

CS 564

Stage 5 Report

jianyan chen, wenquan chen, yudong huang

(book marks are provided for navigation)

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1. Ways to run our application

We built a web application, it can either be run at this address (GCP):

<https://focused-studio-189004.appspot.com>

Or be run using localhost:5000

If you are using localhost:5000, please install flask and python3 first. To link python3 with flask (in case python2 was linked with flask), please install python3 and pip first, then use “pip3 install flask” (with any permission you need) to install flask. Then use command line to go to the root directory of file program (the one contains .py, and there is only one .py file for the entire program), and type in “python3 main.py” (or “python main.py” if you only have python3 installed)

If the GCP does not work, please do consider evaluating our work using localhost.

2. We used sqlite3 as DBMS for this program

3. Interfaces:

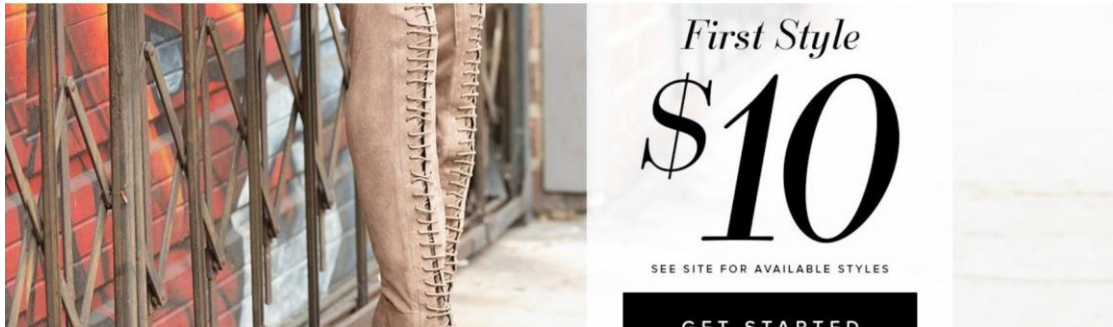
Before going into interfaces, our website is an trading application, which primarily targets women shoes.

Index

The main page is index, you must login first before reaching any other interfaces.



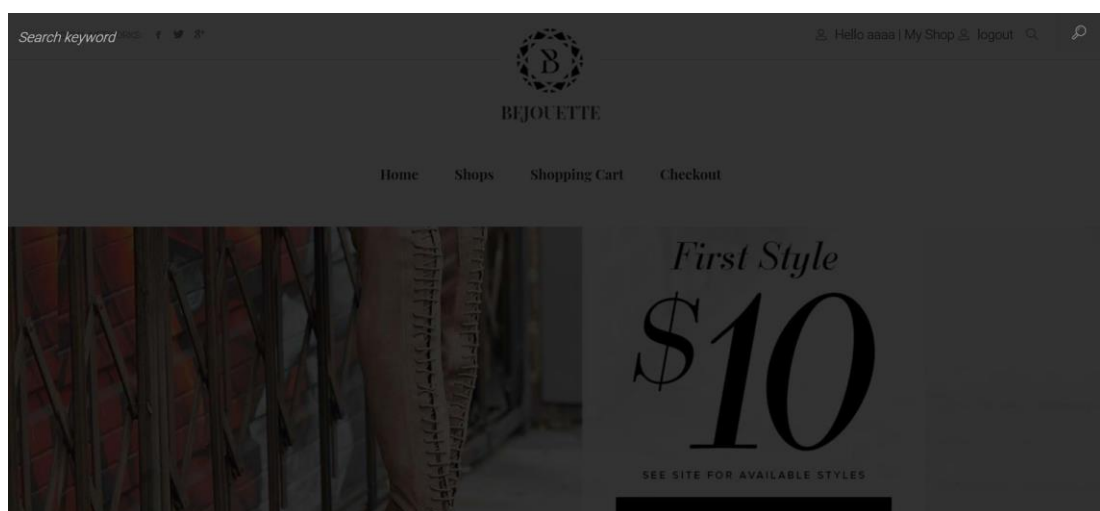
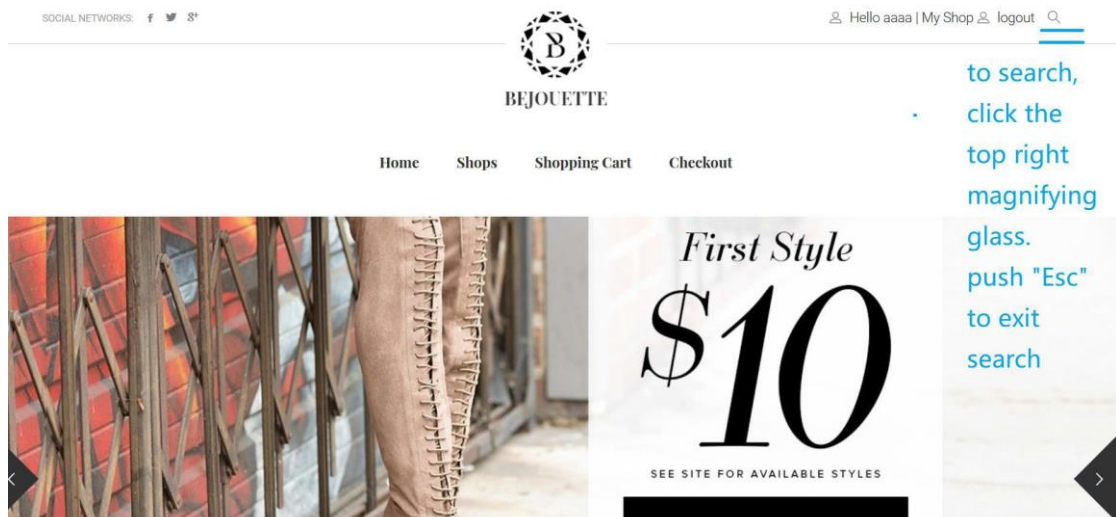
to login click here



There is also a “My Account” button, clicking it will pop out a menu, asking you to login.

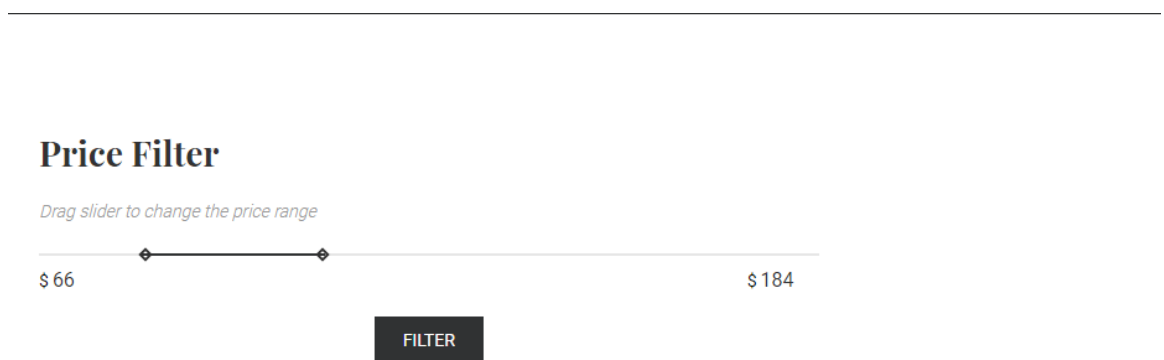


After logging in, on the top right, there is a magnifying glass, which is used for searching goods in entire website. The searching supports direct matching of brand, key words searching on brands and item names.



Hit "Enter" to search, hit "Esc" to exit searching.

Below there is a filter bar that allows you to filter the items by a range of prices, select the low and high limit of the price to see the items within your price of choice.



Features

If you scroll down the main page, you will see about 20 pictures. Hover above the pictures, you can either view this picture or go to that specific item's page (require logging in first).

Features



SKECHERS | ★★★★★

Pellentesque pretium

otal comfort and great style with the SKECHERS EZ Flex 2 - Quipster shoe. Smooth faux leather and m

[SHOP NOW](#) **\$187.00**



Hover your mouse on a picture!

(pictures are thrown randomly from sqilte3 database)

Home

Shops

Shopping Cart

Features



TANT INFO, PLEASE GO TO:
tobucket.com/P500



6-1890004-annsnot.com/product?iid=2958



SKECHERS

★★★★☆

Pellentesque pretium

otal comfort and great style with the SKECHERS EZ Flex 2 - Quipster shoe. Smooth faux leather and m

SHOP NOW

\$187.00



There is also a footer at the bottom, but we did not implement any function for it. It makes the web page look complete

The menu bar show 4 entries after logging in. The first one is “home”, which directs back to main page. The second one is “shops”, which directs to all shops operated by some users of this website. The third one is shopping cart, which can view any items that you have saved for checking out. The fourth one is checkout, which allows you to pay (not really).



Registration

An easy registration, only need username and password, after clicking “register now”, you are also logged in.

The image shows the registration form on the Bejouette website. At the top left, there is a small circular logo with a stylized 'B'. To the right of the logo, there is a horizontal navigation bar with five links: "Home", "Shop", "Shopping Cart", "Checkout", and "Login". Below the navigation bar, the word "Registration" is written in a large, bold, sans-serif font. Underneath "Registration", there is a breadcrumb trail: "HomePage / Shop / Registration". The form itself consists of three input fields: "username *", "Password *", and "Confirm Password *". Each field has a red asterisk indicating it is required. Below the input fields, there are two buttons: "Register Now" and "Clear Form".

Shops

The menu bar has similar content with index page, with a extra link to “logout”.

An entry to view all shops by their name. There are over 300 shops, and each page only shows 12 shops at max. We implemented our own pagination, which only has very basic functions: go to previous page, showing current page and go to next page.



All Shops

[Home](#)



★★★★☆

Eviciti Corp

[GO TO SHOP](#)

★★★★☆

Lindley Mechanical Services

[GO TO SHOP](#)

★★★★☆

Cyberjunkstore.com

[GO TO SHOP](#)



★★★★☆

Metro Community Ministries

[GO TO SHOP](#)

★★★★☆

George Armes

[GO TO SHOP](#)

★★★★☆

This-N-That Country Store

[GO TO SHOP](#)

★★★★☆

Airline Seat Shop

[GO TO SHOP](#)

★★★★☆

Brushy Mountain Market

[GO TO SHOP](#)

★★★★☆

Atsuko Jozaki

[GO TO SHOP](#)

Shop-indi:

The menu bar has same content with Shops page.



Lindley Mechanical Services

[Home](#) / [Shop](#) / [Products](#)
consectetur adipisicing elit. Dicta temporibus voluptatem



In Shop Search

When you click “go into shop” from previous page, you will be directed to a page for

individual shop, which shows all items that this shop is currently selling.

HomeShopsShopping CartCheck

NOVICA★★★★☆
Handcrafted Alpaca Blend 'Purple Charisma' Sweater (Peru)
ADD TO CART 62.99

MO MO★★★★☆
Mo Mo Womens' Tandy Beaded Harness Ankle Boot
ADD TO CART 32.97

SKECHERS★★★★☆
Skechers Go Walk Women Us 8.5 Black Walking Shoe Pre Owned 1661
ADD TO CART 24.99

In Shop Search

Search...

Price Filter

Drag slider to change the price range

\$150

\$3

FILTER

Each item has a picture, which is loaded from its URL somewhere else. But when if you click the picture, or the name of that item, it will leads you to a page of that item, which shows more details about that item. Some pictures are bad links (server not found), we managed to load a default “image not found” picture, but you can still go to the page for that item. You can also click “add to cart”, which will make this item show up in your cart, with quantity 1.

HomeShopsShopping CartCheckoutLogout

☆☆
Tandy Ankle Boot

SKECHERS★★★★☆
Skechers Go Walk Women Us 8.5 Black Walking Shoe Pre

In Shop Search

Search...

Price Filter

Drag slider to change the price range

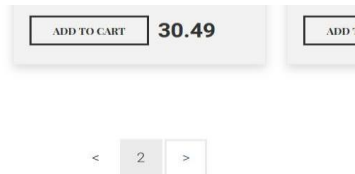
\$150

\$300

FILTER

At right side, there are two ways to search items within this shop.

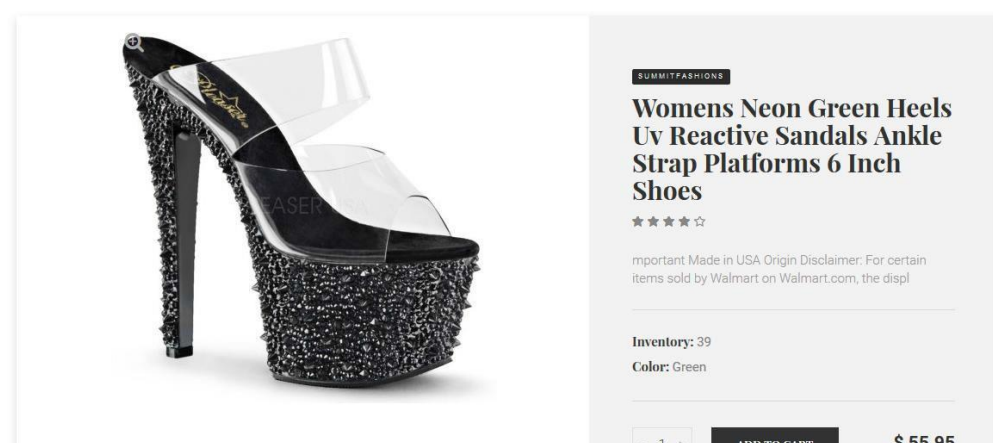
The search box allows in-shop search for brand name, brand key words and item key words. The price filter filters out the price after clicking “filter”. Note that the side bar always remembers your previous input, but it is not effective when you first enters a shop. The two search methods do no overlap (because we don’t have enough time to do such a fancy function...).



At the bottom there is own humble pagination. More than 10000 items are divided evenly (with a bit skew) through over 400 hundreds shops, therefore, each shop may have 2 to 3 pages of items (each page shows max 12 items).

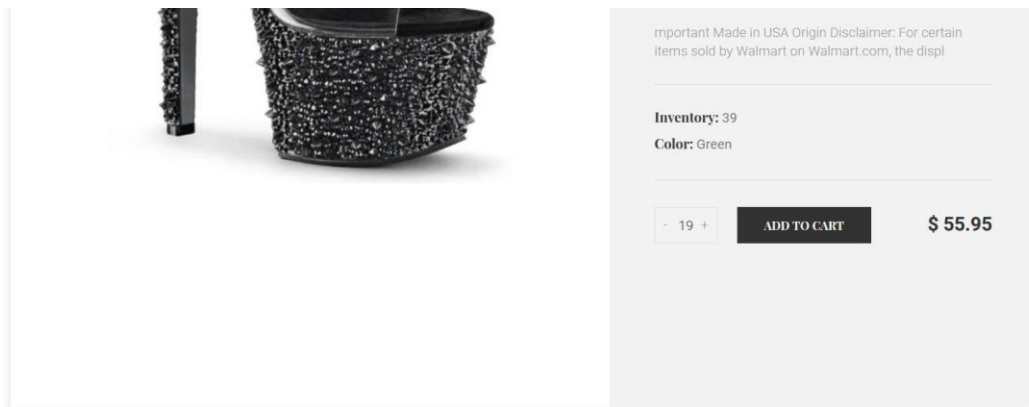
Product-right:

The menu bar has same content with Shops page.



This is the page that shows more details of the product. You will be directed to this page when clicking an item’s name or its picture at previous page (the shop-indi). The title is the product name, and underneath the title, is a link going back to the original shop (unfortunately, back to first page); underneath the link, is a short description of the item. If you scroll down a little bit, there should be a big picture of that item (sometimes it maybe a very small one,

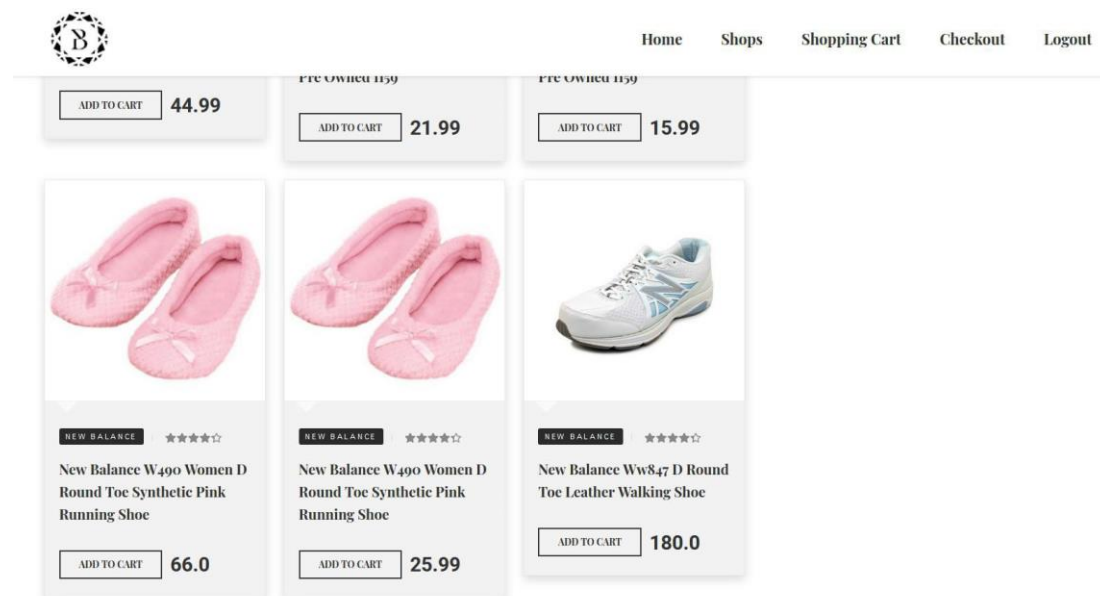
depends on the data). on the right, there is the name and description for that item again. And down a little bit, you can see the inventory of that product, remaining you to buy it soon.



There is also an “add to cart” button, but this time, it allows you to choose more than one of this product. You can choose more than inventory value, because you will have to first pay for it, and it is up to the seller to manage whether he/she will accept it or not.

Product-list:

The menu bar has same content with Shops page.



(a search on New Balance)

If you suddenly wants some item while looking at previous page (the page for a specific item), you can also click the magnifying glass at top right corner, which has the same searching function as the one at main page.



Search

Search...

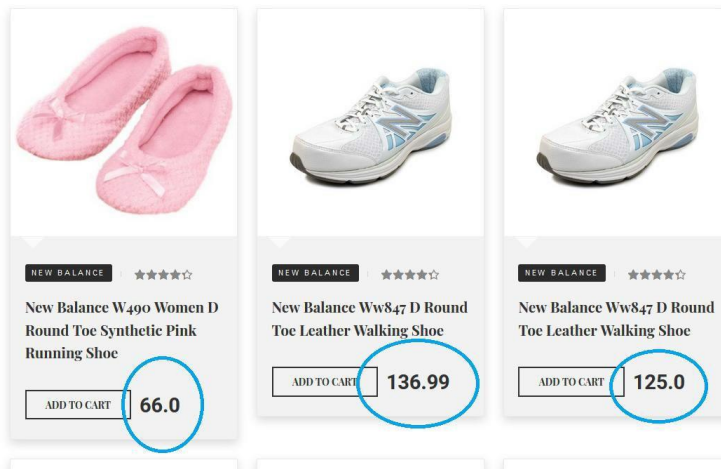
Price Filter

Drag slider to change the price range

\$ 58

\$ 141

FILTER



After doing the search, you get a similar view on the items. While you cannot further limiting your key words by using the search box (it will do another search for what you have typed in), you can use the price filter to filter out the price you do not want. You can page through the entire search results with price filtered out consistently.

Shopping cart:

The menu bar has same content with Shops page.



Cart

[HomePage](#) / [Shop](#) / [Cart](#)

[Shopping Cart](#) > [Checkout](#) > [Order Complete](#)







Product	Price	Quantity	Subtotal	
---------	-------	----------	----------	--

[Countinue Shopping](#)

[Proceed to Checkout](#)

(empty cart, you can still proceed checkout, no problem~)



Product	Price	Quantity	Subtotal	
 At vero eos et accusam Color: Silver Brand: Gotta Flurt	\$44.99	<input type="text" value="7"/>	\$44.99	
 At vero eos et accusam Color: Blue,Navy,Gray Brand: Dr. Scholl's	\$50	<input type="text" value="7"/>	\$50	
 At vero eos et accusam Color: Brand: Nine West	\$12.99	<input type="text" value="75"/>	\$194.85	

[Continue Shopping](#)

[Proceed to Checkout](#)

You will see all the items in your shopping cart, including their quantities and subtotals. You can delete an item.

After the subtotal table, you will see discount codes and shipping tax box, we do not have time to implement these functions.

Checkout:

The menu bar has same content with Shops page.



Billing Address

First Name *	<input type="text"/>
Last Name *	<input type="text"/>
Address *	<input type="text" value="Street address"/> <input type="text" value="Apartment, suite, unit etc. (optional)"/>
Town / City *	<input type="text" value="Town / City"/>
County	<input type="text" value="State / County"/>
Postcode *	<input type="text" value="Postcode / Zip"/>
Phone *	<input type="text"/>

Your order

Product
Women's Gotta Flurt Swerve Silver Sequin/Synthetic by Gotta Flurt × 1
Women's Dr Scholl's, Pacific Slide Sandal × 1
Nine West Carlacay Women Open Toe Leather Platform Heel × 15
Shipping:
Total:

The checkout page requires you to fill in the form for your shipping address. If you have purchased any thing before, at bottom of the form when you are entering your payment card number, you can choose which card to use by their nick names by checking the check box.

Postcode *

Phone *

Payment method ☐ using card 1 ?
☐ using new card

Card number *

Card Nick Name *

Place order

The default nick names we generated are just “card 1”, “card 2” and “card 3”. It will remember your card nick name when you come to check out next time.

Your order

Product	Total
Totes Isotoner Size Xlarge Womens Embroidered Terry Ballerina Slippers, Periwinkle Blue x 1	24
Born 9699 Womens Gray Suede Ankle Lined Riding Boots 10 Medium (b,m) Bhfo x 2	102
Shipping:	Free Shipping
Total:	\$126

On the right side, it shows you the sub total price for each item, and total price for the entire purchase.




Thank You!

[HomePage](#) / [back to shop](#)

When you click checkout, a simple “Thank you” page shows up. Beneath the “Thank you” title, you can click “back to shop” to go back to your previously visited shop, or click “HomePage” to go back home page. Note that, you can always go back to home page by clicking the logo.

Data Entry:

 Hello aaaa  

[Home](#)

[Shops](#)

[Add Item](#)

[Logout](#)

If you are the operator of a shop, you will see a red “Add item” at the menu bar when you visit your shop.

item name: *

brand: *

color: *

description: *

price: *

inventory: *

image: *

未选择文件。

Clicking it will allow you to enter a page, which is basically a form. You can insert one item at a time, and one image per item (we know it is not a very mature functionality).

Bulk loading is specific for web manager, shop operators should not have that right to exploit the entire database. The entry is at the top of main page, you can see it when you login as an admin (with specific user name and password).

Load SQL file

HomePage / back to shop

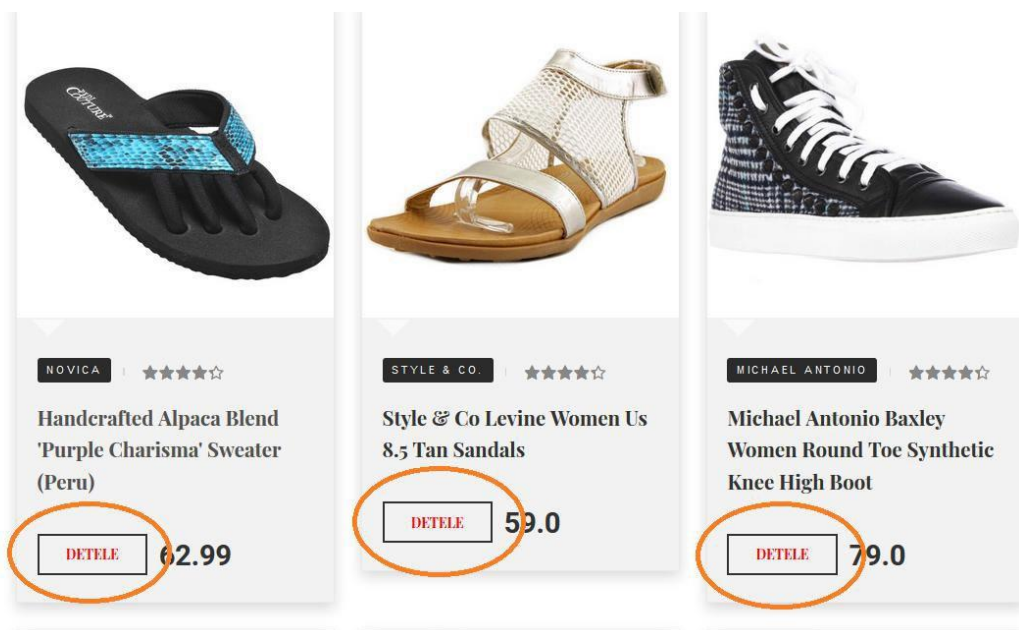
sql: *

浏览... 未选择文件。

upload

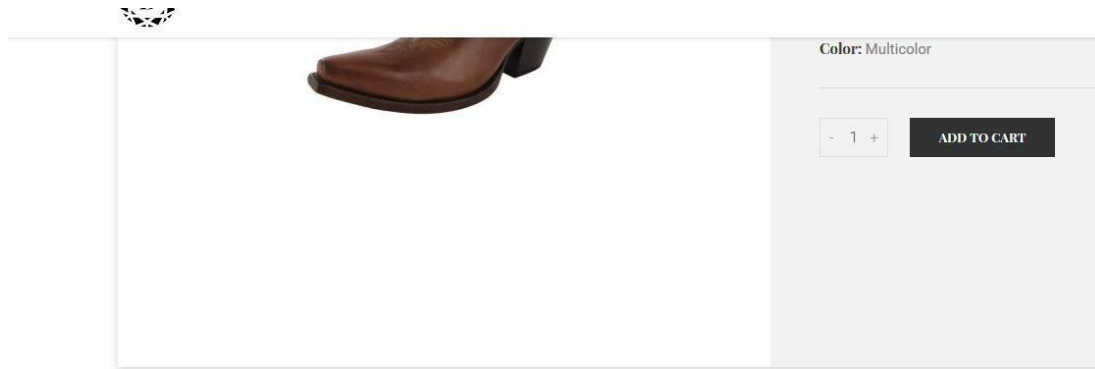
Clear Form

when you click it, you are directed to a simple page, allows you to upload a .sql file to make any change to the database remotely. You will see error if you make any mistakes on that .sql file. You will only see a simple “Success” if nothing went wrong (bulk loading cannot be used practically as a query method).



Additional to adding things, shop owner and admin can also delete items. It is ok for them to do searching, which is exactly the same as they do like a normal user. However, shop owners cannot buy its own items, the “add to cart” button becomes “delete”, which will permanently delete the record from the database. On the other hand, while admin also have the “delete” button, it will only change the status of that item. It is up to shop own’s decision to delete it permanently or not. Items that are “deleted” by admin are no longer visible to normal users, which will be explained again later. Finally, admin can “delete” any item he/she finds; and admin

cannot buy anything.



		delete
update name:	Bernie Mev. Halle Women U	update
update brand:	Bernie Mev.	update
update price:	80.0	update
update color:	Multicolor	update
update inventory:	43	update
update description:	important Made in USA Orig	update

Additionally (again), shop owners can update individual items (not the picture) in their shops. They can do this by clicking an item, going to the item page. Under the big picture of that item, there are several forms, each with one field and one button. You can update whichever field (again, not picture).

Data base tables:

We did not utilize all tables from stage 2, otherwise, we will not have time to finish this program. The tables are as follows:

table name:	Number of entries	Index on primary key	Used Secondary index
User	10100	Yes	yes
Shop	500	Yes	No
Item	10100	Yes	Yes
Contain	10100	No (data are sorted)	No
Normalitem	10100	Yes	No
Orders	14000	Yes	No
Paymentmethod	10100	Yes	No

We obtain our item data from Kaggle <https://www.kaggle.com/datafiniti/womens-shoes-prices> Which contained over 30000 entries. We chose 1/3 of them, and parsed the data into the form we wanted (a lot of work...). We believe the items are the key for a ecommerce website, other data are rather trivial and random in their nature. Therefore, we faked all other data. However, shop names look very reasonable, thanks to many online business name random generators (After all, naming a shop is seemingly a random process for people who are not participating).

Bonus features:

1. We used pictures as a way to present and guide users on our website. Users can go see the detail of an item by clicking on the picture of that item.

2. We have 6 tables with more than 10000 tuples as shown above.

3. We have user authentications. A power user is the web administrator, it can do anything to the database through the bulk loading interface (by writing any .sql file he/she wants). It can change the status of any item permanently, making that item invisible to normal users. A regular viewer, the shop owner, can see what is marked “deleted” by the power user, web admin. However, there is a little difference, because the shop owner is the one who can delete the item permanently (admin can also delete that item using bulk loading interface). The reason is that, we believe the shop owner should have the right to know which item went wrong before it is actually deleted. We do not hope the shop owner find items mysteriously missing without having any clues. Therefore, we think it is reasonable to allow the regular viewer, the shop owner, to delete a no longer visible item in our case specifically. The restricted users, who are neither web admin and shop owner, can only see items with specific status.

We provide simple username and password for three types of users:

Role	Username	Password
Web admin (power user)	root	11111111
Shop owner (regular viewer)	aaaa	aaaa
Normal user (restricted viewer)	bbbb	bbbb

4. We have secondary indexes. We have two secondary indexes table “item”, and one for table “user”.

a) For item, the secondary indexes are **Brand and SID**.

We make secondary indexes on “**Brand**” because we want users who know exactly what brand they want to look at a faster search time. A typical time to search a brand without index is about 8ms; with the index, the search time is 1-2 ms, for example, {8432:1890, 7853:1582, 7610:1429}. There is improvement, which is important if more data are loaded into our database.

The query we used:

```
Select * from item natural join normal item
where item.status = 'display' and item.Brand = ?; [query_brand] (for restricted viewer)
Select * from item natural join normal item
where item.Brand = ?; [query_brand] (for power user and regular viewer)
```

b) We also make secondary indexes on “**SID**”, because if users are not searching for items, they are accessing items by shops, if they are interested, they can also jump from a item page to its shop page. Without index, querying all items from shop (to allow pagination) needs 22 - 24 ms; with the secondary index, it only takes 2 - 3 ms, which is significant improvements. {24698:2385, 22894:2581}. It certainly has something to do with our data. The items SID are not sorted, which is reasonable and reflects the truth.

The query we used:

```
Select * from item natural join normal item
where item.status = 'display' and item.SID = ?; [query_sid] (for restricted viewer)
```

Select * from item natural join normal item
where item.SID = ?; [query_sid] (for power user and regular viewer)

c) We created index on **“username”** in user, which is reasonable, because every user logs in by its username, yet username are usually combination of characters and numbers. However, creating secondary index does not seem to improve performance, rather, seemingly slightly worse. Without index, the general accessing time is 0.3 - 0.4 ms; with secondary index, the time goes slightly up about 0.05 ms. We still think adding this is important, because 10000 users are obvious too small for a website nowadays, and sorting 10000 small tuples (the optimization choice a database would do according to cowbook during no index search) is easy for a modern computer to do.

The query we used:

Select * from user where username = ?; [query_username]

Note: we ran our tests on SSD computers (unfortunately we do not have hard drive computers), so the time might be faster if the test is repeated on a hard drive computer.

Lastly, Thank you for your patience finish reading this report!

Final add:

To redeploy our application on GCP, use the following tutorial to set up platform configs(app.yaml etc.) in root directory.
<https://cloud.google.com/python/getting-started/hello-world>

After setting up the environment, it should be ok to run after deploying the app.