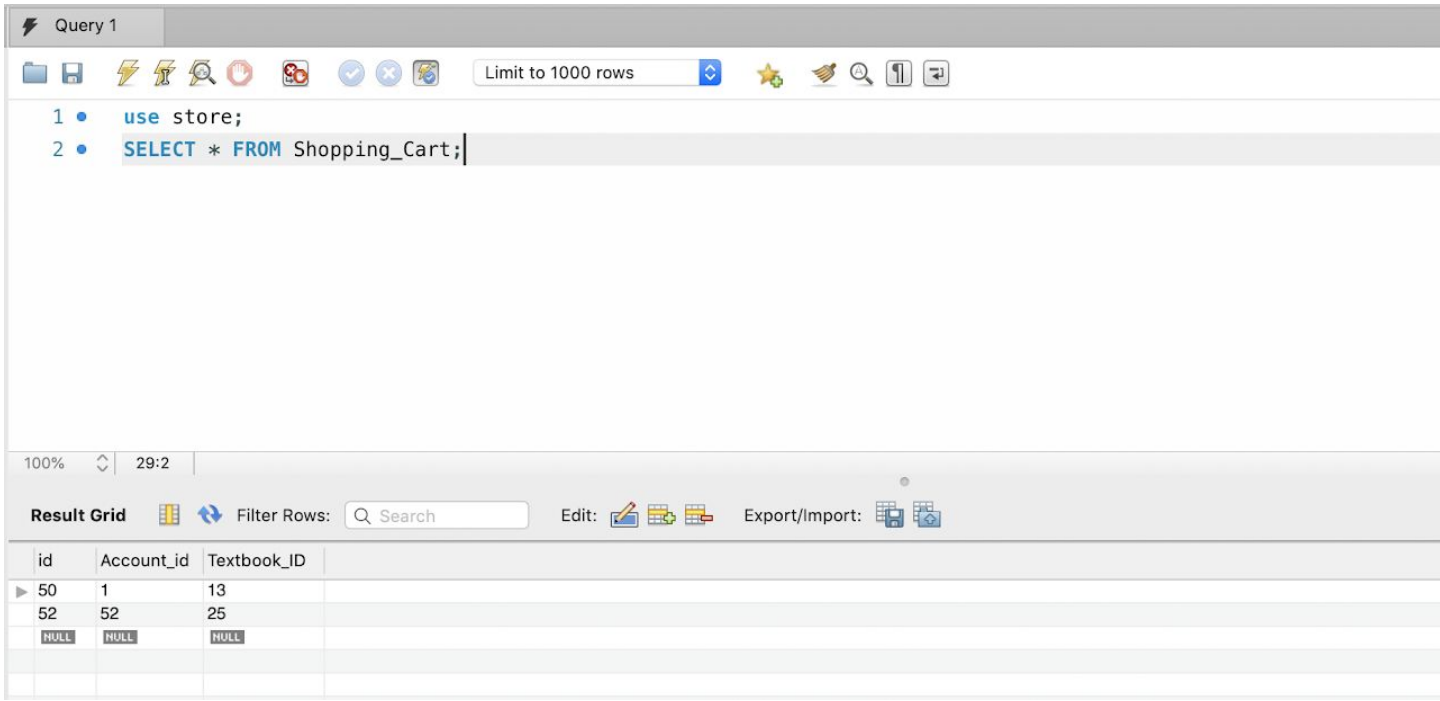
Shopping_Cart.html

REMOVE FROM SHOPPING CART

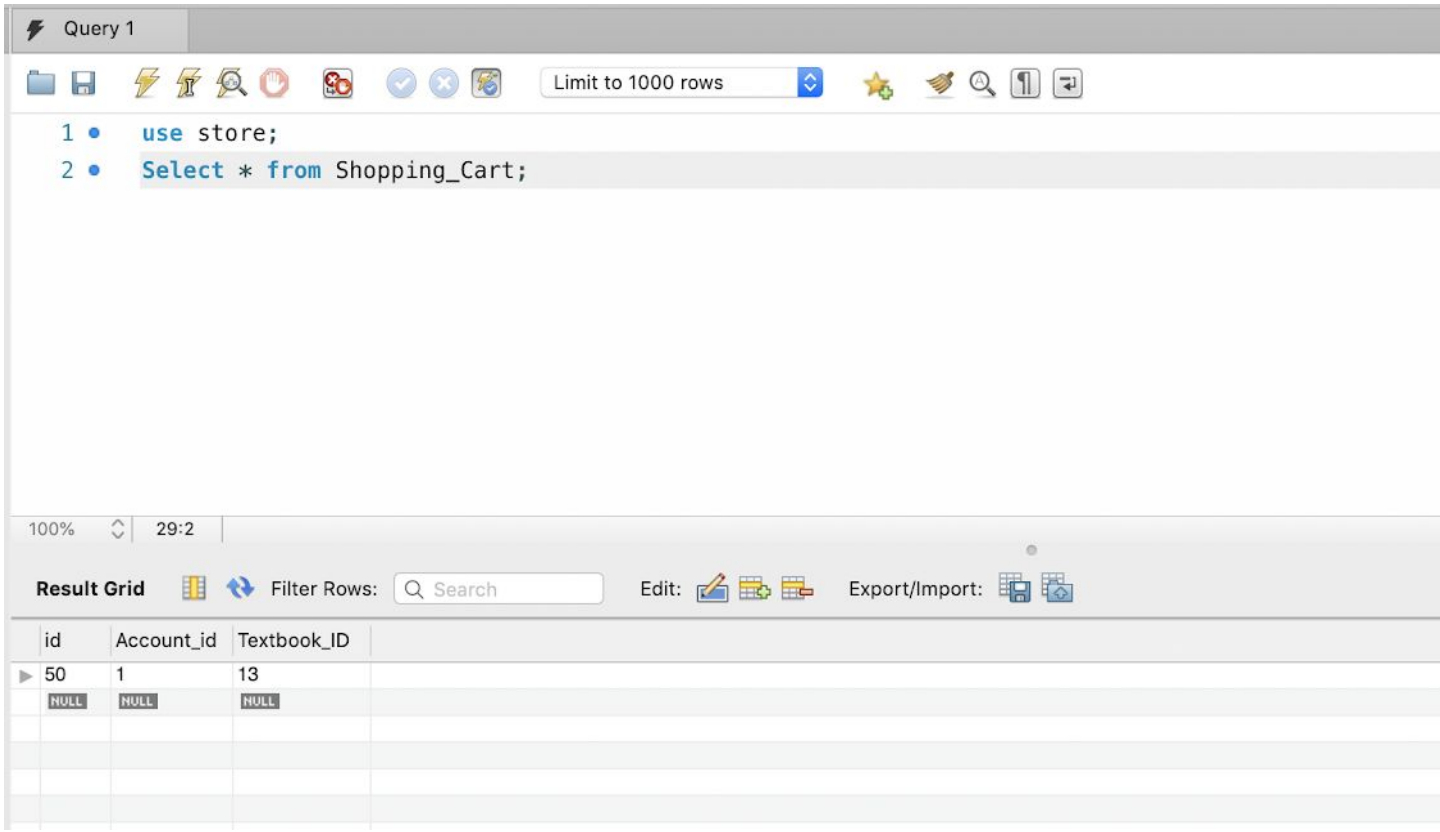
For this feature, I will remove one row from Shopping Cart Table.

Similarly to how you remove an item from Wishlist, each textbook item in your shopping cart has an X icon next to the Total Price column which you can click on to remove the item from your Shopping Cart. Clicks on it and since I only had 1 item in my shopping cart, it will display an empty table like below:





This is from when I query the database after adding the textbook “Campbell Biology” to my shopping cart.



After clicking on the X to remove the item, you can see that the Shopping_Cart row with account_id 52 and tetbook_id 25 has been deleted from the database.

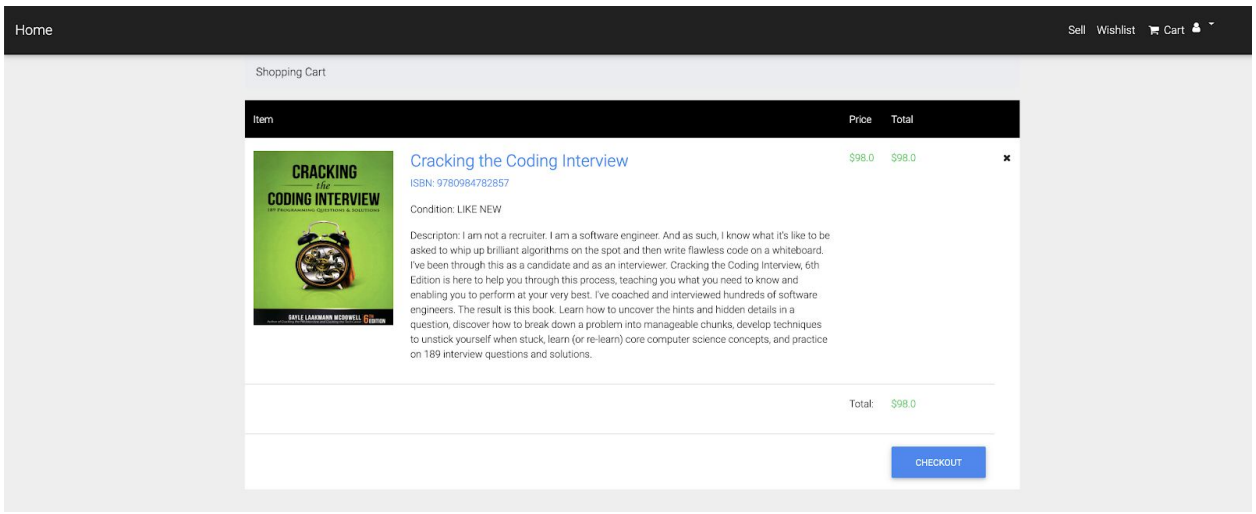
```
@login_required
@csrf_exempt
@require_POST
def shopping_cart_delete(request):

    if request.is_ajax() == True:
        textbook_id = request.POST.get('textbook_id')

        with connection.cursor() as cursor:
                # Delete the item from the user's shopping cart
            cursor.execute("DELETE FROM Shopping_Cart WHERE Account_ID = %s and Textbook_ID = %s", [str(request.user.id), textbook_id])
        connection.close()

        # Query for the remanining items in the user's shopping cart after deleting
        shopping_cart_query = """
        SELECT *
        FROM Shopping_Cart A, Listing B, Textbook C
        WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
        AND A.Textbook_ID = C.Textbook_ID
        """

        Cart = Shopping_Cart.objects.raw(shopping_cart_query, [str(request.user.id)])
        # Find the total price of all the items in the user's shopping cart
        total_price = 0;
        for item in Cart:
            total_price += item.Price
        return render(request, "Cart_Items.html",context={'Cart': Cart, 'total_price': total_price})
```

`cursor.execute("DELETE FROM Shopping_Cart WHERE Account_ID = %s and Textbook_ID = %s", [str(request.user.id), textbook_id])`

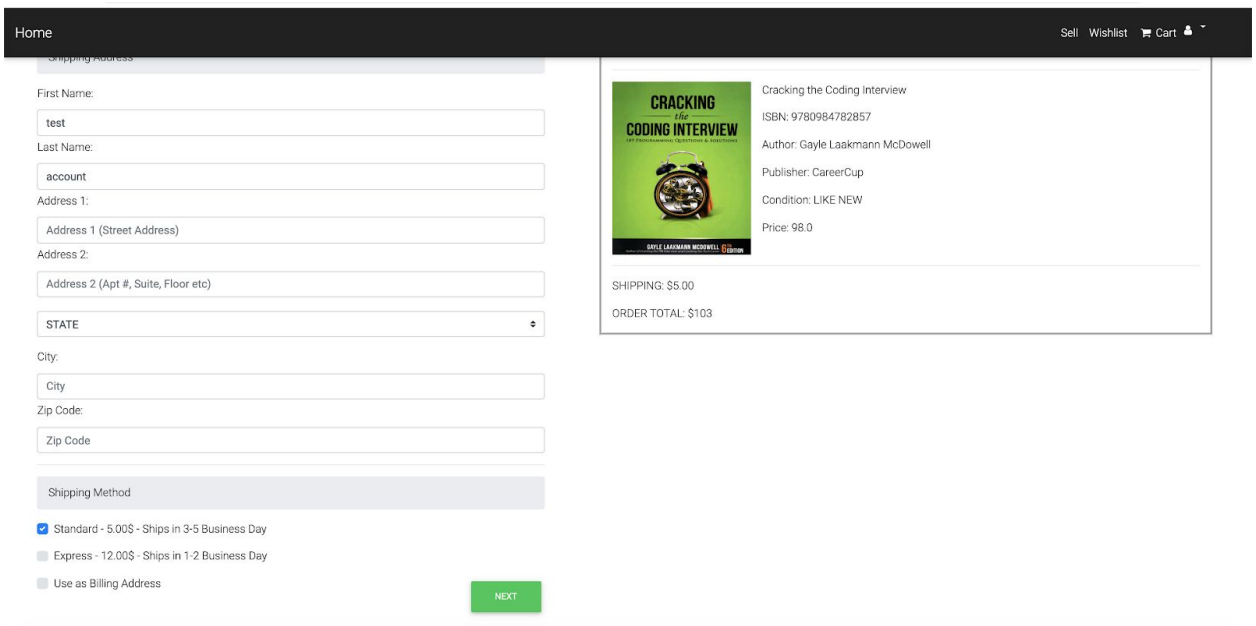
To delete an item from the user's shopping cart, just delete the row where account_id is equals to the user's account id, and textbook_id is equals to the textbook's id.

The shopping cart query and total price calculations on the bottom is the same as the procedure for VIEW SHOPPING CART. I just requery all the items remaining in the shopping cart and calculates the total price so that I can use them to render Cart_Items.html and update the Shopping Cart page without reloading.

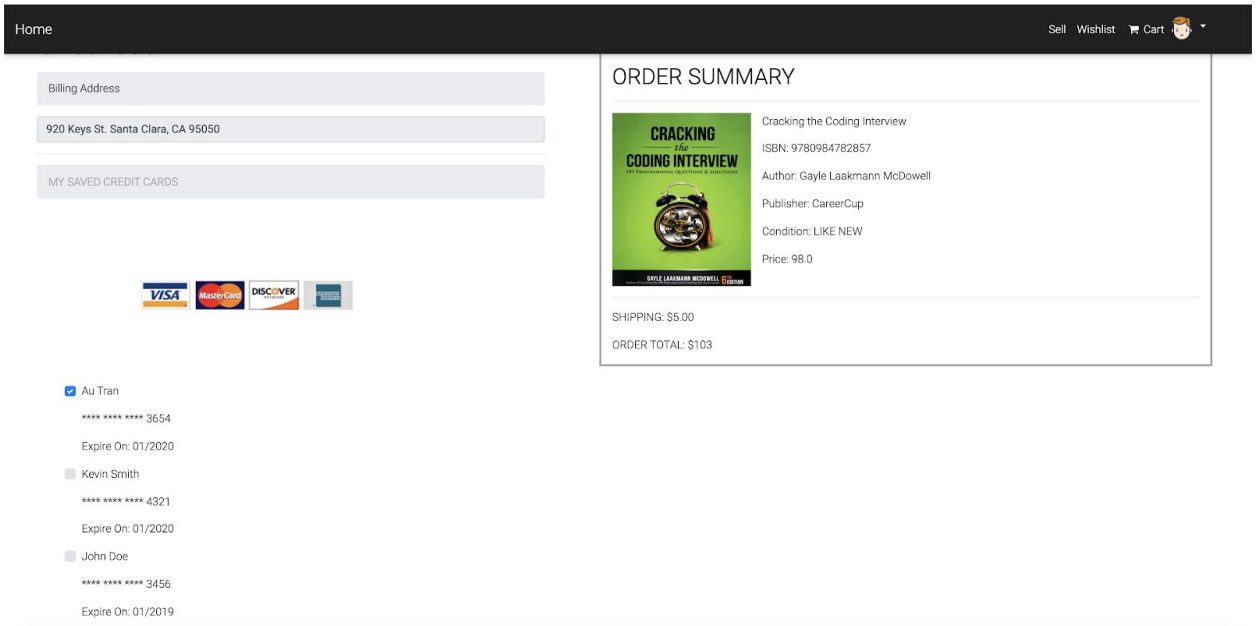
View Checkout



In order to check out your items, head over to the Shopping Cart page and at the bottom right of the table you will see a Checkout button. Click it and it will redirects you to a form for you to input your information and place your order.



This checkout form will be display to you where you can input information about the order on the left and on the right will be a list of textbooks in your order.



On the next step of the form, if you have any credit cards saved to your account then it will be display as a list like on the left as shown above. You can choose any of these credit cards, scroll down, clicks next and move on to your order summary.

Query 1

Limit to 1000 rows

```
1 • use store;
2 • SELECT *
3   FROM PaymentInfo A, Account_Has_PaymentInfo B
4   WHERE A.Card_Number = B.Card_Number AND B.Account_ID = 1;
5
```

100% 58:4

Result Grid Filter Rows: Search Export:

Card_Number	Card_Name	Security_Code	Expiration_Date	Billing_Address	id	Account_id	Card_Number
1092837465654321	Kevin Smith	987	01/2020	2250 Corona Drive Santa Clara, CA 95050	4	1	1092837465654321
1234567890123456	John Doe	123	01/2019	993 River St. Santa Clara, CA 95050	2	1	1234567890123456
9871234561236543	Au Tran	123	01/2020	920 Keys St. Santa Clara, CA 95050	22	1	9871234561236543

This is the query I used to retrieve the credit cards saved to the user's account and list it out for the user to select when checking out an order.

BACKEND:

```
@login_required
def view_checkout(request):
    # Select all textbook listings in the user's shopping cart
    shopping_cart_query = """
            SELECT *
            FROM Shopping_Cart A, Listing B, Textbook C
            WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
            AND A.Textbook_ID = C.Textbook_ID
            """

    # Select all the credit card saved to the user's account
    credit_card_query = """
    SELECT *
    FROM PaymentInfo A, Account_Has_PaymentInfo B
    WHERE A.Card_Number = B.Card_Number AND B.Account_ID = %s
    """
    Credit_Cards = PaymentInfo.objects.raw(credit_card_query, [str(request.user.id)])
    Cart = Shopping_Cart.objects.raw(shopping_cart_query, [str(request.user.id)])
    return render(request, 'Checkout.html', context={"Cart": Cart, 'Credit_Cards': Credit_Cards})
```

```
shopping_cart_query =
"""
SELECT *
FROM Shopping_Cart A, Listing B, Textbook C
WHERE B.Available = 1 AND A.Account_ID = %s AND A.Textbook_ID = B.Textbook_ID
```

```
AND A.Textbook_ID = C.Textbook_ID
"""
```

This query joins Shopping Cart, Listing, and Textbook table together on the condition that Listing.Available = 1 (available for sale), Textbook_ID of Shopping_Cart & Listing & Textbook are the same, and the Account_ID is equals to the logged in user's account id.

The purpose is to select all textbook listings in the user's shopping cart for checkout.

```
credit_card_query =
"""
SELECT *
FROM PaymentInfo A, Account_Has_PaymentInfo B
WHERE A.Card_Number = B.Card_Number AND B.Account_ID = %s
"""
```

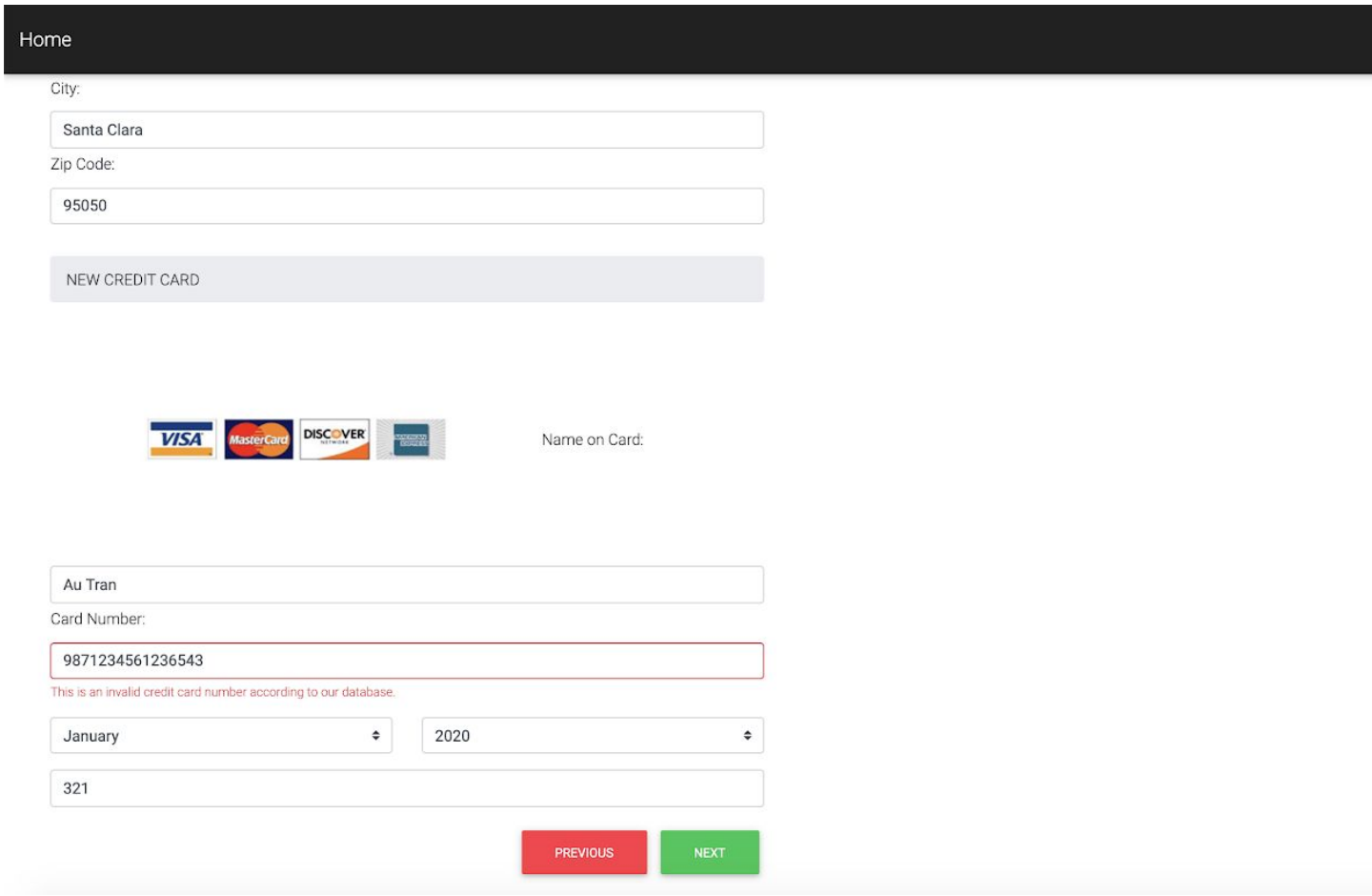
This query joins table PaymentInfo And Account_Has_PaymentInfo on the condition that their Card Number are the same and the Account_ID is equal to the logged in user's account id.

This purpose is to select all the credit cards that is saved to the user's account.

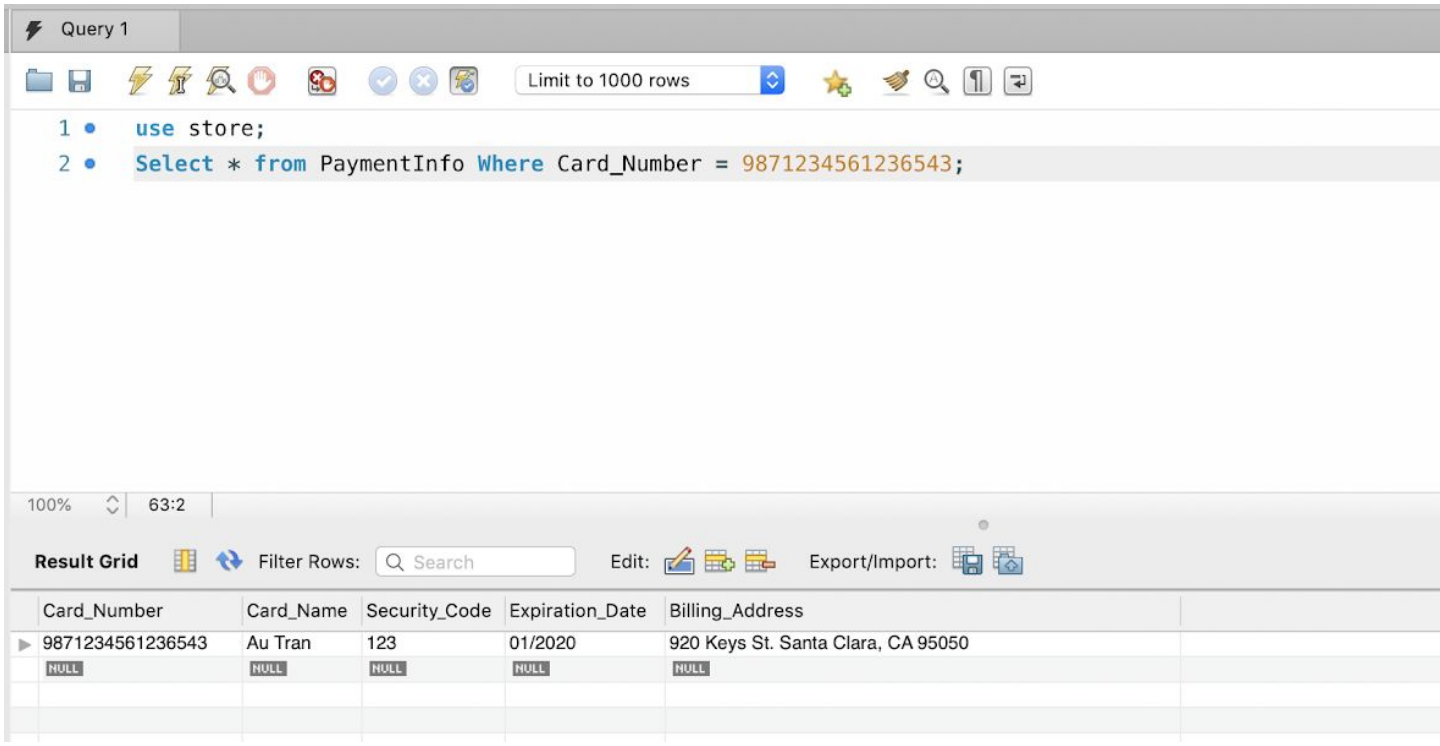
The results of the 2 query is then passed into the render function to render the Checkout.html page that returns a view of the checkout form.

Checking Payment Info

This function is invoked when the user is trying to checkout an order and opts to insert a new credit card information in the database. This function is necessary because my PaymentInfo table contains key Credit Card Number and attributes Credit Card Name, Security Code, Expiration Date, and Billing Address. If the user wants to insert a new credit card using a credit card number that already exists in the database with a different security code for example, then this function will block the request from processing since that breaks the integrity of my database.

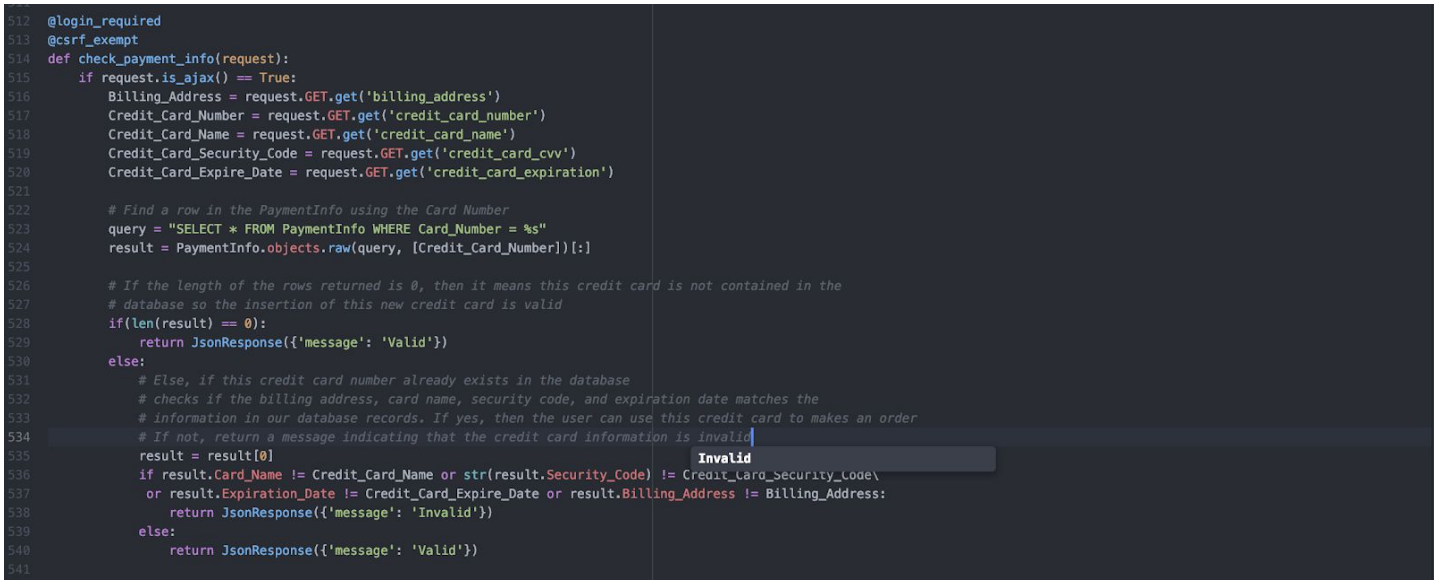


As you can see above, the user is trying to insert a new credit card with Card Number 9871234561236543 and security code 321. However it is invalid since it doesn't match up with what we have in our database.



In our database, there already exists a row in PaymentInfo table with Card_Number = 987123456123654 and the security code is 123 not 321 so it properly marks the credit card the user is trying to use as invalid.

BACKEND LOGIC:



```
@login_required
@csrf_exempt
def check_payment_info(request):
    if request.is_ajax() == True:
        Billing_Address = request.GET.get('billing_address')
        Credit_Card_Number = request.GET.get('credit_card_number')
        Credit_Card_Name = request.GET.get('credit_card_name')
        Credit_Card_Security_Code = request.GET.get('credit_card_cvv')
        Credit_Card_Expire_Date = request.GET.get('credit_card_expiration')

        # Find a row in the PaymentInfo using the Card Number
        query = "SELECT * FROM PaymentInfo WHERE Card_Number = %s"
        result = PaymentInfo.objects.raw(query, [Credit_Card_Number])[:]

        # If the length of the rows returned is 0, then it means this credit card is not contained in the
        # database so the insertion of this new credit card is valid
        if(len(result) == 0):
            return JsonResponse({'message': 'Valid'})
        else:
            # Else, if this credit card number already exists in the database
            # checks if the billing address, card name, security code, and expiration date matches the
            # information in our database records. If yes, then the user can use this credit card to makes an order
            # If not, return a message indicating that the credit card information is invalid
            result = result[0]
            if result.Card_Name != Credit_Card_Name or str(result.Security_Code) != Credit_Card_Security_Code\
             or result.Expiration_Date != Credit_Card_Expire_Date or result.Billing_Address != Billing_Address:
                return JsonResponse({'message': 'Invalid'})
            else:
                return JsonResponse({'message': 'Valid'})
```

First, it will do a query to see if the Credit Card Number already exists in the database.

`query = "SELECT * FROM PaymentInfo WHERE Card_Number = %s"`

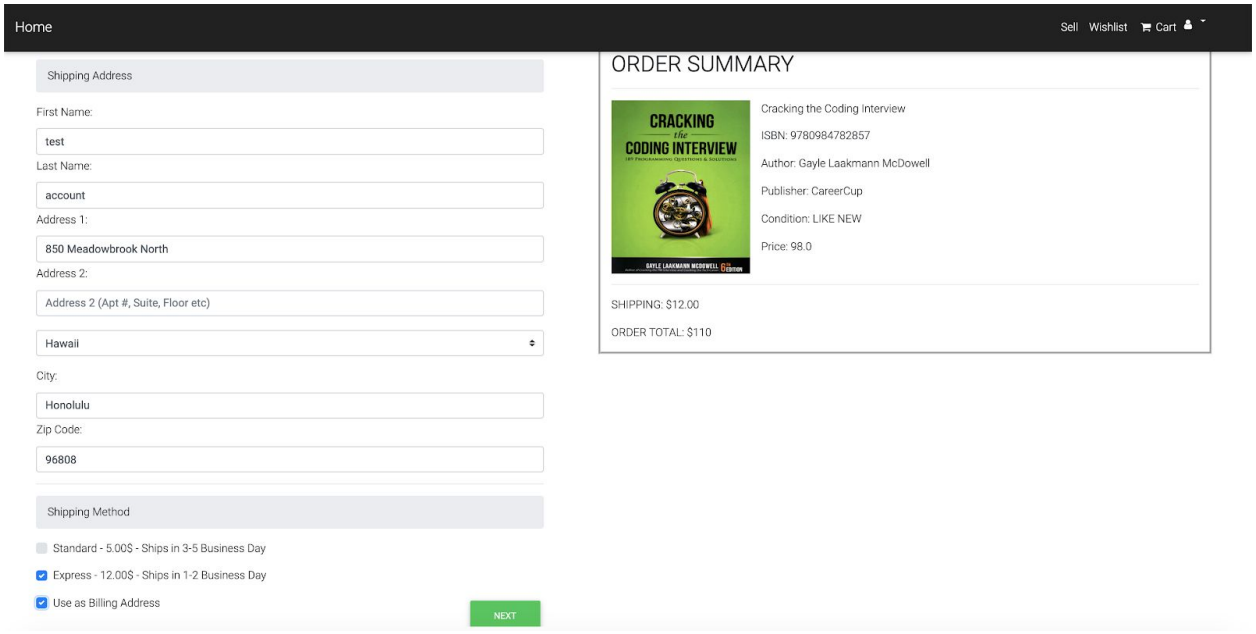
This selects the row in PaymentInfo where Card Number matches the specified number

Then I check len(result) == 0 to see if the length of row returns is 0 then the credit card number is not yet in the database and return a JsonResponse message indicating the credit card information is valid.

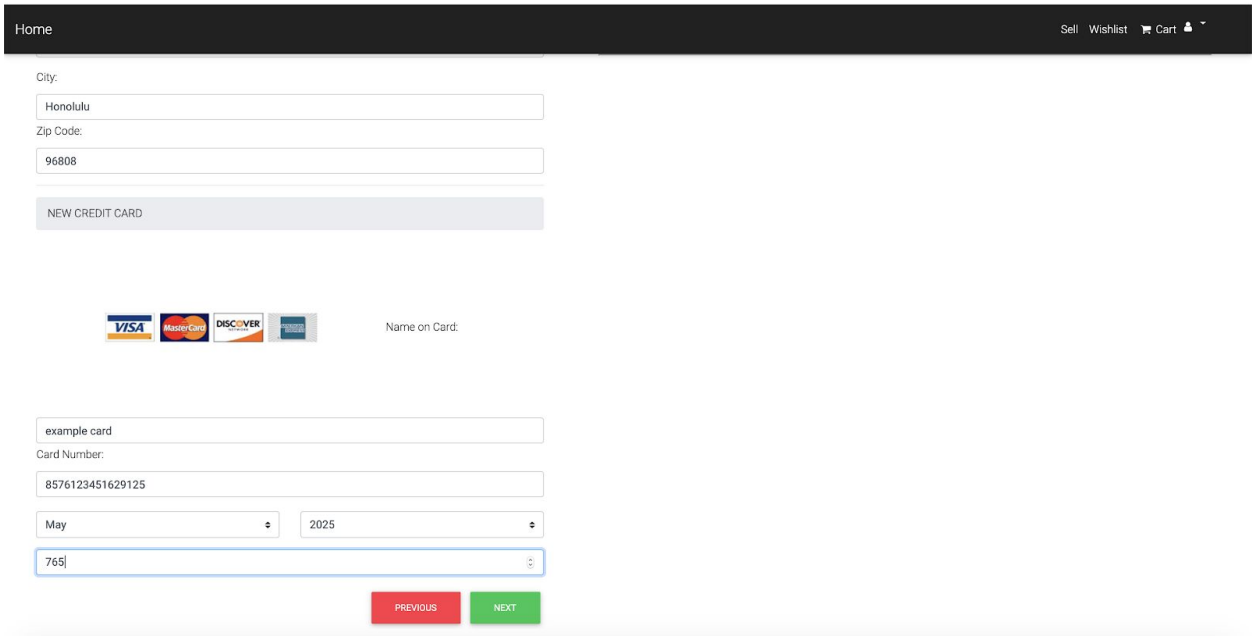
Else, if the credit card number already exists in the database, then I check if the Card Name, Security Code, Expiration Date, and Billing Address matches what is provided by the user. If yes, then it returns a JsonResponse valid message or invalid if not.

CHECKOUT REQUEST

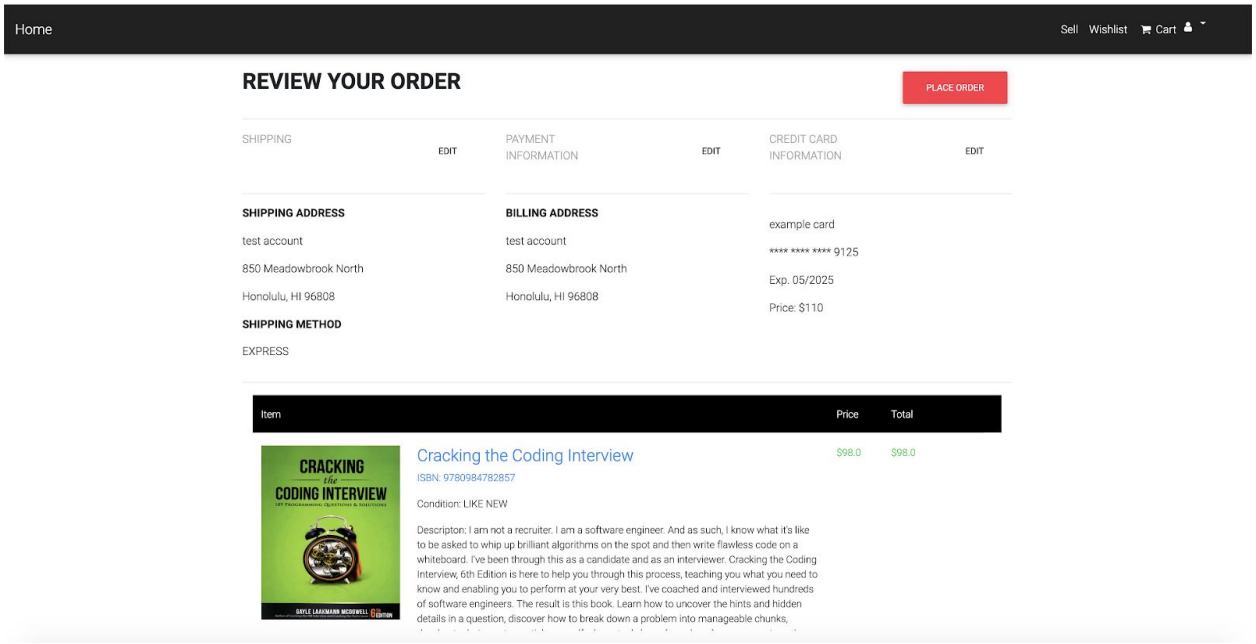
This feature will add a new row to Order table, add a row to Checkout table, add one or more row into Order_Contain_Textbook table. It will use update to update one or more row in Listing and set Available to 0. It also delete one or more rows from both Wishlist and Shopping Carts table. Finally, it may add one rows to both PaymentInfo and Account_Has_PaymentInfo table.



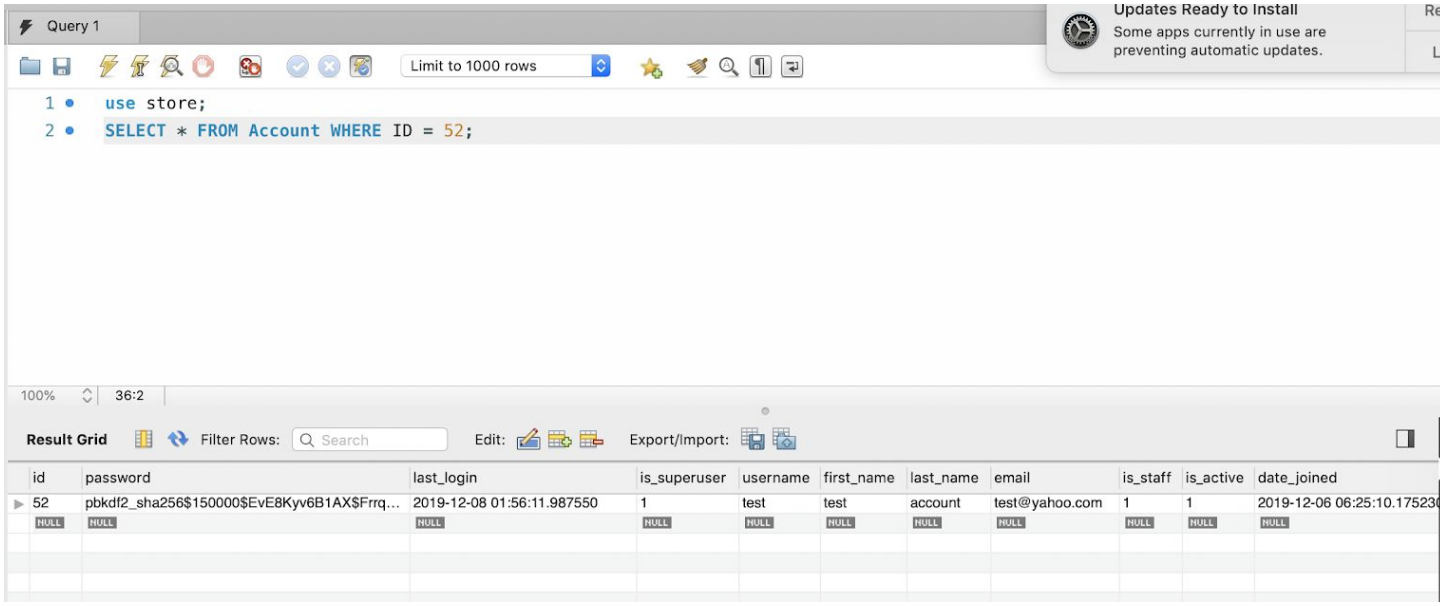
Go to checkout and fill in the shipping address and click Next



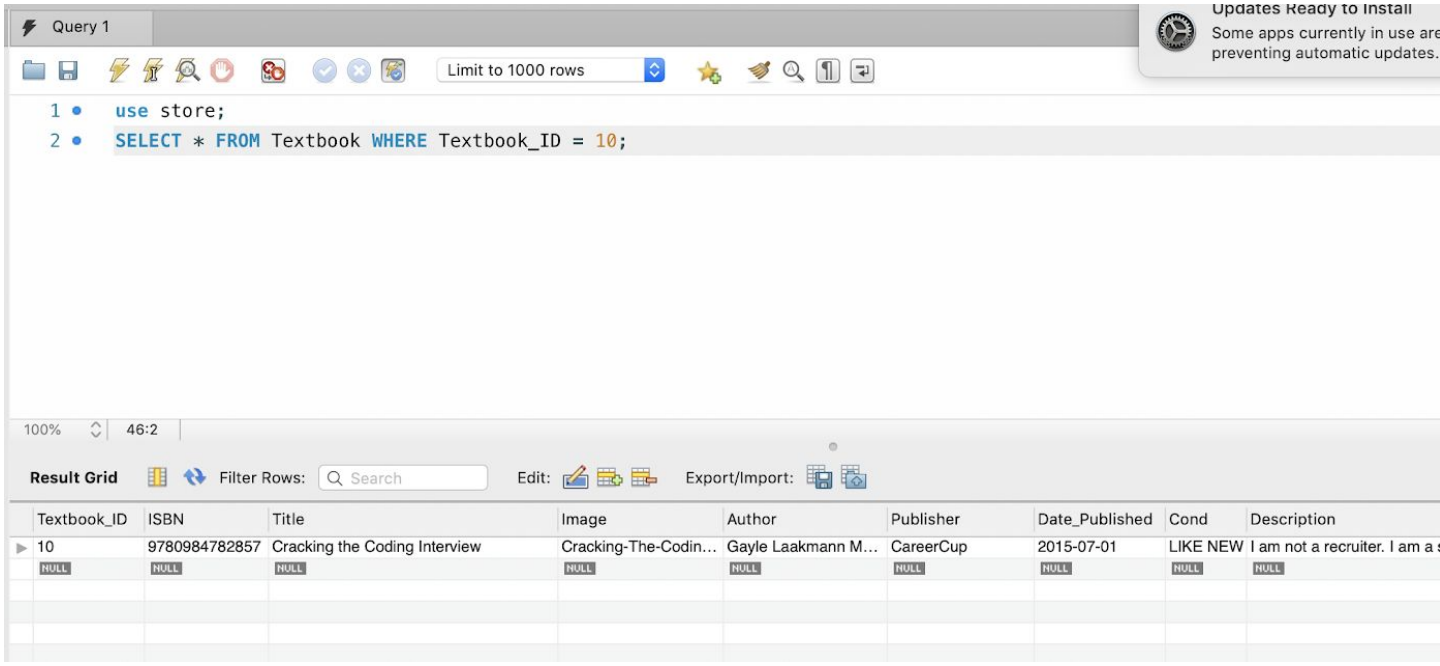
Fill in your billing address and new credit information and click Next



If you are happy with your order information, click the red Place Order or the top or bottom of the page to place your order.

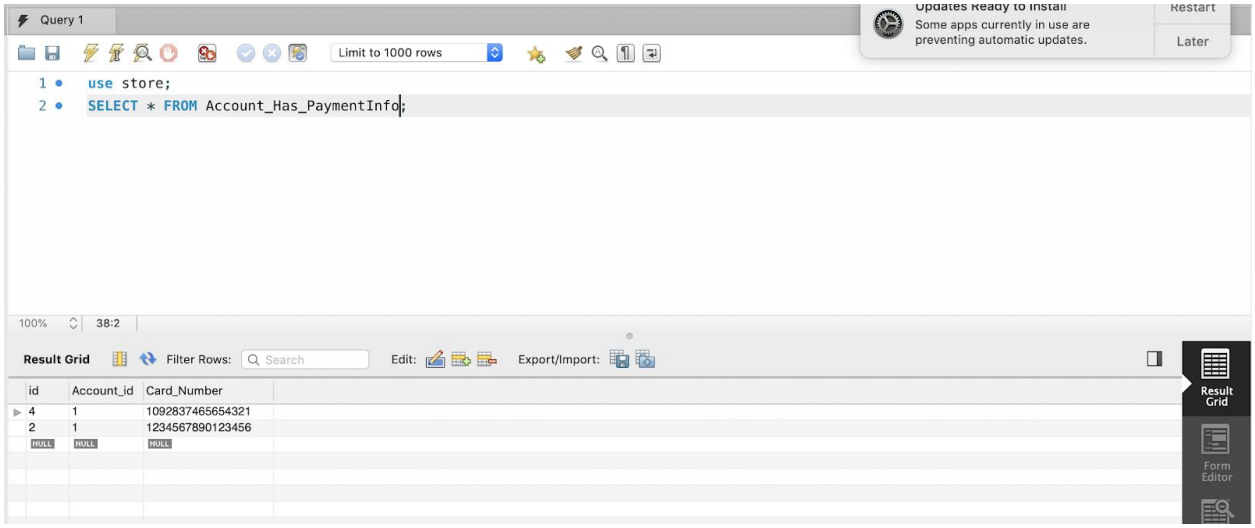


This is account with id 52, the account that I will be using to checkout this order

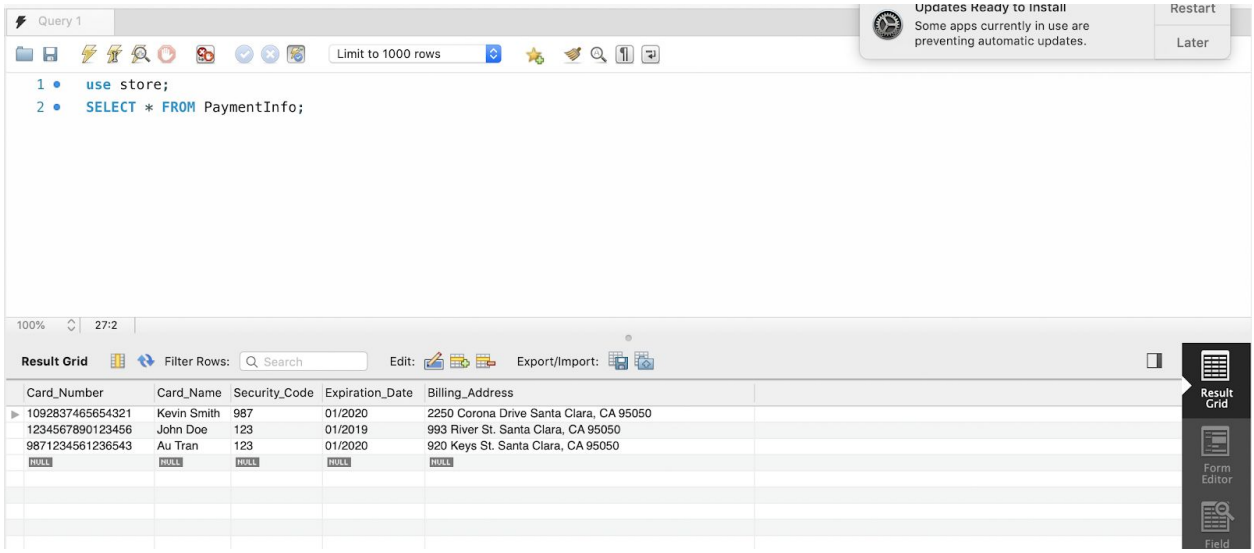


This is textbook id 10, the textbook that I will buy in this order

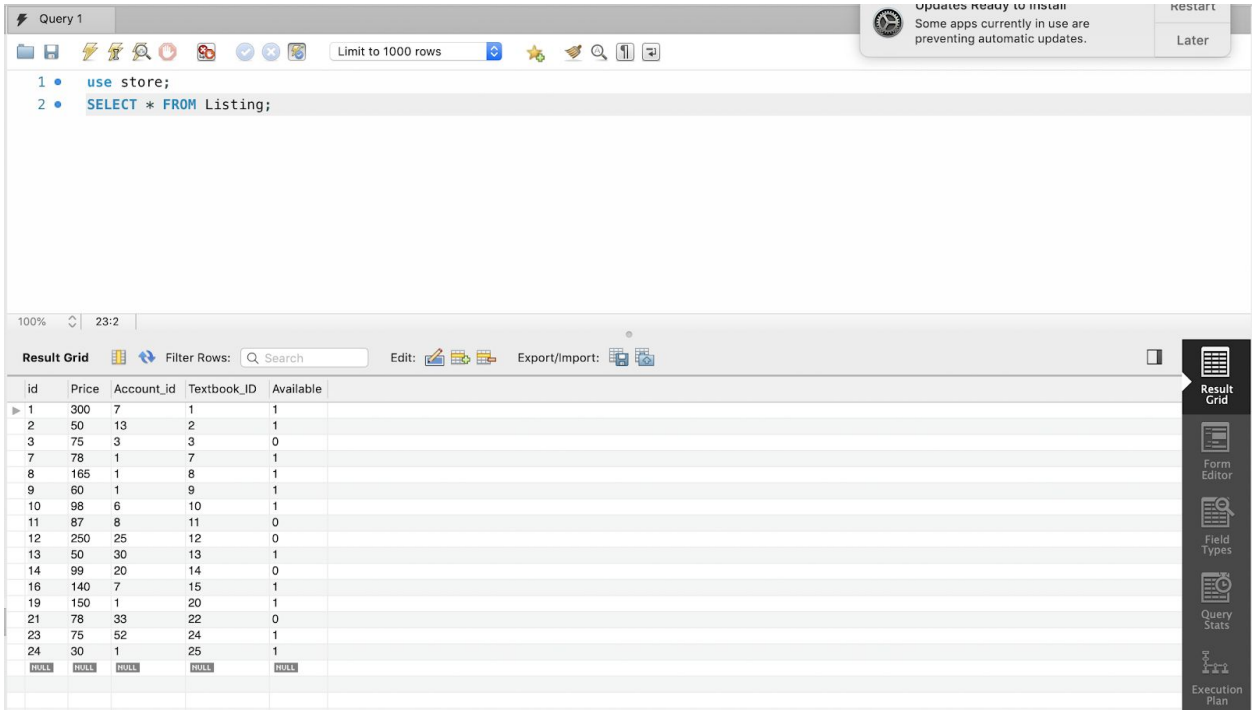
STATE OF THE DATABASE PRECHECKOUT:



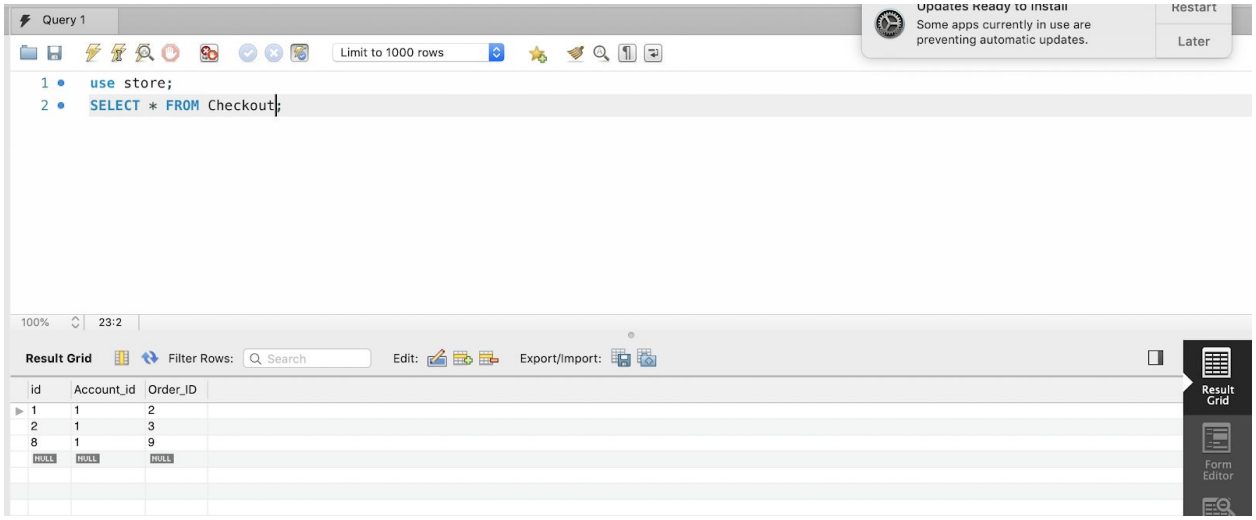
You can see here that Account_Has_PaymentInfo precheckout has no row associated with account_id 52 indicating that there is no saved credit cards for that account yet



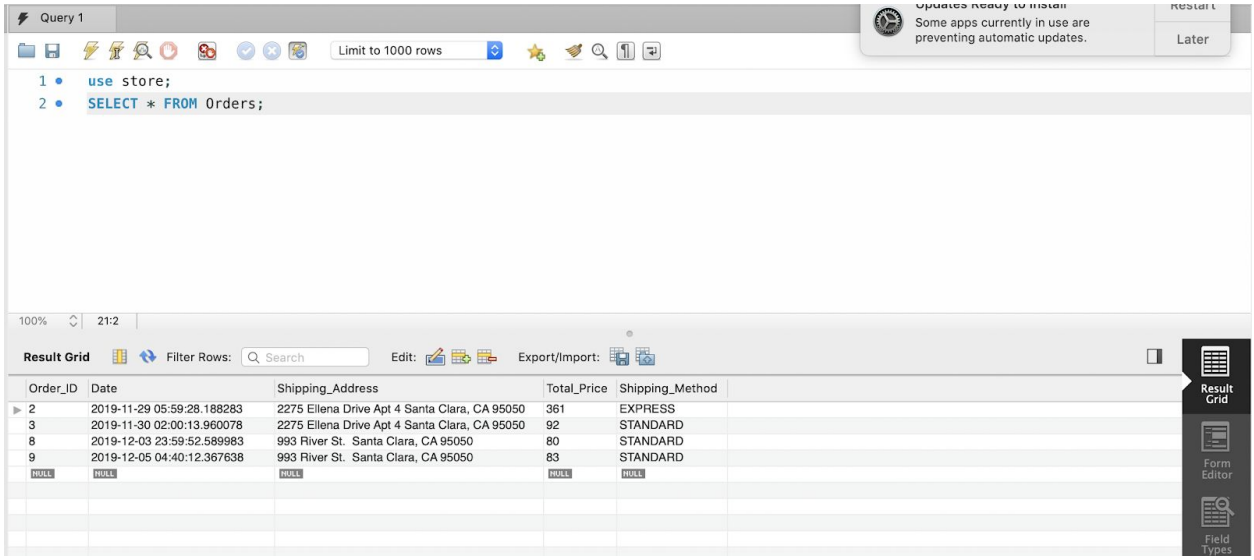
This is the list of credit cards existing in the PaymentInfo table precheckout



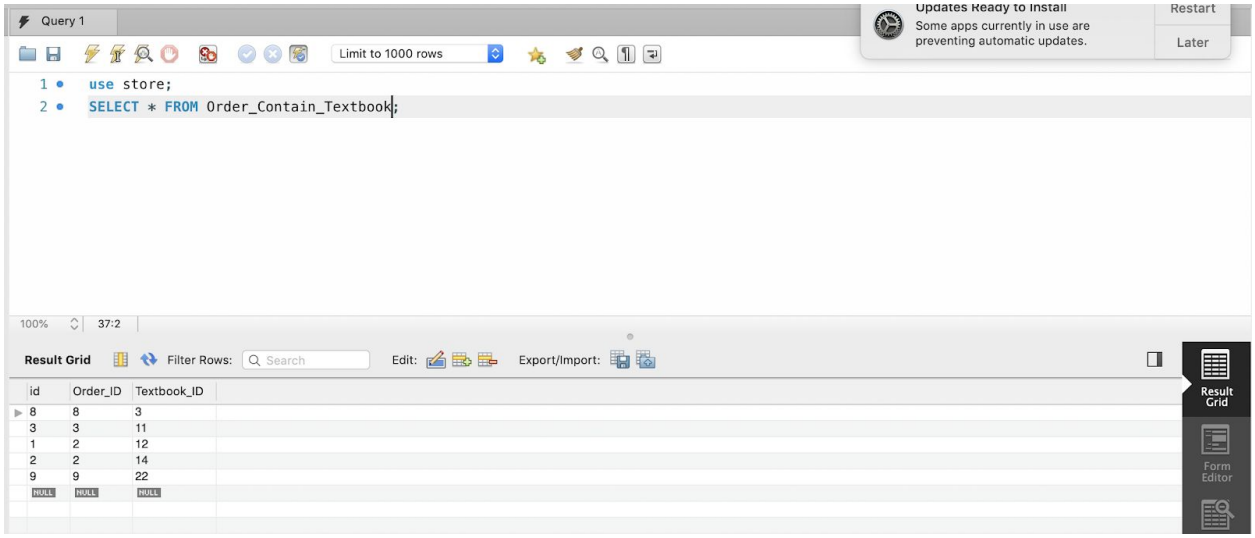
The rows in Listing table represents all of the Textbook listings. Notice that the textbook we are about to checkout (textbook_id 10) is in row 10 of the Listing table and Available is set to 1 (indicating it is available for sale).



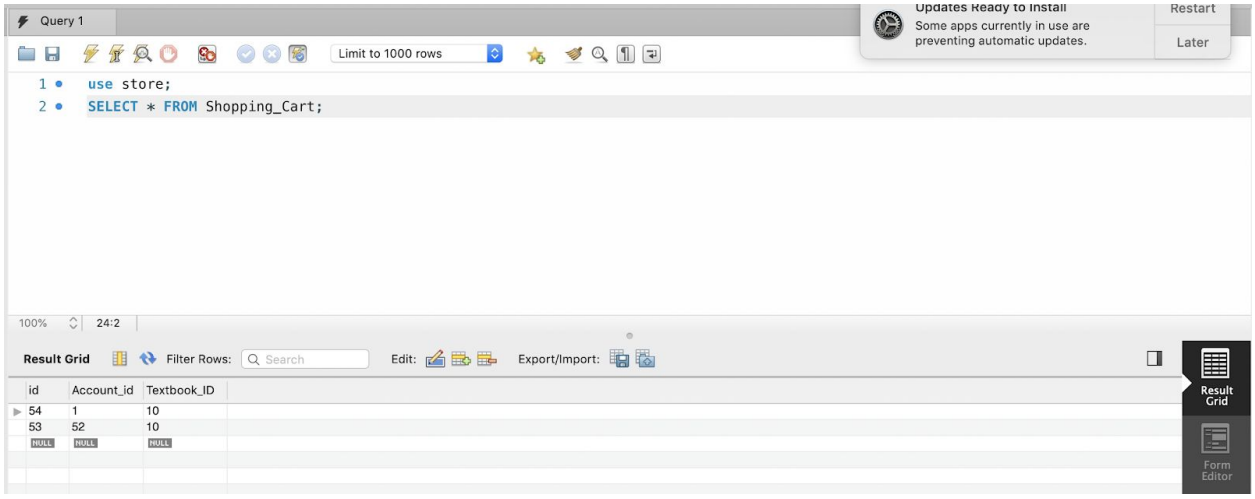
This is the number of checkouts existing in Checkout table. There is no row associated with account id 52 indicating that that account has not made any checkout yet



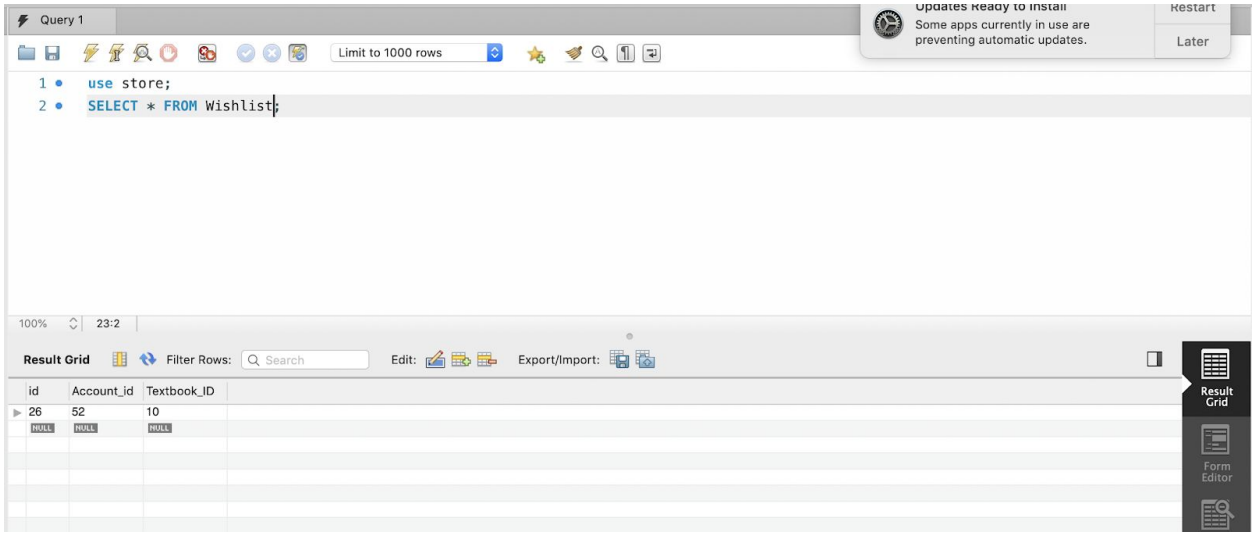
This is the number of orders existing in the Orders table before I place my order



This is the rows in Order_Contain_Textbook that shows which textbook was sold in which order.

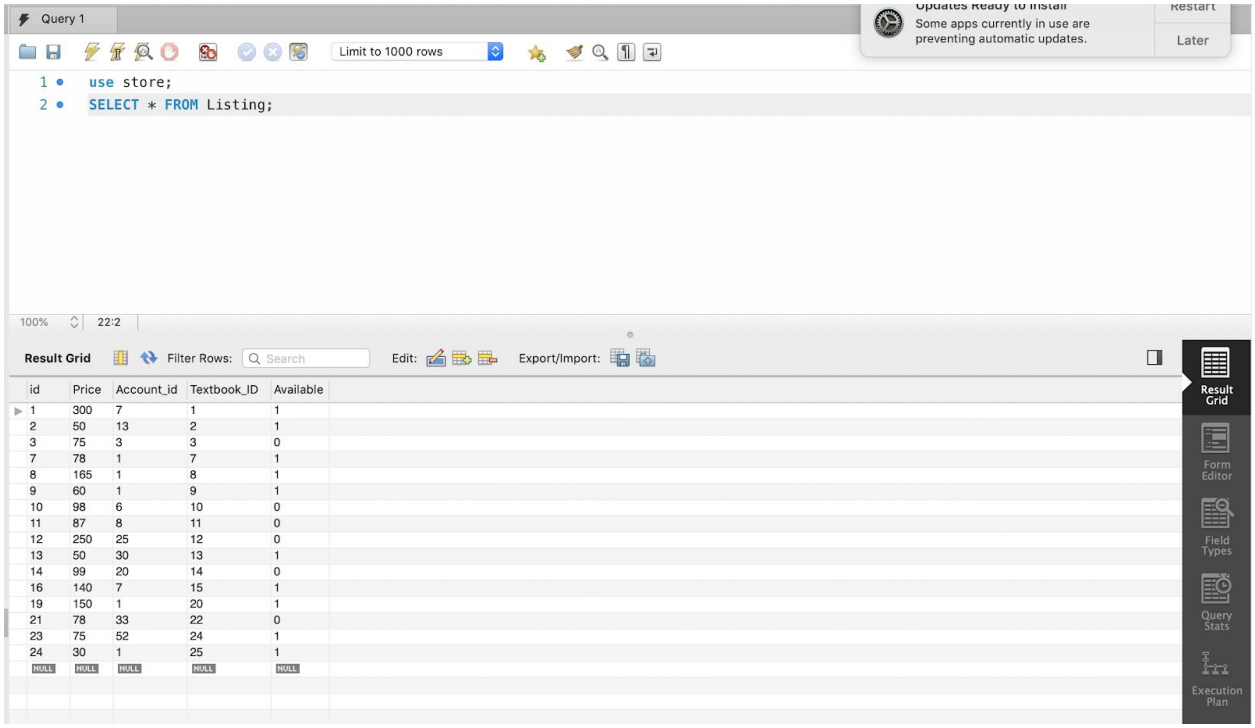


This is the rows in Shopping Cart representing the textbooks in each account's shopping cart. As you can see the textbook I'm about to checkout (id 10) is in the shopping cart of two accounts.

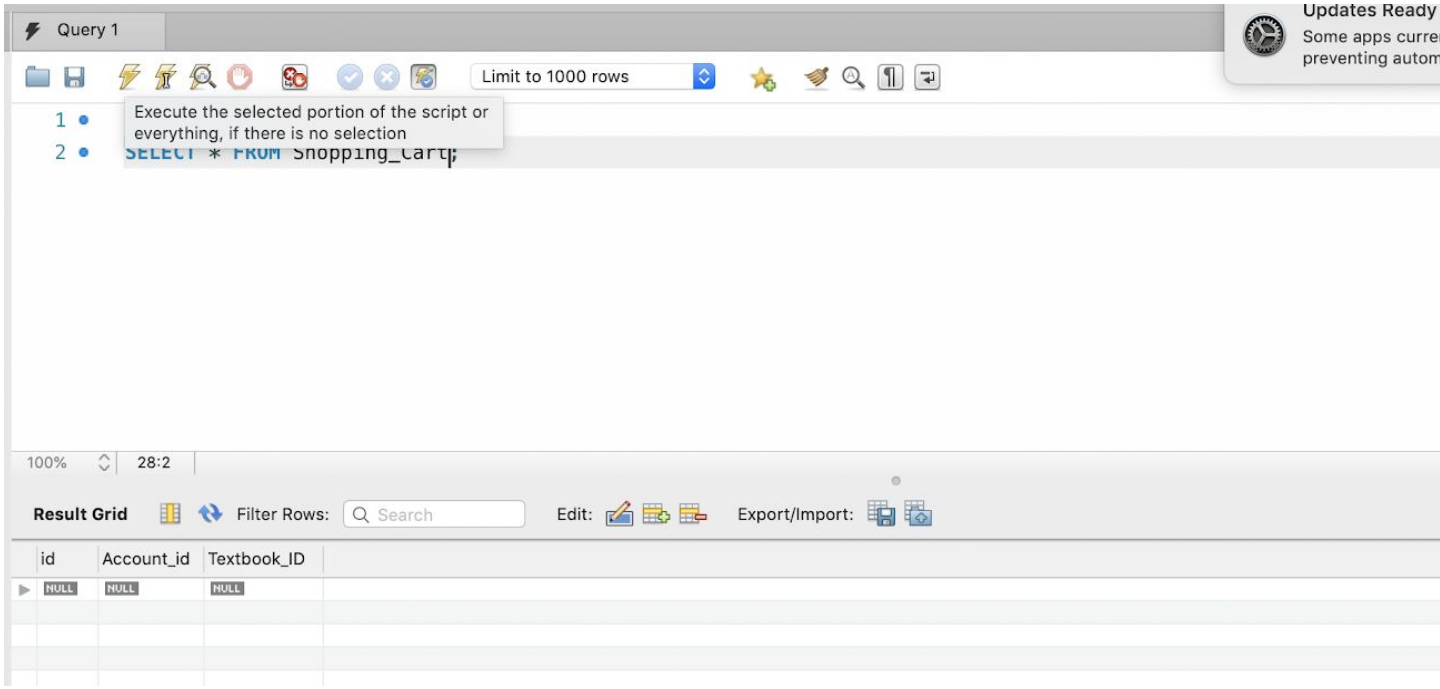


This is the rows in Wishlist table representing the textbooks in each account's wish list. As you can see the textbook I'm about to checkout (id 10) is in the wish list of account_id 52

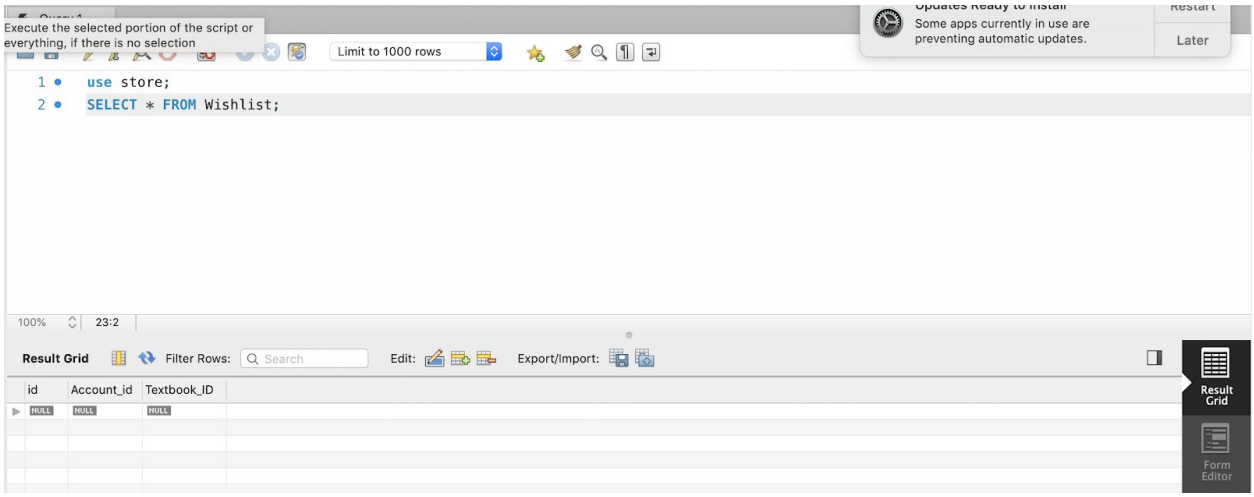
STATE OF THE DATABASE POSTCHECKOUT



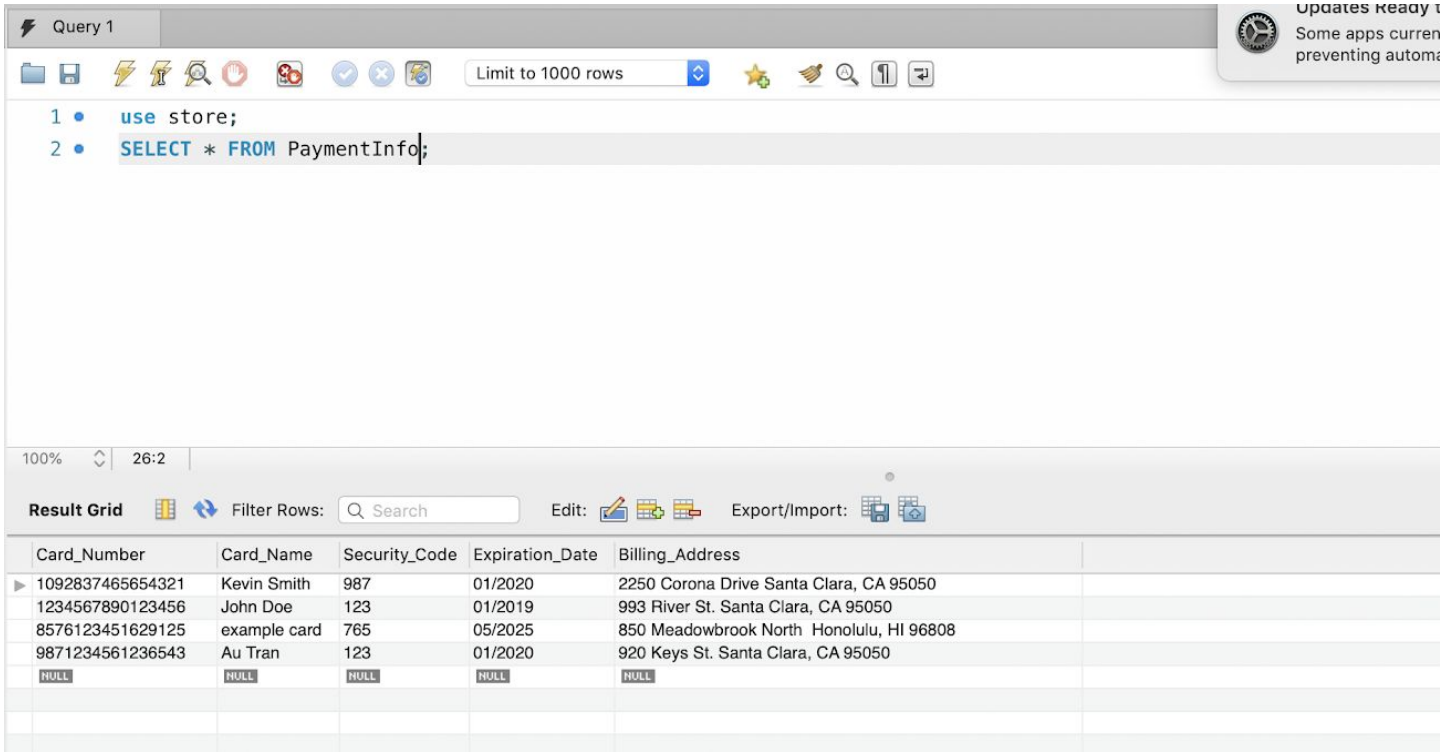
Notice in row 10 of the Listing table, after placing an order on the textbook with id 10, the row is update with Available = 0 indicating that the textbook is sold and no longer available for sale.



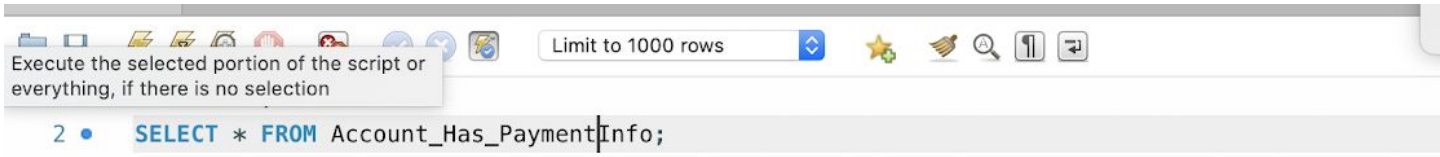
There exists no remaining row in Shopping Cart table because after buying the textbook the textbook is then removed from every account's shopping cart so the corresponding rows are deleted from the database.

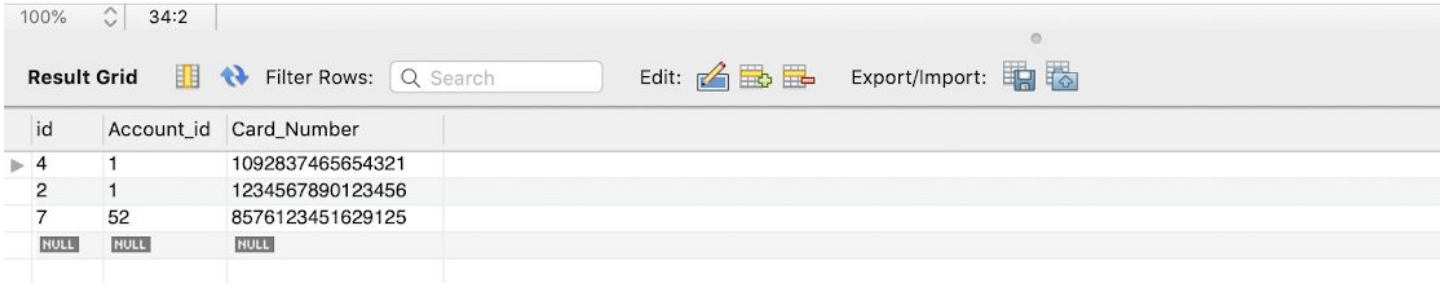


There exists no remaining row in Wishlist table because after buying the textbook the textbook is then removed from every account's wishlist so the corresponding rows are deleted from the database.



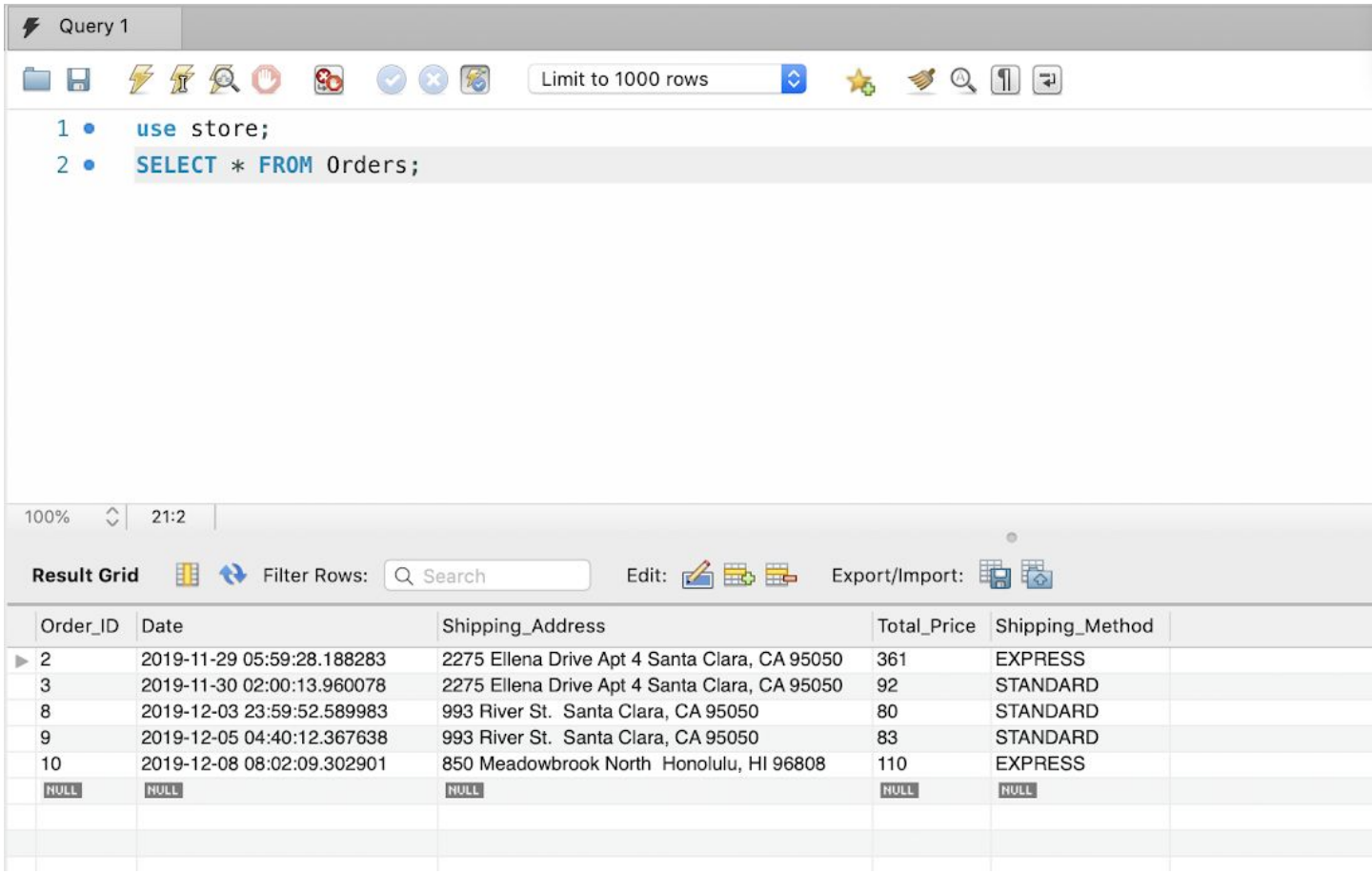
After placing the order, the new credit card information is inserted into PaymentInfo table. The row inserted is row 3.





id	Account_id	Card_Number
4	1	1092837465654321
2	1	1234567890123456
7	52	8576123451629125
NULL	NULL	NULL

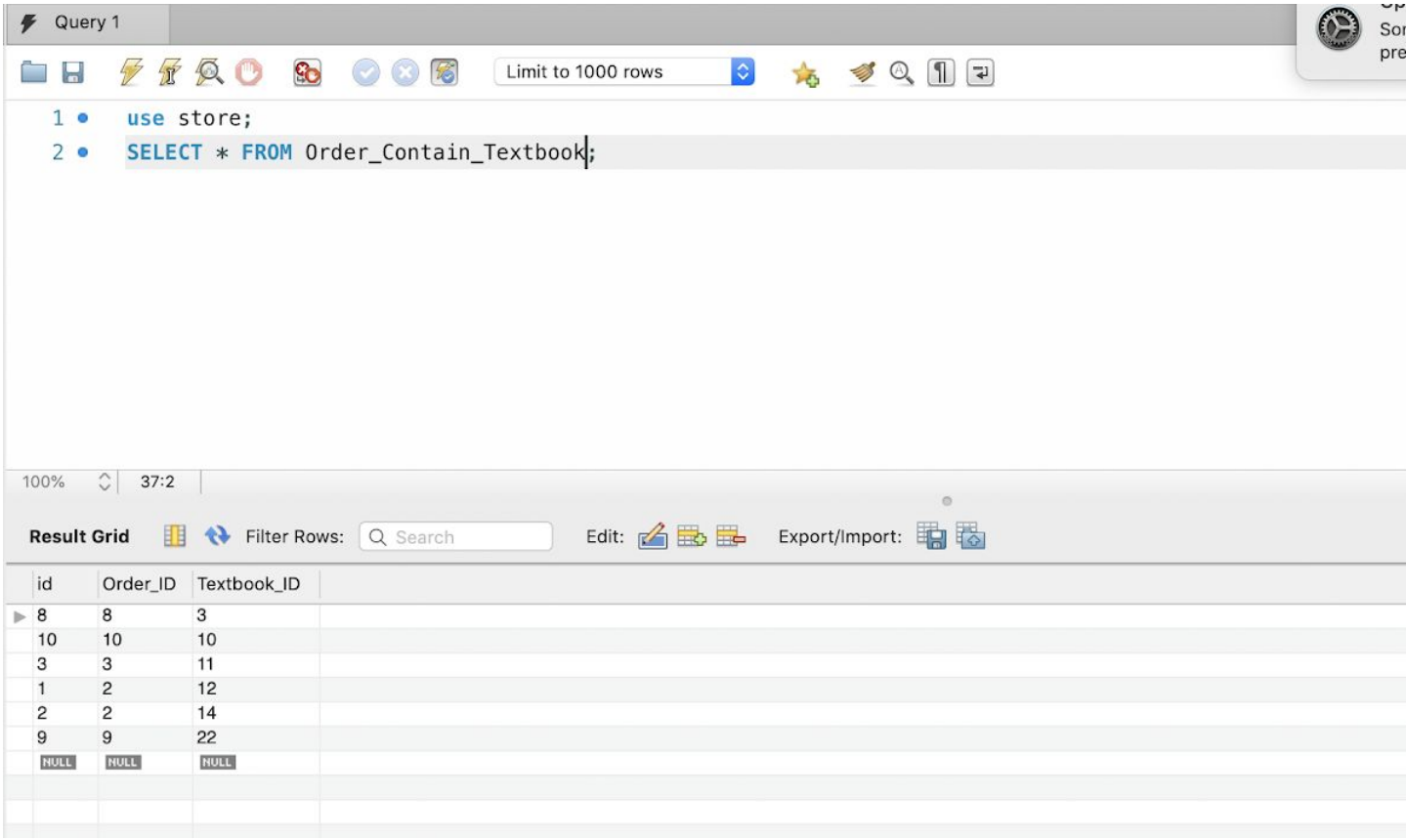
A new row in Account_Has_PaymentInfo table is inserted with account_id = 52 and Card_Number of the credit card we just inserted. This represents that the new credit card is now saved to the user's account.



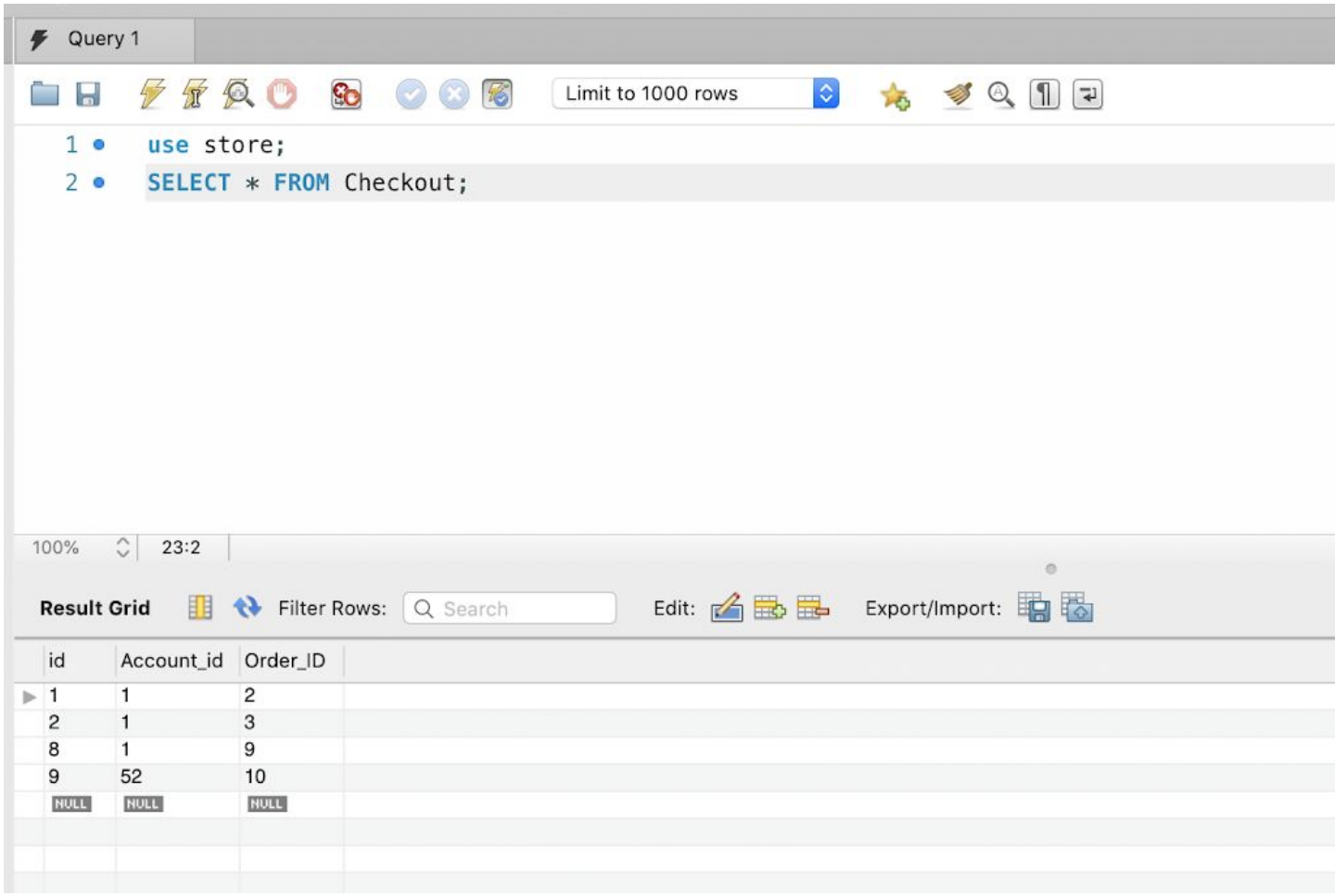
Order_ID	Date	Shipping_Address	Total_Price	Shipping_Method
2	2019-11-29 05:59:28.188283	2275 Ellena Drive Apt 4 Santa Clara, CA 95050	361	EXPRESS
3	2019-11-30 02:00:13.960078	2275 Ellena Drive Apt 4 Santa Clara, CA 95050	92	STANDARD
8	2019-12-03 23:59:52.589983	993 River St. Santa Clara, CA 95050	80	STANDARD
9	2019-12-05 04:40:12.367638	993 River St. Santa Clara, CA 95050	83	STANDARD
10	2019-12-08 08:02:09.302901	850 Meadowbrook North Honolulu, HI 96808	110	EXPRESS
NULL	NULL	NULL	NULL	NULL

A new row is inserted into Orders table of Order_ID 10 and containing the Date,

Shipping_Address, Total_Price, Shipping_Method of the order we just placed.



In the 2nd row of Order_Contain_Textbook, that is the new row just inserted containing Order_ID 10 and Textbook_ID 10 representing that the order we just placed contain the textbook with id 10.



In the 4th row with id 9 of table Checkout, this new row was inserted with Account_id 52 and Order_ID 10 indicating that the account with id 52 just checkout the order with id 10.

BACKEND LOGIC

```python
@login_required
@require_POST
@csrf_exempt
def checkout_request(request):
    if request.is_ajax() == True:
        Textbooks = json.loads(request.POST.get('textbooks'))
        Shipping_Address = request.POST.get('shipping_address')
        Shipping_Method = request.POST.get('Shipping_Method')
        Billing_Address = request.POST.get('billing_address')
        Total_Price = request.POST.get('order_total_price')
        Credit_Card_Number = request.POST.get('credit_card_number')
        Credit_Card_Name = request.POST.get('credit_card_name')
        Credit_Card_Security_Code = request.POST.get('credit_card_cvv')
        Credit_Card_Expire_Date = request.POST.get('credit_card_expiration')
        Present_Time = datetime.now()

        with connection.cursor() as cursor:
            # Query to see if there is any credit card with this credit card number in the database
            payment_info_query = "SELECT * FROM PaymentInfo WHERE Card_Number = %s"
            Credit_Card = PaymentInfo.objects.raw(payment_info_query, [Credit_Card_Number])[:]

            # If this credit card number doesn't exist in the database, insert a new row
            # into PaymentInfo table representing a new credit card
            if len(Credit_Card) == 0:
                insert_payment_info_query = """
                INSERT INTO PaymentInfo(Card_Number, Card_Name, Security_Code, Expiration_Date, Billing_Address)
                VALUES(%s, %s, %s, %s, %s)
                """
                cursor.execute(insert_payment_info_query, [Credit_Card_Number, Credit_Card_Name, Credit_Card_Security_Code, Credit_Card_Expire_Date, Billing_Address])

            # Query to see if this credit card is already saved to the user's account
            account_has_payment_info_query = """
            SELECT * FROM Account_Has_PaymentInfo
            WHERE Account_id = %s AND Card_Number = %s
            """
            result = Account_Has_PaymentInfo.objects.raw(account_has_payment_info_query, [str(request.user.id), Credit_Card_Number])[:]

            # If it is not saved to the user's account, insert a new row into Account_has_paymentinfo
            # to save the credit card to the user's account
            if len(result) == 0:
                insert_account_has_payment_info_query = """
                INSERT INTO Account_Has_PaymentInfo(Account_id, Card_Number)
                VALUES (%s, %s)
                """
                cursor.execute(insert_account_has_payment_info_query, [str(request.user.id), Credit_Card_Number])
```

```python

            # Insert a new row into Order table representing that a new order
            # has been made
            insert_order_query = """
            INSERT INTO Orders(Date, Shipping_Address, Shipping_Method, Total_Price)
            VALUES(%s, %s, %s, %s)
            """
            cursor.execute(insert_order_query, [Present_Time, Shipping_Address, Shipping_Method, Total_Price])
            Order_ID = cursor.lastrowid

            # Insert a new row into Checkout table repsenting that the user account
            # has checkout a new order
            insert_checkout_query = "INSERT INTO Checkout(Account_id, Order_ID) VALUES(%s, %s)"
            cursor.execute(insert_checkout_query, [str(request.user.id), Order_ID])

            # For each item in the list of textbooks bought
            for item in Textbooks:
                # Delete from every account's shopping carts that contains this textbook
                delete_from_shopping_carts_query = "DELETE FROM Shopping_Cart WHERE Textbook_ID = %s"
                # Delete from every account's wishlist that contains this textbook
                delete_from_wishlists_query = "DELETE FROM Wishlist WHERE Textbook_ID = %s"
                # Update the Listing table by setting Available to 0, representing that it is not available for sale
                update_listing_query = "UPDATE Listing SET Available = 0 WHERE Textbook_ID = %s"

                # Insert a new row into Order_Contain_Textbook representing that this textbook
                # belongs to this order (sold)
                insert_order_contains_textbook_query = """
                INSERT INTO Order_Contain_Textbook(Textbook_ID, Order_ID)
                VALUES(%s, %s)
                """
                cursor.execute(delete_from_shopping_carts_query, [item])
                cursor.execute(delete_from_wishlists_query, [item])
                cursor.execute(update_listing_query, [item])
                cursor.execute(insert_order_contains_textbook_query, [item, Order_ID])
        connection.close()
    return JsonResponse({'redirect': reverse('homepage')})
```

```
payment_info_query = "SELECT * FROM PaymentInfo WHERE Card_Number = %s"
Credit_Card = PaymentInfo.objects.raw(payment_info_query, [Credit_Card_Number])[:]
if len(Credit_Card) == 0:
      insert_payment_info_query =
       """
      INSERT INTO PaymentInfo(Card_Number, Card_Name, Security_Code,
       Expiration_Date, Billing_Address)
      VALUES(%s, %s, %s, %s, %s)
       """
cursor.execute(insert_payment_info_query, [Credit_Card_Number, Credit_Card_Name,
Credit_Card_Security_Code, Credit_Card_Expire_Date, Billing_Address])
```

This section of code first query the PaymentInfo table for a row with the specified Card Number. If the result return 0 row, that mean the credit card is not yet in the database then we will insert a new row into PaymentInfo containing the credit card information representing the new credit card inserted.

```
account_has_payment_info_query =
"""
SELECT * FROM Account_Has_PaymentInfo
WHERE Account_id = %s AND Card_Number = %s
"""
result = Account_Has_PaymentInfo.objects.raw(account_has_payment_info_query,
[str(request.user.id), Credit_Card_Number])[:]
if len(result) == 0:
    insert_account_has_payment_info_query = """
    INSERT INTO Account_Has_PaymentInfo(Account_id, Card_Number)
    VALUES (%s, %s)
    """
    cursor.execute(insert_account_has_payment_info_query,
    [str(request.user.id), Credit_Card_Number])
```

Similarly, this section of code query the Account_has_PaymentInfo table and checks if there is a row that shows that this credit card is saved to the user's account. If not, then insert a new row into Account_Has_PaymentInfo to represents that this credit card is now saved to the user's account.

```
nsert_order_query =
"""
INSERT INTO Orders(Date, Shipping_Address, Shipping_Method, Total_Price)
VALUES(%s, %s, %s, %s)
"""
cursor.execute(insert_order_query, [Present_Time, Shipping_Address, Shipping_Method,
Total_Price])
```

This section of code insert a new row into Orders table representing a new Order has been made.

```
insert_checkout_query = "INSERT INTO Checkout(Account_id, Order_ID) VALUES(%s, %s)"
cursor.execute(insert_checkout_query, [str(request.user.id), Order_ID])
```

This part insert a new row into Checkout table representing that the user account has just checkout the newly created order.

```
for item in Textbooks:
    delete_from_shopping_carts_query = "DELETE FROM Shopping_Cart WHERE
    Textbook_ID = %s"
    delete_from_wishlists_query = "DELETE FROM Wishlist WHERE Textbook_ID =
    %s"
    update_listing_query = "UPDATE Listing SET Available = 0 WHERE
    Textbook_ID = %s"
    insert_order_contains_textbook_query =
    """
```

```
    INSERT INTO Order_Contain_Textbook(Textbook_ID, Order_ID)
    VALUES(%s, %s)
    """
    cursor.execute(delete_from_shopping_carts_query, [item])
    cursor.execute(delete_from_wishlists_query, [item])
    cursor.execute(update_listing_query, [item])
    cursor.execute(insert_order_contains_textbook_query, [item, Order_ID])
```

Note that item here is a textbook_id and Textbooks is just a dictionary that contains Textbook_IDs.

For each item in Textbooks, delete from Shopping_Cart every row with Textbook_ID = item which represents removing the item from every account's shopping cart.

Delete from Wishlist every row with Textbook_ID = item which represents removing the item from every account's wish list.

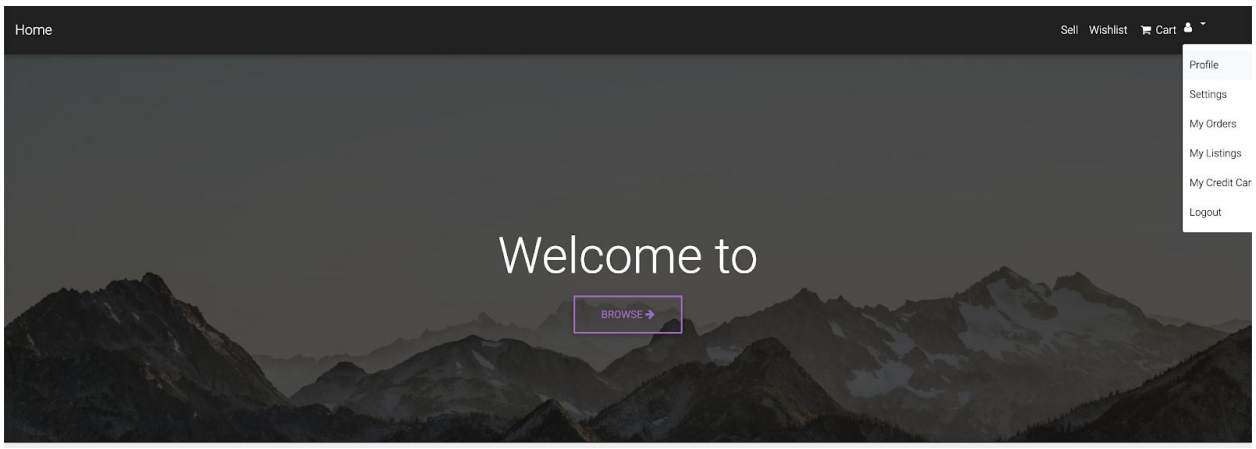
Update the row in Listing table where Textbook_id = item by setting Available to 0 represents updating the listing that it is no longer available for sale.

Insert a new row into Order_Contains_Textbook representing that the new order we created contain this textbook.

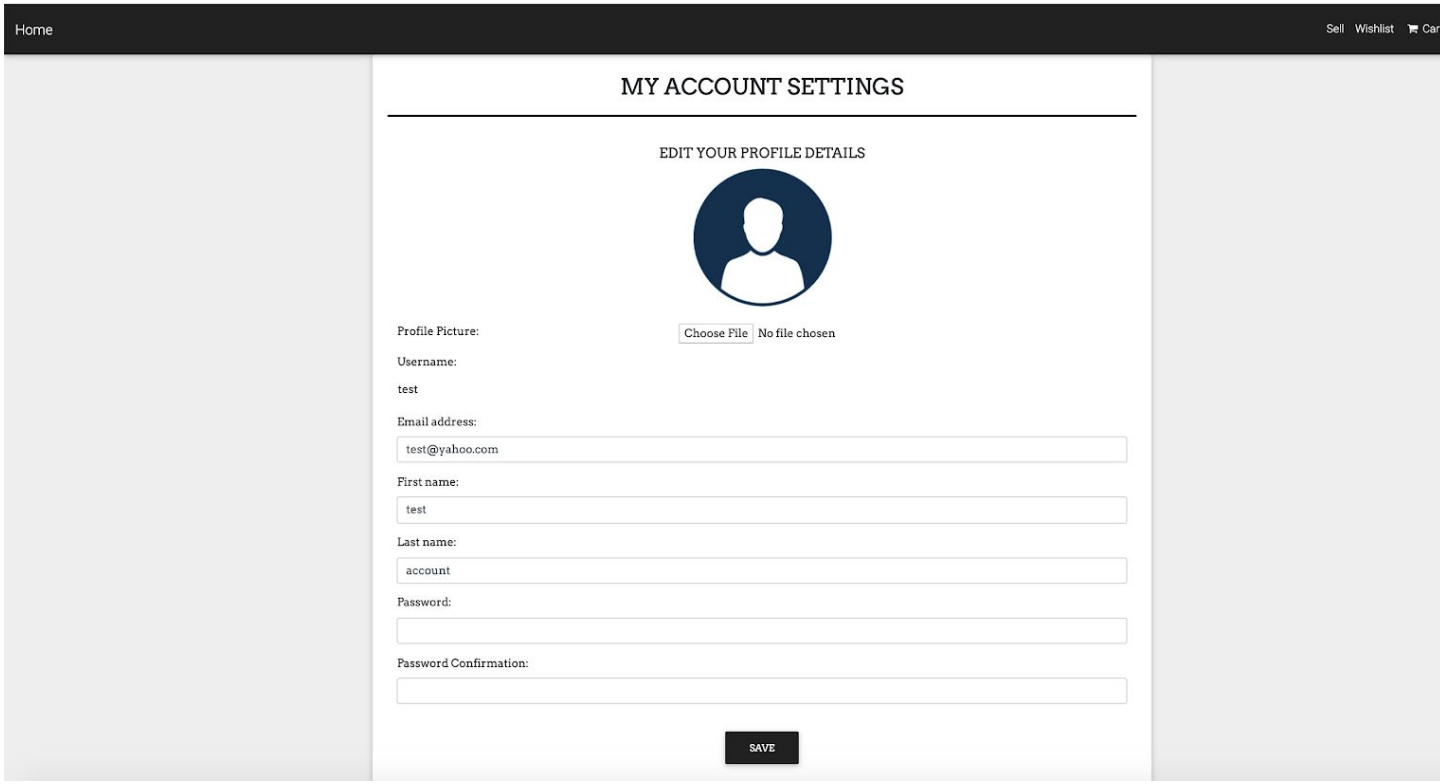
Finally, I just return a JsonResponse with a message containing the url to redirect the user after finish checking out the order.

Changing Account Settings:

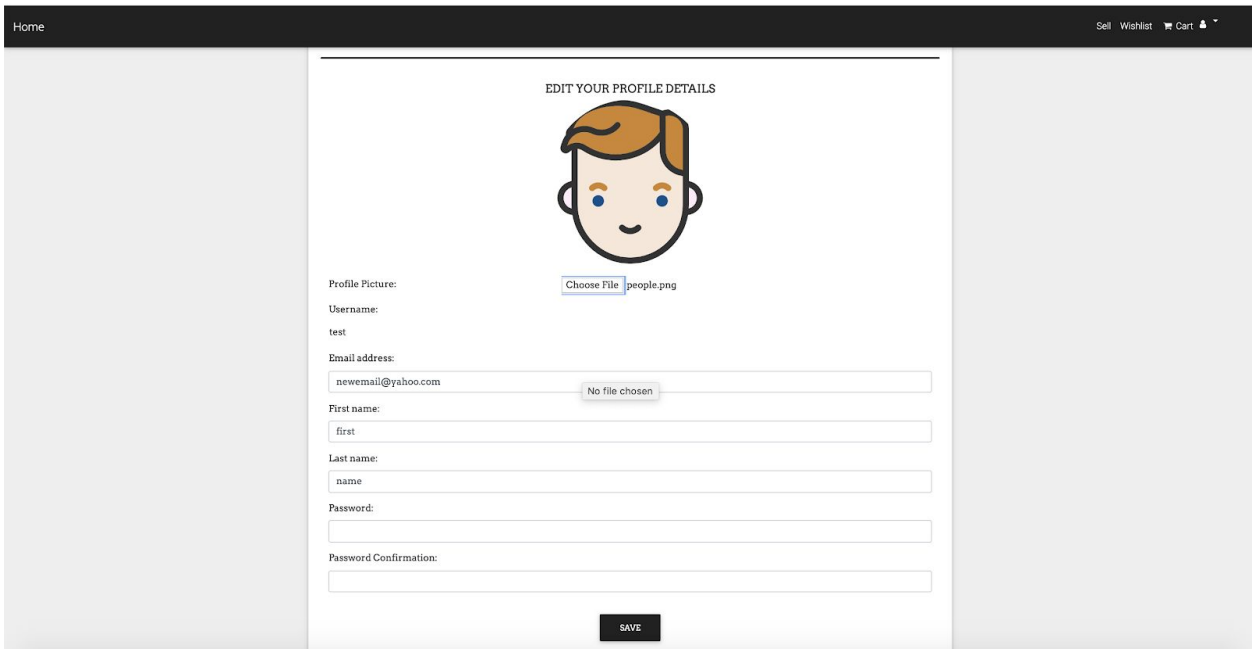
For this feature, I will use update to update a row from Account table



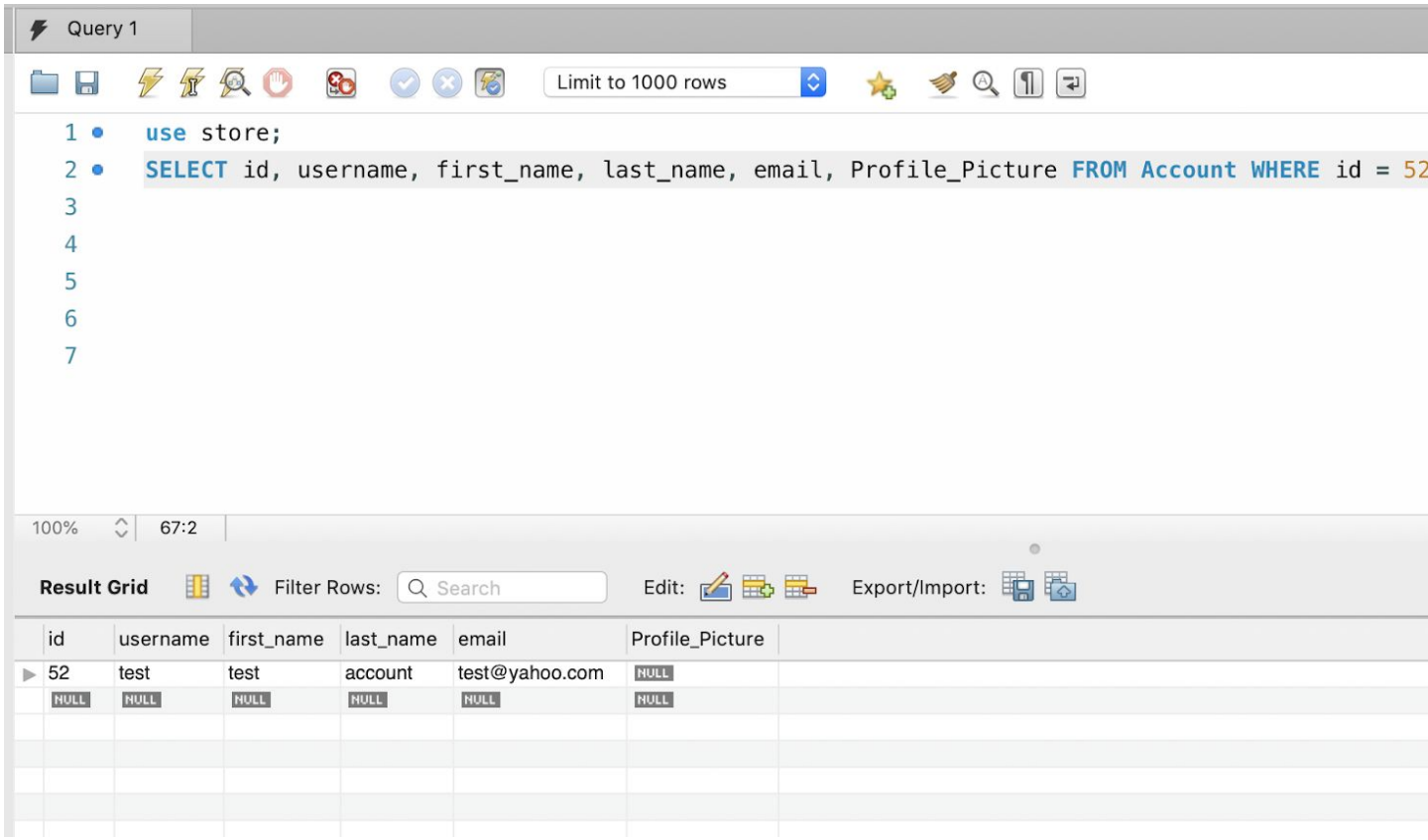
Press the avatar drop down button on the upper right corner and select Settings in order to change your account information



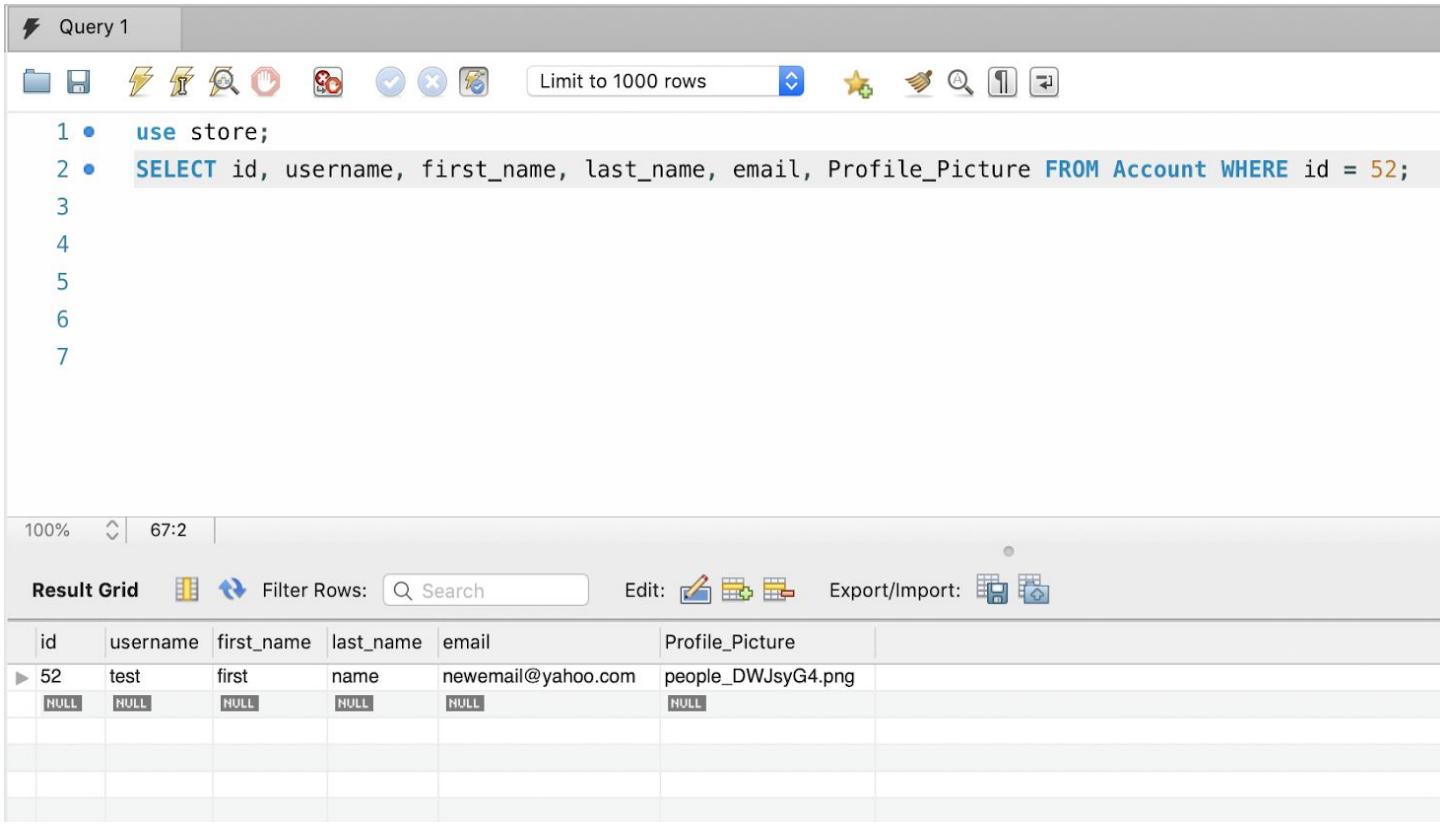
A form similar to this should appear with your account information filled out



This is the account information after I changed the input fields and click save. I added a new profile picture, changed the email address, first_name, and last_name



This query shows the information of the Account before I change the email, first name, last name, and profile picture



After changing the information, you can see that row in Account table has updated the first_name, last_name, email column and Profile Picture is no longer null.

Backend Logic:

```
161 @login_required
162 def settings(request):
163
164     user_query = "SELECT * FROM Account WHERE username = %s;"
165     user_query_arguments = [request.user.username]
166
167     user = Account.objects.raw(user_query, user_query_arguments)[0]
168     data = {'email': user.email, 'first_name': user.first_name, 'last_name': user.last_name}
169
170     # Populate the form with the user's email, first name, last name
171     form = forms.AccountChangeForm(initial=data)
172     if request.method == 'POST':
173         form = forms.AccountChangeForm(request.POST)
174         with connection.cursor() as cursor:
175             if(form.is_valid()):
176                 modified_data = {};
177                 password = make_password(request.POST.get('password'))
178                 if request.user.check_password(request.POST.get('password')):
179                     pass;
180                 else:
181                     cursor.execute("UPDATE Account SET password = %s WHERE username = %s;", [password, request.user.username])
182                     user = Account.objects.raw('SELECT * FROM Account WHERE username = %s AND password = %s', [request.user.username, password])[0]
183                     auth_login(request, user);
184
185                 if request.FILES.get('Profile_Picture') is not None:
186                     request.user.Profile_Picture = request.FILES.get('Profile_Picture');
187                     request.user.save()
188
189                 cursor.execute("UPDATE Account SET email = %s, first_name = %s, last_name = %s WHERE username = %s;", [request.POST.get('email'),\
190                                 request.POST.get('first_name'), request.POST.get('last_name'), request.user.username])
191
192                 modified_data['email'] = request.POST.get('email')
193                 modified_data['first_name'] = request.POST.get('first_name')
194                 modified_data['last_name'] = request.POST.get('last_name')
195                 new_form = forms.AccountChangeForm(initial=modified_data)
196                 auth_login(request, request.user)
197                 return render(request, 'Settings.html', context={'form': new_form})
198             else:
199                 print(form.errors)
200
201         connection.close()
202     return render(request, 'Settings.html',context={'form':form});
203
```

Line 147-154 is for querying user account information and constructing an account settings change form using the data we query

```
user_query = "SELECT * FROM Account WHERE username = %s;"
user_query_arguments = [request.user.username]
user = Account.objects.raw(user_query, user_query_arguments)[0]
data = {'email': user.email, 'first_name': user.first_name, 'last_name':
user.last_name}
form = forms.AccountChangeForm(initial=data)
```

This retrieves the email, first name, last name info stored in your account and formatted into a dictionary. Then a form is initialized using that dictionary so that the form is prefilled with the

account information such as the email input field being filled with your email address stored in the database.

LINE 155 - 181 is where the logic for updating account information is done:

```
password = make_password(request.POST.get('password'))
if request.user.check_password(request.POST.get('password')):
        Pass;
Else:
        cursor.execute("UPDATE Account SET password = %s WHERE username = %s;",
        [password, request.user.username])
        user = Account.objects.raw('SELECT * FROM Account WHERE username = %s AND
        password = %s', [request.user.username, password])[0]
        auth_login(request, user);
```

First, the password is hashed using the make_password function. Then the check_password function is used to see if the hashed password matches the current password. If it does, then it does nothing. Else, I update the Account table with the new hashed password by filtering with username

Since I just modified the logged in user's information, Django requires me to relogin so I query the row in Account that matches the username and password and use auth_login to logs in.

```
if request.FILES.get('Profile_Picture') is not None:
        request.user.Profile_Picture = request.FILES.get('Profile_Picture');
        request.user.save()
```

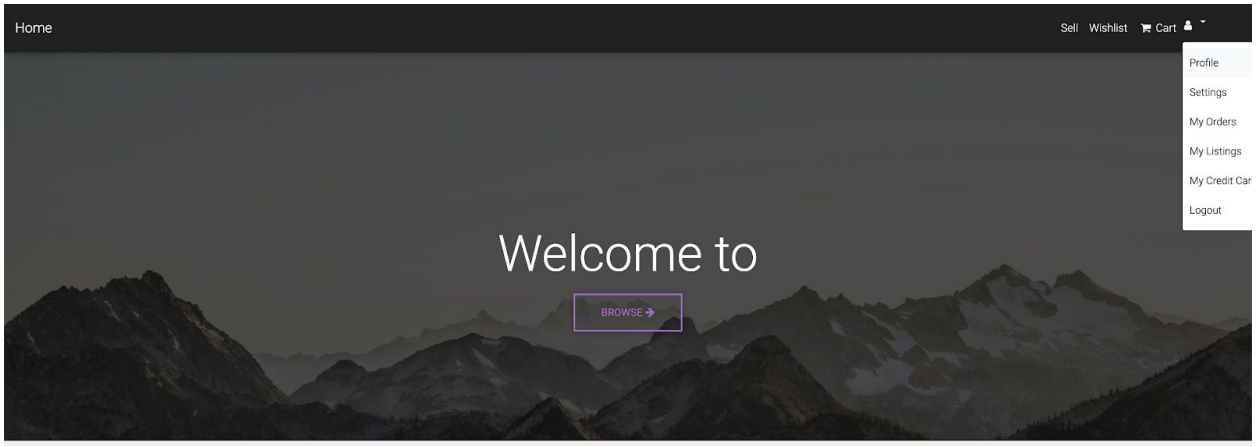
This section checks if the Profile Picture was changed. If yes, then uploads the Profile Picture into the media folder.

Finally in line 172,

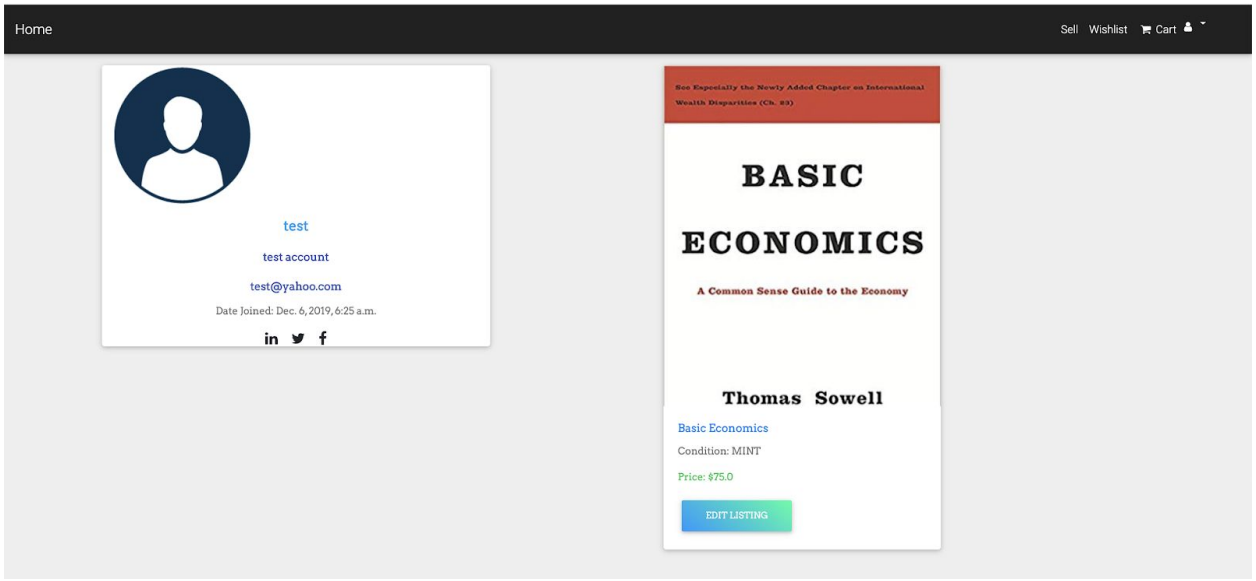
```
cursor.execute("UPDATE Account SET email = %s, first_name = %s, last_name = %s WHERE username = %s;", [request.POST.get('email'), request.POST.get('first_name'), request.POST.get('last_name'), request.user.username])
```

This query simply update the email, first_name, last_name by filtering based on the session username.

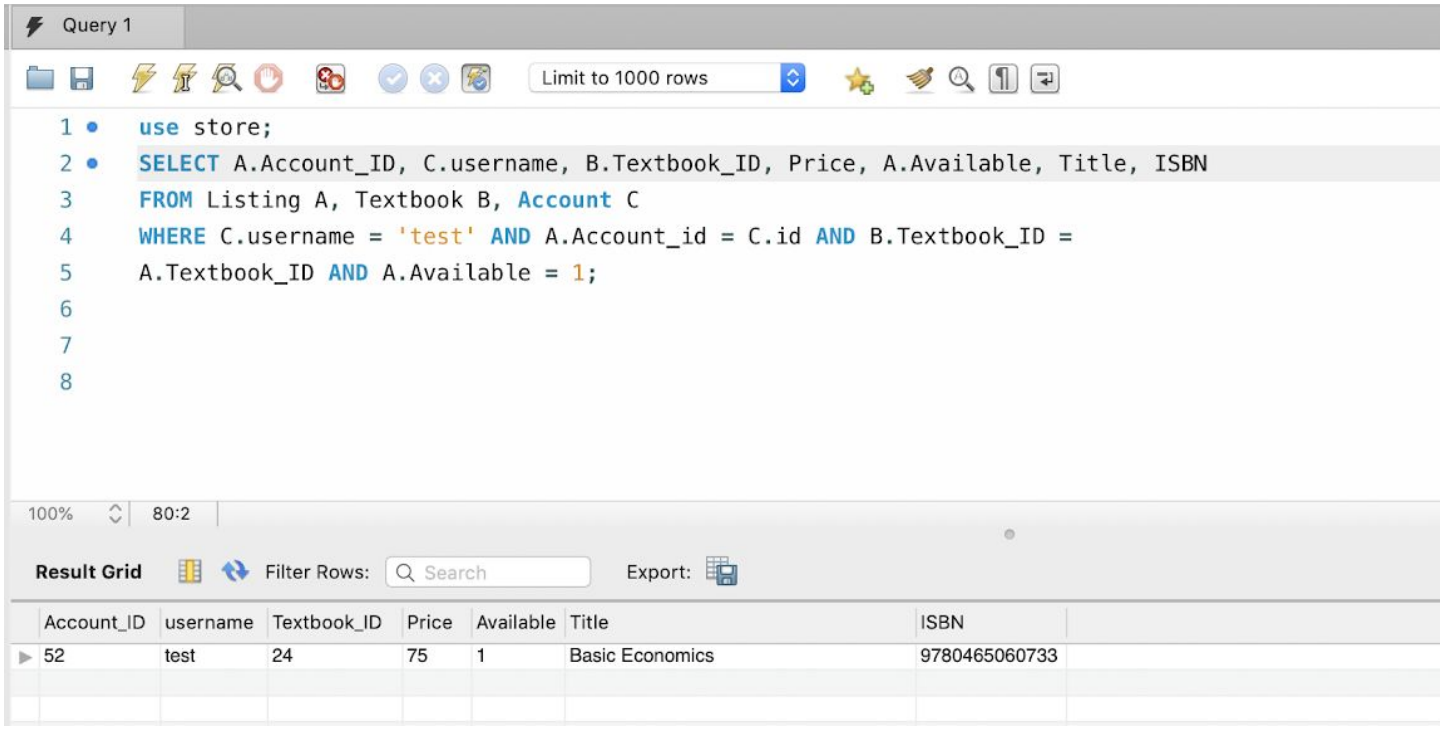
VIEW PROFILE:



As shown above, you can clicks on the avatar dropdown button on the upper right corner and clicks on Profile option to view your profile. It will returns to you a view similar to below:



The left side contains your profile picture (if you don't have one then it shows a default picture) and on the right side will be a list of your active listings for sale.



This is the view active listings query result which matches up with the GUI above.

```
@login_required
def view_profile(request, account_username):
    account = Account.objects.raw("SELECT * FROM Account WHERE username = %s", [account_username])[0];
    listing_query = """
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE C.username = %s AND A.Account_id = C.id AND B.Textbook_ID = A.Textbook_ID
    AND A.Available = 1
    """
    listings = Listing.objects.raw(listing_query, [account_username])
    return render(request, 'Other_Users_Profile.html', context={'account':account, 'Listings': listings})
```

This function takes in an argument account_username used to identify which account profile will be displayed.

First query:

```
account = Account.objects.raw("SELECT * FROM Account WHERE username = %s",
[account_username])[0];
```

Straight forward, simply select the row in Account that matches the argument account_username

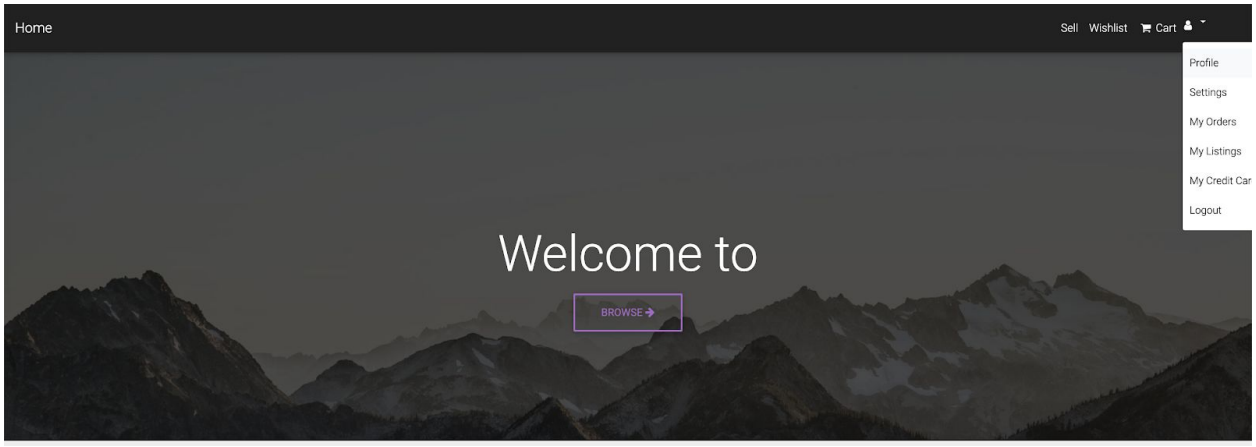
```
listing_query =
```

```
"""
    SELECT *
    FROM Listing A, Textbook B, Account C
    WHERE C.username = %s AND A.Account_id = C.id AND B.Textbook_ID =
    A.Textbook_ID
    AND A.Available = 1
"""
    listings = Listing.objects.raw(listing_query, [account_username])
```

This join table Listing, Textbook, Account where the Account.username = account_username, where account_id of Listing & Textbook are the same, and where Textbook_id of Textbook & Listing are the same.

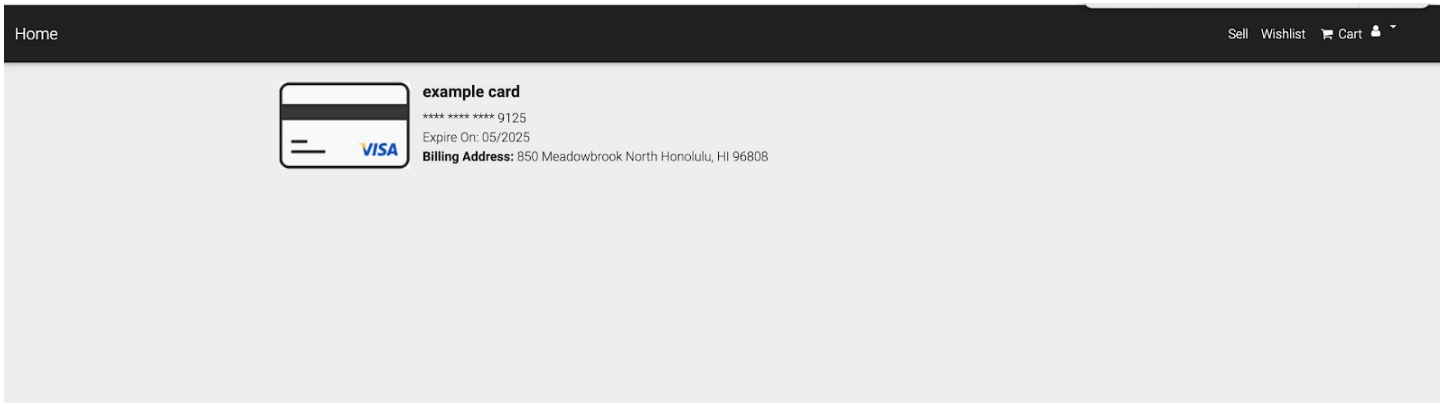
Then this function passes in the results of account query and listing query into render function to render Other_Users_Profile.html

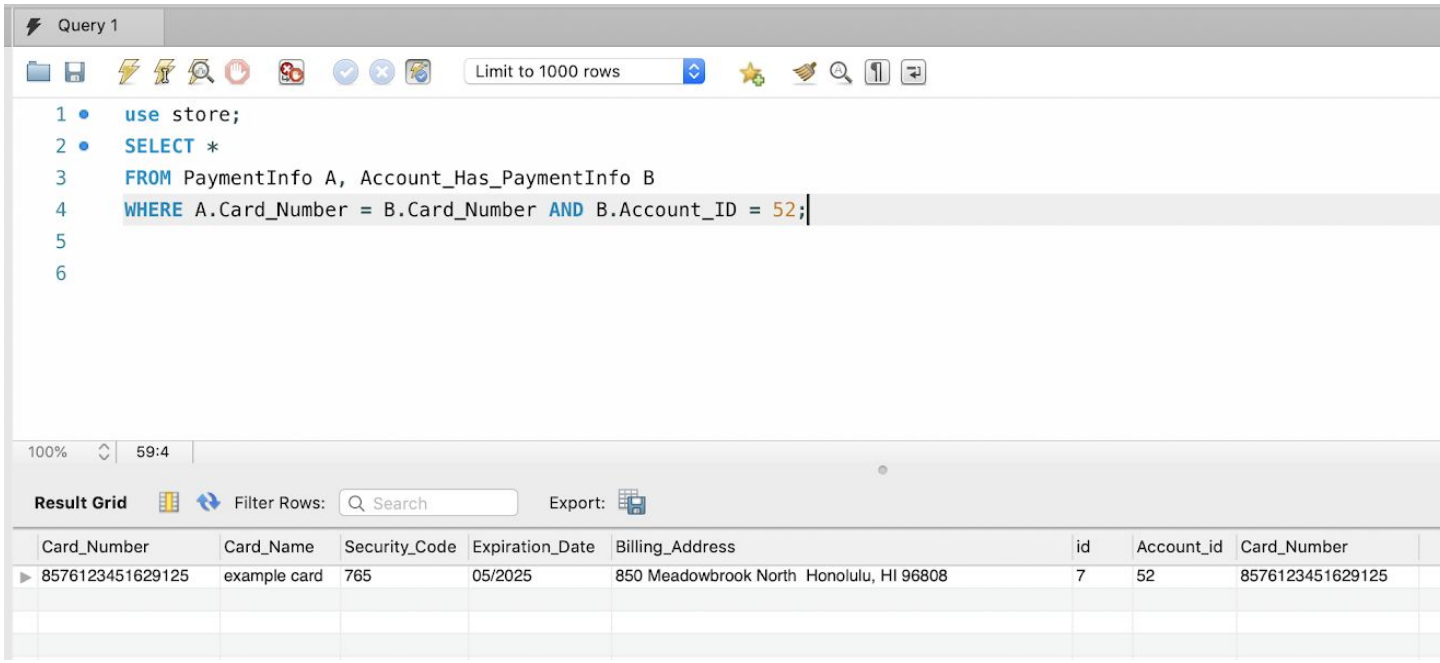
VIEW CREDIT CARDS



As shown above, click on the avatar picture in the upper right corner and you can click on the

My Credit Cards option to view the credit cards saved to your account.





This is result of view credit card query in MySQL workbench which matches the results shown in the GUI.

BACKEND LOGIC

```
@login_required
def view_credit_cards(request):

    # Selects all the credit cards saved to the user's account
    Credit_Card_Query = """
    SELECT *
    FROM PaymentInfo A, Account_Has_PaymentInfo B
    WHERE A.Card_Number = B.Card_Number AND B.Account_ID = %s
    """
    Credit_Cards = PaymentInfo.objects.raw(Credit_Card_Query, [str(request.user.id)])
    return render(request, 'My_Credit_Cards.html', context={'Credit_Cards': Credit_Cards})
```

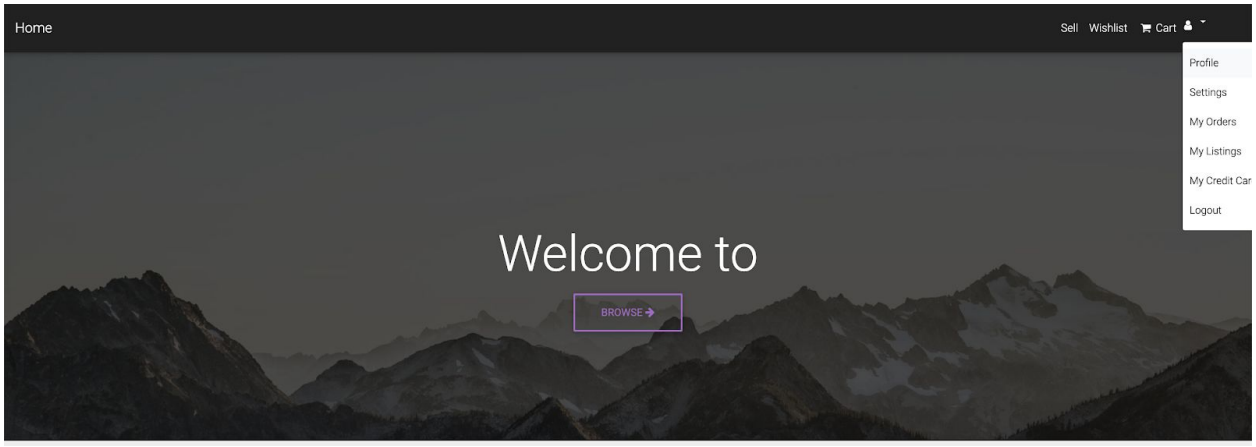
```
Credit_Card_Query =
"""
SELECT *
```

```
FROM PaymentInfo A, Account_Has_PaymentInfo B

WHERE A.Card_Number = B.Card_Number AND B.Account_ID = %s

"""
```

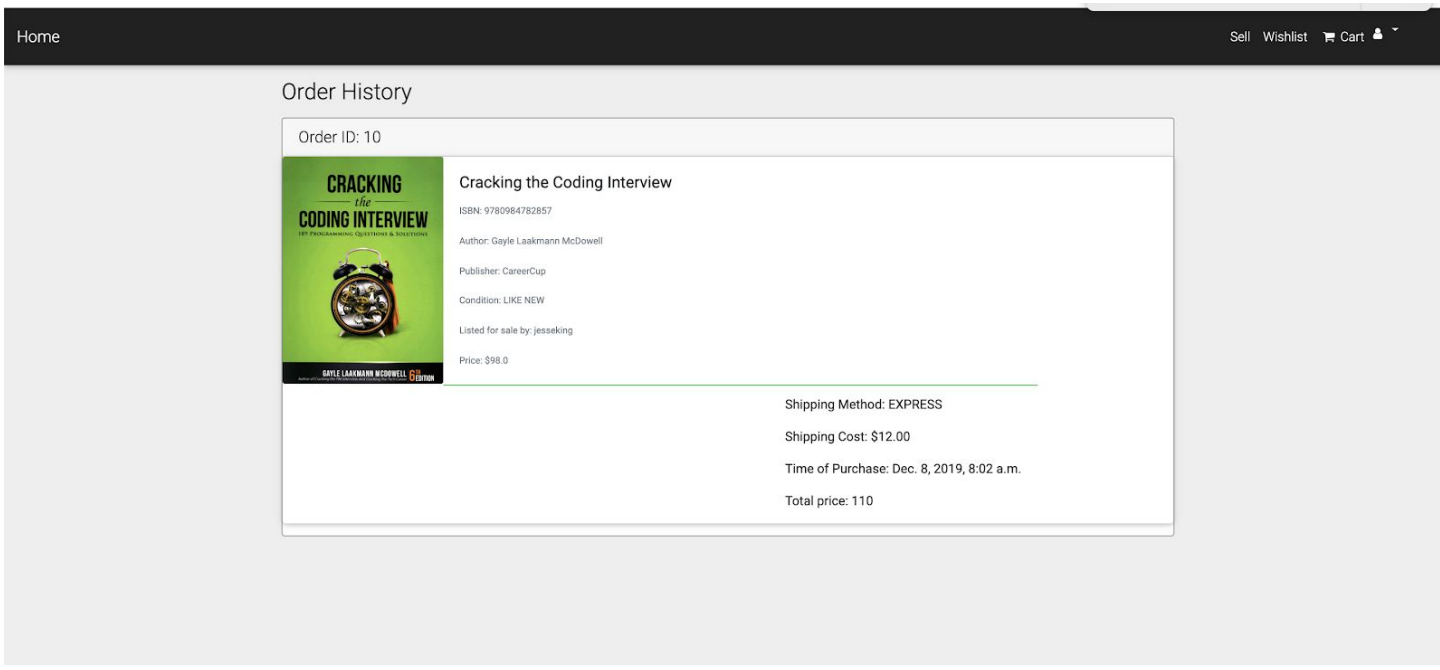
This query joins PaymentInfo and AccountHasPaymentInfo table on the condition that their Card Number are the same and the Account_ID is equals to the logged in user's account id.

The purpose is to selects all the credit cards saved to that user's account and pass the result into the render function for rendering My_Credit_Cards.html view.

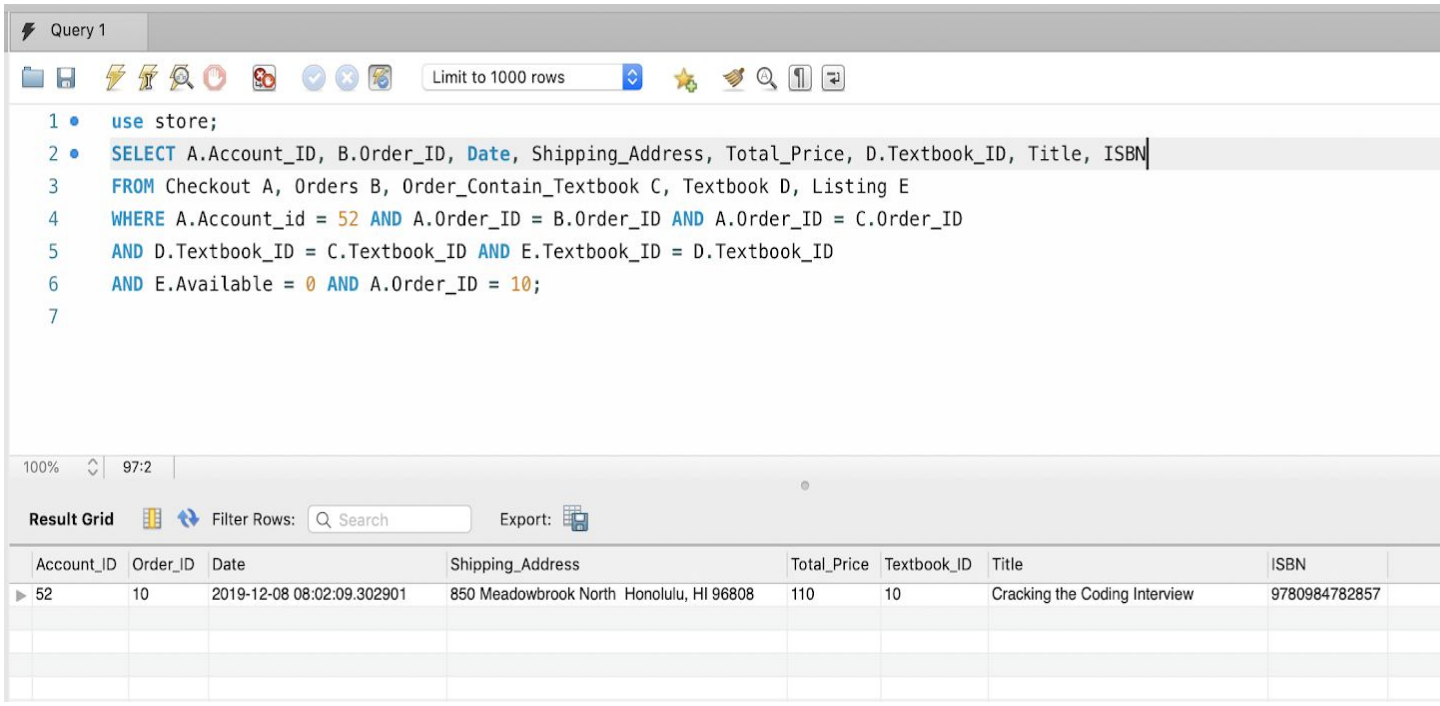
VIEW ORDERS



You can click on the avatar dropdown button in the upper right corner and select My Orders to view your order history.



Your new order will appear in your order history



This is the view order query results from MySQL workbench for Order_ID 10 and Account_ID 52 which matches with the results returned on the GUI.

BACKEND LOGIC

```
@login_required
def view_orders(request):

    # Select all of the order checkouts that the user has done
    Checkouts = Checkout.objects.raw("SELECT * FROM Checkout WHERE Account_id = %s ORDER BY Order_ID DESC;", [str(request.user.id)])
    Checkouts = Checkouts[:]
    Orders = {}

    # For each checkout the user has done, perform a few query to find the list of textbooks
    # and lsit of sellers for those textbooks for that checkout order.
    for checkout in Checkouts:

        # Select the list of textbooks that was bought in this checkout
        textbooks_query = """
        SELECT *
        FROM Checkout A, Orders B, Order_Contain_Textbook C, Textbook D, Listing E
        WHERE A.Account_id = %s AND A.Order_ID = B.Order_ID AND A.Order_ID = C.Order_ID
        AND D.Textbook_ID = C.Textbook_ID AND E.Textbook_ID = D.Textbook_ID
        AND E.Available = 0 AND A.Order_ID = %s
        """
        list_of_textbooks = Order_Contain_Textbook.objects.raw(textbooks_query, [str(request.user.id), str(checkout.Order.Order_ID)])
        list_of_textbooks = list_of_textbooks[:]

        # Select the list of sellers that sold the textbooks bought in this checkout
        sellers_query = """
        SELECT *
        FROM Account A, Listing B, Order_Contain_Textbook C
        WHERE A.id = B.Account_ID AND B.Available = 0 AND B.Textbook_ID = C.Textbook_ID AND C.Order_ID = %s
        """
        list_of_sellers = Account.objects.raw(sellers_query, [str(checkout.Order.Order_ID)])
        list_of_sellers = list_of_sellers[:]

        # This dictionary Orders contains the information of all orders the user has checkout
        # Each element in this dictionary is of the format [Order ID] : [list of textbook, list of sellers]
        # I use the zip function of list_of_textbooks and list_of_sellers because it let me iterate
        # through both list at once and that is useful since the first textbook in list of textbook
        # is sold by the first seller in list of sellers and so on
        Orders[checkout.Order.Order_ID] = zip(list_of_textbooks, list_of_sellers)

    return render(request, 'Orders.html', context={'Orders': Orders})
```

`Checkout.objects.raw("SELECT * FROM Checkout WHERE Account_id = %s ORDER BY Order_ID DESC;", [str(request.user.id)])`

This query selects all the rows in Checkout with Account_id equals to the logged in user's account id which is all of the checkout orders that the account has done.

Then for each row returned in the above checkout query, two query is performed:

`textbooks_query =`

```
"""
SELECT *
FROM Checkout A, Orders B, Order_Contain_Textbook C, Textbook D, Listing E
WHERE A.Account_id = %s AND A.Order_ID = B.Order_ID AND A.Order_ID = C.Order_ID AND
D.Textbook_ID = C.Textbook_ID AND E.Textbook_ID = D.Textbook_ID AND E.Available = 0
AND A.Order_ID = %s
"""
```

This query join Checkout, Order, Order_Contain_Textbook, Textbook, and Listing table on the condition that Order_ID of Orders & Checkout & Order_Contain_textbook are the same, Textbook_ID of Textbook & Order_Contain_Textbook & Listing are the same, Listing.Available = 0 (not available for sale), and Order_ID equals to the specific order ID of that checkout.

The purpose is to find the specific list of textbooks sold for that checkout and all of the relevant information about that textbook listing.

```
sellers_query =
"""
SELECT *
FROM Account A, Listing B, Order_Contain_Textbook C
WHERE A.id = B.Account_ID AND B.Available = 0 AND B.Textbook_ID = C.Textbook_ID AND
C.Order_ID = %s
"""
```

This query join Account, Listing, and Order_Contain_Textbook on the condition that Account_ID of Account & Listing are the same, Textbook_ID of Listing and Order_Contain_Textbook are the same, Listing.Available = 0 (not available for sale) and Order_ID is equals to the order ID of that checkout.

The purpose is to find the list of sellers that sold the textbooks bought for that checkout.

The first textbook returned in the list of textbook query is sold by the first seller return in the list of sellers query and so on.

The results is then formatted into an Orders dictionary which contains the information about all the orders that the user checkout and then passed into the render function for rendering Orders.html to return a view of all orders purchased.

HOW TO SETUP ON MACOS

1. Install python3 by following this link and downloading the package and install
2. Download get-pip.py running the following command in terminal

   ```
   curl https://bootstrap.pypa.io/get-pip.py -o get-pip.py
   ```
3. Now run

   python3 get-pip.py
4. Pull our git repo using git pull to your machine

   https://github.com/aldrichmangune/CS157A-Team25
5. Install virtualenv with

   pip3 install virtualenv
6. Set up a directory for your virtual environment with

   python3 -m virtualenv directoryname (choose a directoryname)
7. Run source dirname/bin/activate, where dirname is the directory you just set up for your virtual environment
8. Make sure your virtual environment is activated and run

   pip3 install django=='2.2.6'
9. Now run

   pip3 install mysql-connector-python
10. Now run

    pip3 install Pillow
11. Now head over to where you pulled our git repo and move into the project folder where our code is contained. Should be in CS157A-TEAM25/project folder

12. Go to project/settings.py, open it and changes the database credentials to match yours.

    (Note: this is located in CS157A-TEAM25/project/project/settings.py)

```
81
82  DATABASES = {
83      'default': {
84          'ENGINE': 'mysql.connector.django',
85          'NAME': 'store',
86          'USER': 'root',
87          'PASSWORD': 'password',
88      }
89  }
90
```

    This part in the settings.py is the database settings. Name is name of the database, user is username and password is password used to login to MySQL.

13. Run python3 manage.py makemigrations

    It should say no changes detected

14. Run python3 manage.py migrate

15. Now go to MySQL workbench or login to MySQL with your terminal and write

```
INSERT INTO Category VALUES ('Computer Science'), ('Chemistry'),
('Mathematics'),('History'), ('Law'), ('Medicine'), ('Physics'),
('Engineering'), ('Arts'), ('Literature'), ('Finance');
```

    Our webapp doesn't let the user add in Categories so we add the Category ourselves with MySQL workbench.

16. Go CS157A-TEAM25/project and to starts the server run

    python3 manage.py runserver

    (Note: When you want to run the application, make sure your virtualenv you created earlier is activated using source virtualenvdirectory/bin/activate like before)

17. Go to localhost:8000 to run our web app.

PROJECT CONCLUSION

Improvements for Future Version:

In the future version, we would like to add some credit card verification API to check if the credit card is valid also implements Paypal API for users to pay with Paypal. We would also like a review feature for the buyers to add reviews and rate sellers. Instead of just one picture for each textbook listing, we ideally would like a panels of pictures that would best display the condition of the textbook. A chat feature or some kind of message system between users would help facilitate the purchasing process between buyer and seller. Finally, we would also probably redesign the UI to makes it look more professional.

Lessons Learned:

I have never worked on a 3 tier architecture prior to doing this project and it wasn't easy to finish this project in the small timeframe we had. When I started this project, all I knew was Python and HTML5/CSS3 so I had to learn an entirely new web framework (Django), MySQL, Bootstrap, Javascript and JQuery in order to build this project. Overall, this project has propelled me to learn a lot of new things beyond just databases that will be helpful for me in the future. I regret skimping on the UI since I had neither the time nor the expertise to polish it as I had hoped. Regardless, I am happy with the backend features we have done and what I have learned from this experience.

- Au Tran