COMP3421 Web Application Design and Development

Final Project Report

Pet Online Shop

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Number of Group member: 1

Part: Front-end

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Abstract

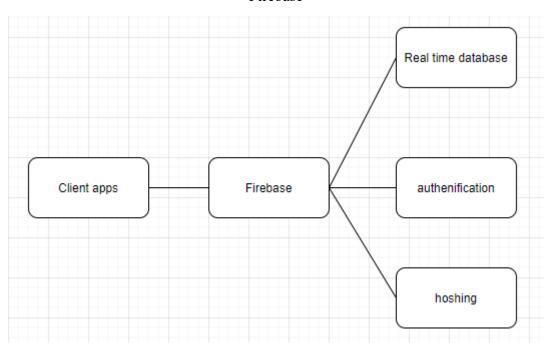
My project is a pet online shop website. This website allows customer buy pet products over the internet. My website design is responsive, therefore our users can visit my website through smart phone either or computer screen as well. The link of my website: https://pet-shopping-20028987d.web.app/. Basic features of the website:

- Login/logout
- Register account
- Setting user profile
- View items
- Filter/Search items
- Shopping cart
- Checkout

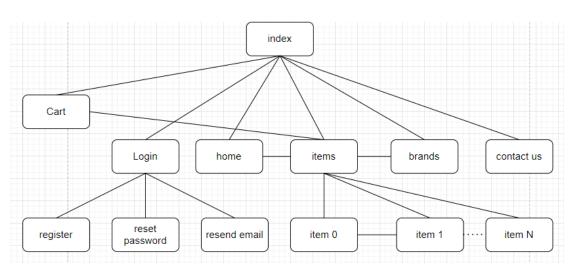
- View payment records
- Contact our company

System Structure

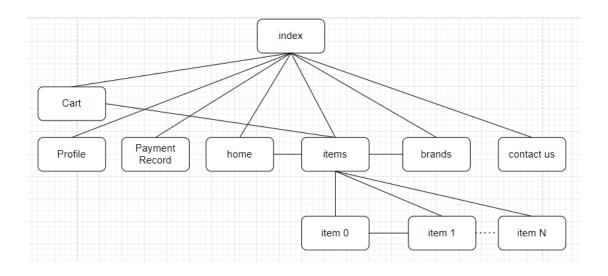
Firebase



Guest



User



The components of the system and their

functionalities

Register Page: https://pet-shopping-20028987d.web.app/register.html

(See appendix 1)

Name	Туре	Functionalities
Login now	Link	Go to login page
Sign up	Button	Check whether the
		sign up form is valid.
		• Submit the sign up
		form if the sign up
		form is valid.
		• Store the register
		information to the
		database.
Sign up form	Form	Input required register
		information.
		Input:
		• Full name
		• Email
		Password
		 Confirm Password
		Birthday
		Phone Number

	Gender

Login Page: https://pet-shopping-20028987d.web.app/login.html

(See appendix 2)

Name	Туре	Functionalities
Login Form	Form	Input required login
		information.
		Input:
		• Email
		Password
Login	Button	• Check login form's
		validatility
		Check whether the
		user is already login.
		• If the form is valid,
		check whether the
		email and password
		is correct.
		Check whether your
		email had verified.
		If the email and
		password is correct
		and the email was
		verified, then alert
		the user "Login
		success", then
		redirect to
		homepage.
Create One	Link	Go to register page
Reset Password	Link	Go to reset password page
Resend Email	Link	Go to resend email page

 $Reset\ Password\ Page:\ \underline{https://pet-shopping-20028987d.web.app/reset_password.html}$

(See appendix 3)

Name	Туре	Functionalities

Email input	Input	Input the user email
Send	Button	• Check the user
		record that whether
		the email is valid.
		Send the reset
		password to the
		email that the user
		provided if the email
		is valid, then go to
		login page.

Resend email page: https://pet-shopping-20028987d.web.app/resend_email.html (See appendix 4)

Name	Туре	Functionalities
Resend email form	Form	We require the correct
		email and password for
		resending the verification
		email.
Send	Button	Check whether the
		email and password
		are correct.
		Resend verification
		email if the email
		and password are
		correct.

Index Page: https://pet-shopping-20028987d.web.app/index.html

Index page is a combination of navigation bar and the content pane. The content of content pane can be change to: Cart page, home page, items page, item [0...n] page, brands page, contact us page, profile page and payment record page. Also, we have the scroll back to top button to helps user scroll back to the top of our page.



Navigation bar

(See appendix 5)

Name Type State Functionalities

Login	Button	Before login	Go to the login page.
Cart	Button	Before and after	Go to the cart page.
		login	
Home	Button	Before and after	Go to the home page.
		login	
Items	Button	Before and after	Go to the items page.
		login	
Brands	Button	Before and after	Go to the brands
		login	page.
Contact us	Button	Before and after	Go to the contact us
		login	page.
Search	Input	Before and after	Go to the items
		login	page and show
			the search results
			simultaneously.
			• User can search
			by the id, name,
			price, sale date,
			quantity, sale
			quantity, brand
			id, brand name,
			animal type of
			the item.
My account	Dropdown button	After login	Drop items:
			• Profile: go to
			profile page.
			• Payment record:
			Go to payment
			record page.
			Logout: logout
			and redirect to
			login page.

Home page

(See appendix 6)

Name	Туре	Functionalities
Carousel	Carousel	Show the 3 newest items
Types of items	Pictures with buttons	Click the shop now button

		will go to the item page
		with filtered by that item
		type. It can be cat, dog,
		small animal or toy.
Features of my shop	Icons with text	Show the features of my
		shop.

Items page

(See appendix 7)

Name	Type	Functionalities
Results	Text	Show how many results
		return
#items per page	Dropdown buttons	Choose how many
		maximum results display
		on each page, it can be
		25,50 or 100.
Sort by	Dropdown buttons	Choose how to sort the
		results, it can be
		• Default = sort by id
		Availability =
		quantity of item > 0
		• Latest
		• Popularity = sort by
		sale quantity
		• Price: low to high
		• Price: high to low
Reset All	Button	Reset the filter
Collapse All	Button	Collapse the filter
Expand all	Button	Expand the filter
Price filter	Range[low,high]	User can choose the low
		bound and upper bound of
		the item's price. And click
		the filter button to execute
		the price filter
Type filter	Accordion with multiple	Filter by types, or sub-
	checkboxes	categories of types.
Item	Item	Show the basic
		information of an

		item.
		• Add to Cart button:
		add this item into
		cart.
		• Click item will go to
		that item page.
Pagination	Pagination	indicate a series of related
		content exists across
		multiple pages.

Brands page

(See appendix 8)

In brands page, it lists out all the brands, user click the brand will go to items page and the items result is filtered by that brand.

Contact Us page

(See appendix 9)

Name	Туре	Functionalities
Contact us form	Form	Allow user send
		message to our shop.
		• This form requires
		user input: name,
		title, email and
		message.
		• Send: a button to
		send message to our
		shop.
Contact us information	Text	Shop the email address
		and office hour to the
		user, so that it provides
		different ways to user to
		contact us.

Item [0...n] page

(See appendix 10)

Name	Туре	Functionalities
Previous item	Button	Go to previous item page

Next item	Button	Go to next item page
Item information	Text	Show the information of
		the item including:
		Photo
		● Id
		• Price
		• Brand
		Sale date
		Quantity
		Sale quantity
		● Type
Add Cart	Button with number input	The number input
		represents add how
		many quantities of
		that item into cart.
		• The add cart button:
		add that number of
		quantities into cart.
Comments	Text	Show the users comments
		including comment and
		comment date.
Order by	Dropdown button	Change the comments
		order: latest to oldest or
		oldest to latest.
Your comment	Textarea	Allow user inputs their
		comment.
Add comment	Button	Add user comment.

Cart Page

(See appendix 11)

Name	Type	State	Functionalities
Continue Shopping	Button	Cart item = 0	Go to items page
Cart table	Table	Cart item > 0	List what items into
			cart.
			Column of the table:
			• #
			• Id: item's id
			• Item: item name

Quantity	Number input	Cart item > 0	 Price: item price Quantity: item quantity Total price: item x quantity Delete all: delete all items in cart. Change the item quantity. Minimum =
			1.
Delete	Button	Cart item > 0	Delete that item in cart.
Price information	Text	Cart item > 0	Show the price information. Total price: sum of the total price Account wallet Remain wallet: account wallet – total price.
Shipping address	Text	Cart item > 0	Show the shpping address.
Google map api	Google map api	Cart item > 0	There are 7 shipping address that user can select.
Checkout	Checkout	Cart item > 0	 Check whether remain wallet >=0. If remain wallet >=0, checkout success, and clear the cart and go to items page.

Profile page

(See appendix 12)

Name	Туре	Functionalities
Profile form	Form	Readonly form that shows

		user information	
		including	
		• Full name	
		Birthday	
		• Phone number	
		• Gender	
		 Account wallet 	
Setting	Button	Change form to be not	
		readonly.	
Reset	Button	Reset the form	
Save	Button	Save the form input.	
Add price	Button	Open the add price model.	
Add price model	Model	Allow user inputs the key	
		to increase price into the	
		account.	

Payment record page

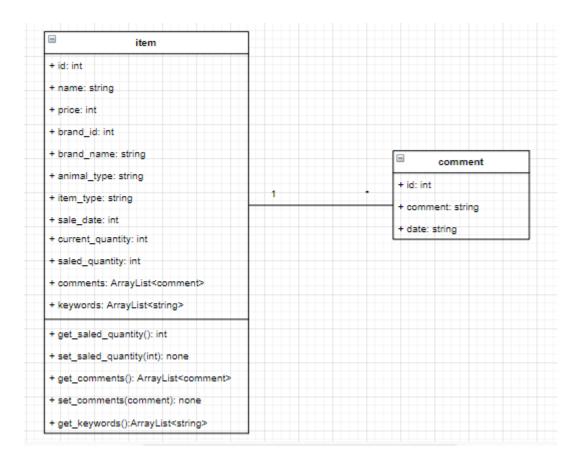
(See appendix 13)

In this page, it shows all the payment record.

Class Diagrams

Item

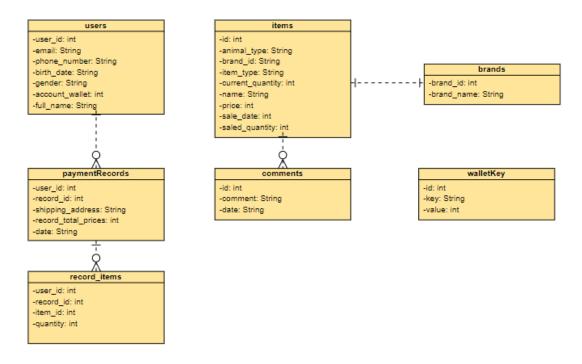
The item class is used to generate items.



Database

We use a JSON document database to stores the information of the customers and the pet items.

The structure of the database



Relationships between tables

- One user can have many payment records.
- One payment record can contain many items.
- One item can have many user comments.
- One item only has one brand.

Tables

- Users table stores the information about the users.
- paymentRecords table stores the payment records of each user.
- record items table stores what items that the users bought in each record.
- Items table stores the information about the items
- The comments table stores the comments of each item.
- brands table stores the brand id and the brand name for selecting different brand items.
- walletKey table stores different key and its value for adding money in user digital wallet if the user has the key. The key will be discarded after the key was used.

Security

Password Entropy

Password must contain at least one number and one uppercase and lowercase letter, and at least 8 or more characters. Allowable special characters:

~! @ # \$ % ^& * () _ + | ` = { } [] : "; ' <> ?, . Therefore, the password entropy is $\log_2((26 + 26 + 10 + 32)^8) = 52.43$ bits. The password entropy is higher, then the attacker takes more time to do brute force attack.

Authentication

The server stores the hash value of the password of the user rather than the server stores the password of the user. Therefore, if the attacker attacks the server successfully, he just can obtain the hash value rather than the password and he cannot recover the password from the hash value.

Email Verification

After the users register their account successfully, they need to verify they are the email owner before they login. Otherwise, they cannot login. The verification method is sending the verification email to their email address. They need to click the link in verification email to verify themselves. Because I assume only the email owner has his/her email account.

HTTPS

HTTPS is a HTTPS with encryption. HTTPS uses TLS (or SSL) to encrypt HTTP requests and responses. In our website, all HTTP requests will automatically redirect to HTTPS. For example, when you enter https://pet-shopping-20028987d.web.app/. to the browser, the you will get the response of https://pet-shopping-20028987d.web.app/.

Programming languages and tools used

HTML

- CSS
- Javascript
- Bootstrap
- JQuery
- Firebase Authentication
- Firebase Realtime Database
- Firebase Hosting
- Google Maps JavaScript API
- EmailJS JavaScript API

Testing Strategies and results

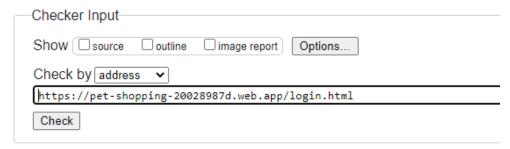
The W3C Markup Validation Service

• Address: https://pet-shopping-20028987d.web.app/



The error is incorrect. Attribute onsearch is allowed on element input at this point.

Address: https://pet-shopping-20028987d.web.app/login.html
 Showing results for https://pet-shopping-20028987d.web.app/login.html



Document checking completed. No errors or warnings to show.

Used the HTML parser. Externally specified character encoding was utf-8. Total execution time 391 milliseconds.

No error.

• Address: https://pet-shopping-20028987d.web.app/register.html

Showing results for https://pet-shopping-20028987d.web.app/register.html

Checker Input
Show ☐ source ☐ outline ☐ image report ☐ Options ☐
Check by address V
https://pet-shopping-20028987d.web.app/register.html
Check

Document checking completed. No errors or warnings to show.

Used the HTML parser. Externally specified character encoding was utf-8. Total execution time 315 milliseconds.

No error.

• Address: https://pet-shopping-20028987d.web.app/reset_password.html

Showing results for https://pet-shopping-20028987d.web.app/reset_password.html

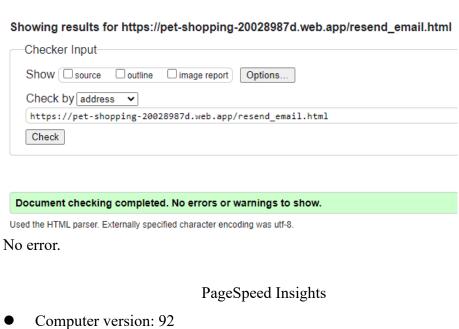
-Checker Input-
Show source outline image report Options
Check by address v
https://pet-shopping-20028987d.web.app/reset_password.html
Check

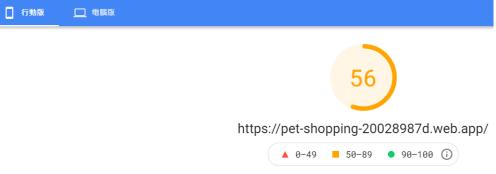
Document checking completed. No errors or warnings to show.

Used the HTML parser. Externally specified character encoding was utf-8. Total execution time 275 milliseconds.

No error.

• Address: https://pet-shopping-20028987d.web.app/resend_email.html





Manual Test

Improvement

PageSpeed

• Resize these images to save data and improve page load time.

- Use JPEG 2000, JPEG XR, and WebP formats rather than JPEG and PNG formats because JPEG 2000, JPEG XR, and WebP are image formats that have superior compression and quality characteristics compared to their older JPEG and PNG counterparts.
- Minifying JavaScript files can reduce payload sizes and script parse time.

Testing Strategy

Test automation rather manual testing. Jest is a delighting javascript testing framework. We could use Jest to do a unit test to make sure our function is performed what we expected.

Payment methods

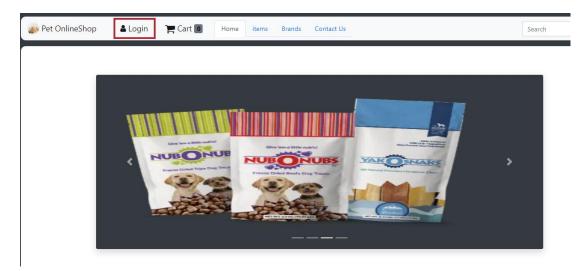
Currently, my website only provides one payment method which is paid by account wallet. We could add more payment methods for user friendliness such as paypal pay, google pay and credit-card payment. These types of payment methods are most popular in the world nowadays. We should add the payment methods to increase the convenience of payment.

User Manual

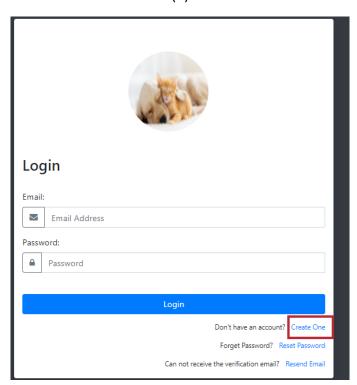
Introduction the main function of the pet online shop.

Registration:

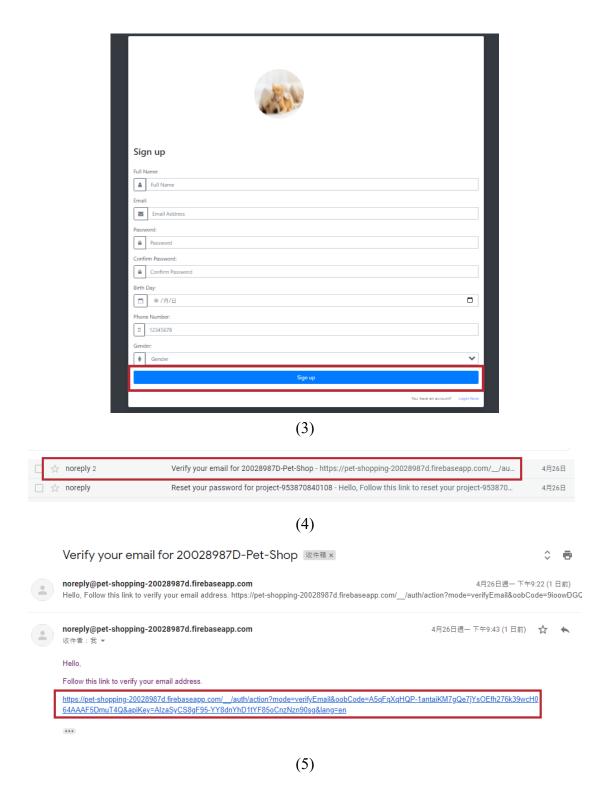
Click on the button "Login"(1). This will take you to login page. Then, click on the link "Create one"(2). This will take you to register page. In the register page, fill in the register form, then click on the button "Sign up"(3). Noted that password must contain at least one number and one uppercase and lowercase letter and one special character, and at least 8 or more characters. Finally, go to your email, open the verificaition email(4) and click on the link to verify your email address(5).



(1)

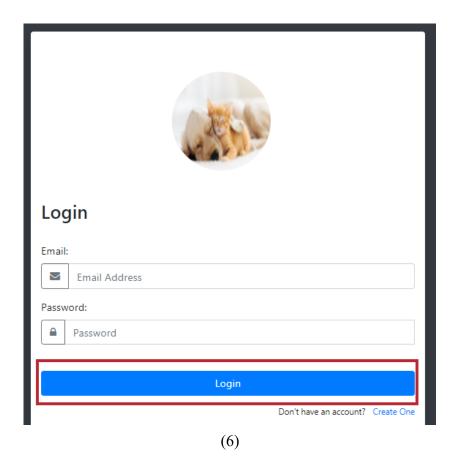


(2)



Login:

After the registration, it will automatically go to login page. Fill in the email address and password, and then click "login" button to login (6). If login success, it will go back to the index page.

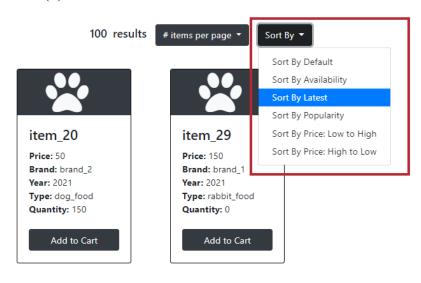


Search:

There are many ways to search the items.

• Sort by

Th items can sort by id, availability, latest, popularity, price: low to high, price: high to low (7).



(7)

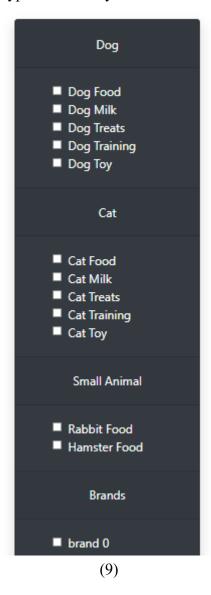
• Filter by price

You can also filter the price range of the items. Narrow the range of the bar will narrow the price range. Click the filter button will execute the filter (8).



Types

You can select different types of items by click these checkboxes (9).



• Input search

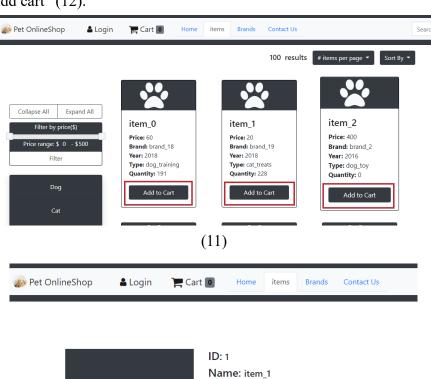
Also, you can type the keyword into the input search (10). It will search whether

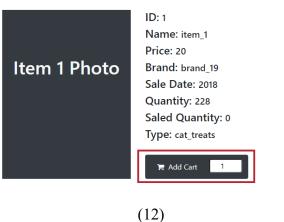


Cart:

• Add item into cart:

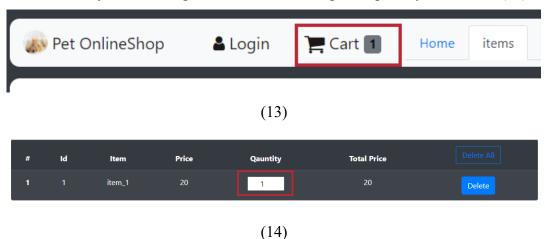
There are 2 ways to add item into cart. The first way is in the items page, click the button "Add to Cart" (11). The second way is in the specific item page, click the button "Add cart" (12).





• Change the quantity of the item

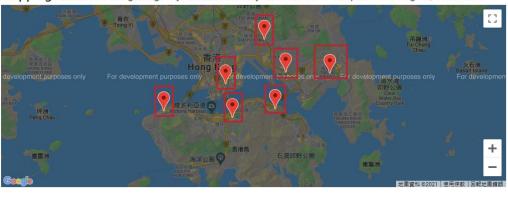
First, you go to the cart page by click the "Cart" button on the navigation bar (13). Then, in the cart table, there has a column call "Quantity", there have a number input in that column, you can change that number to change the quantity of the item (14).



Change Shipping Address

There are 7 shipping addresses provided to user select where they collect the items they bought. You can click the red icon in the map to change the shipping address (15).

Shipping Address: Hong Kong Polytechnic University West Kowloon Campus 9 Hoi Ting Rd, Yau Ma Tei

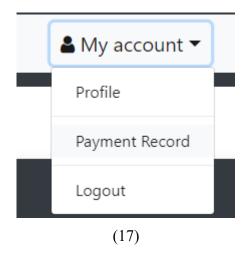


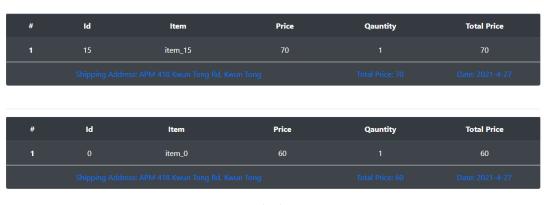
(15)

Checkout

Click the "checkout" button to checkout (16). You can see the result in payment record (17)&(18).







(18)

Application Installation Guide

The website is already deployed by using Firebase. The deployed website link is as follow:

https://pet-shopping-20028987d.web.app/

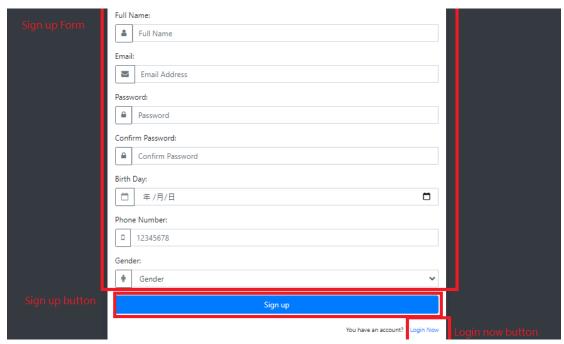
Description of the role each member played in the

group

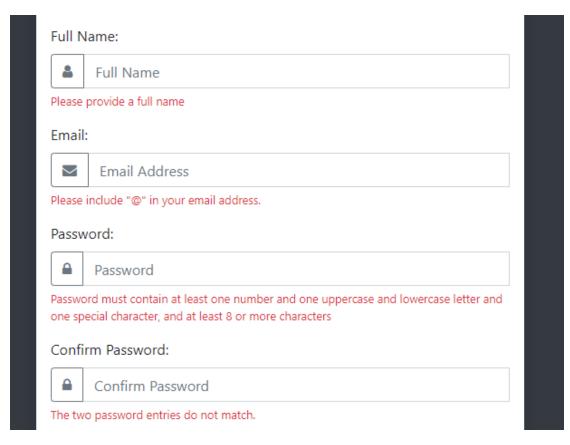
Member	Role	
Yiu Kam Wing	All	

Appendix

Register Page (appendix 1)



Invalid Sign up



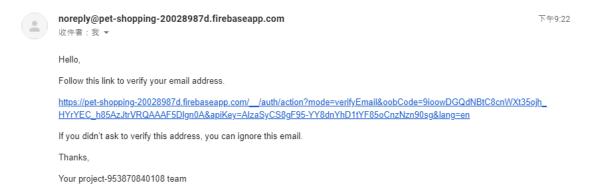


Sign up success



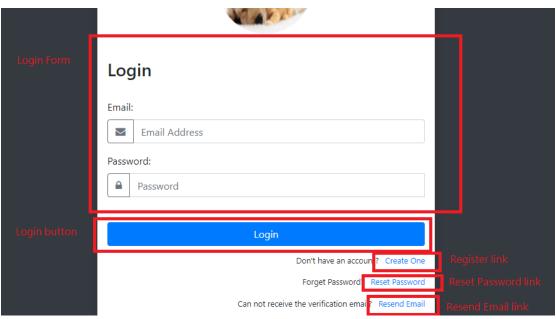
Email verification

Verify your email for 20028987D-Pet-Shop 收件箱×



Your email has been verified You can now sign in with your new account

Login Page (appendix 2)

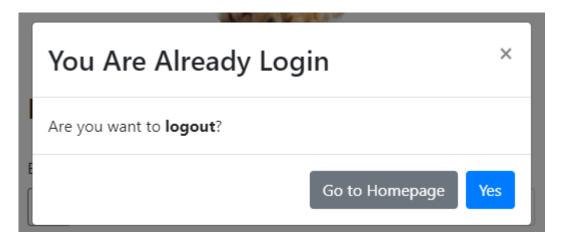


Invalid Login





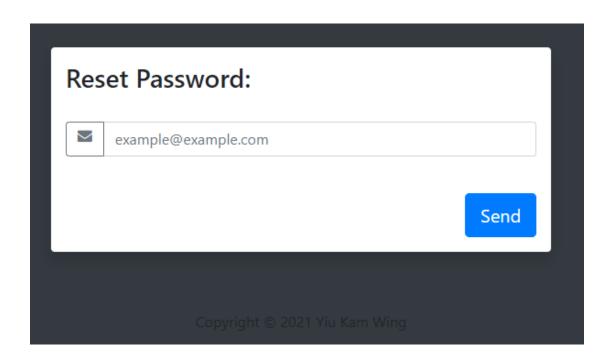
Already Login



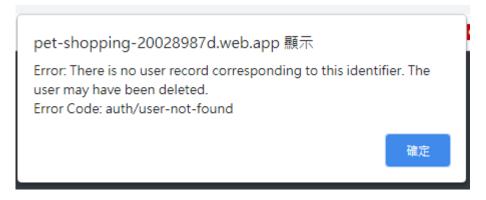
Login success



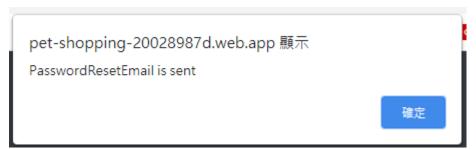
Reset Password (appendix 3)



Invalid email

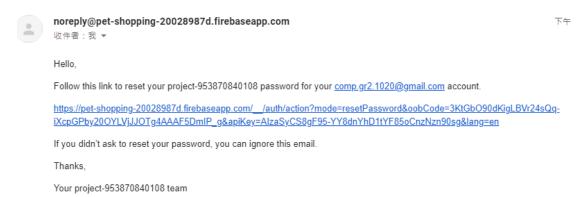


Valid email

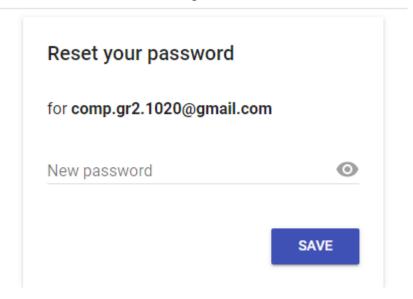


Reset password email

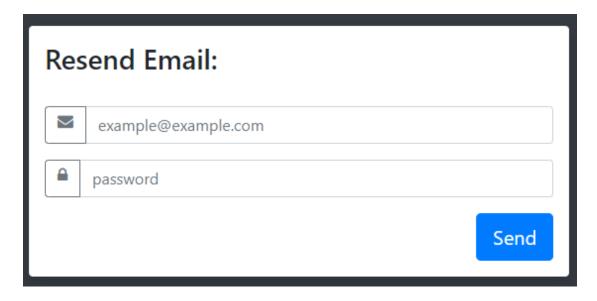
Reset your password for project-953870840108 收件箱×



Reset password



Resend verification email (appendix 4)



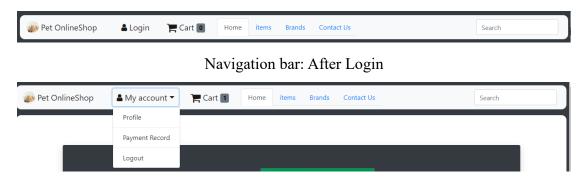
Invalid email



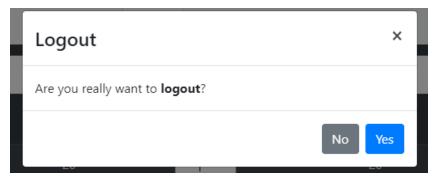
Valid account



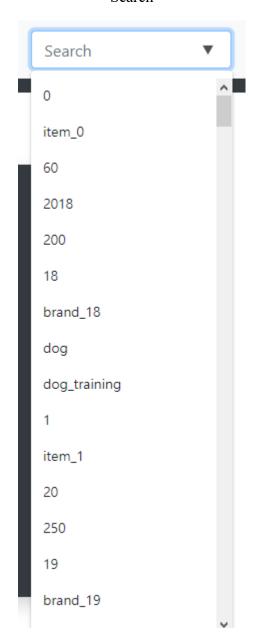
Navigation bar (Appendix 5) Navigation bar: Before Login



Logut



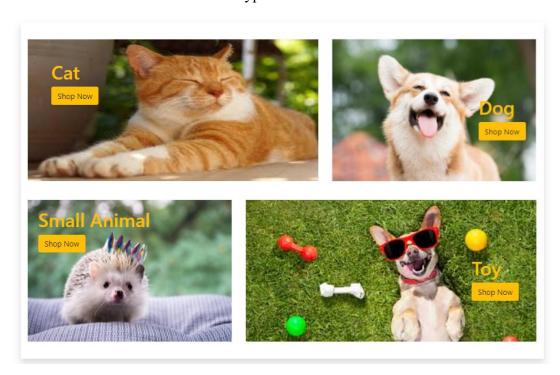
Search



Home page (Appendix 6) Carousel



Types of item



Features of my shop

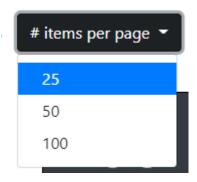


Items page (appendix 7)

Results

100 results

#items per page



Sort by



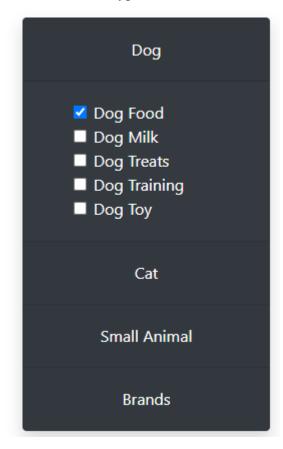
Reset all, Collapse all, Expand all

Reset All				
Collapse All	Expand All			

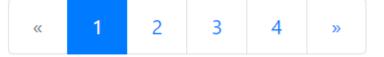
Price filter



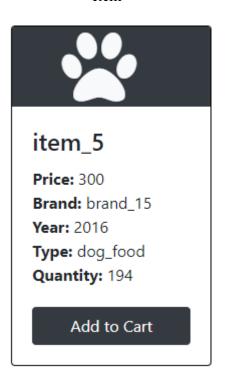
Type filter



Pagination



Item

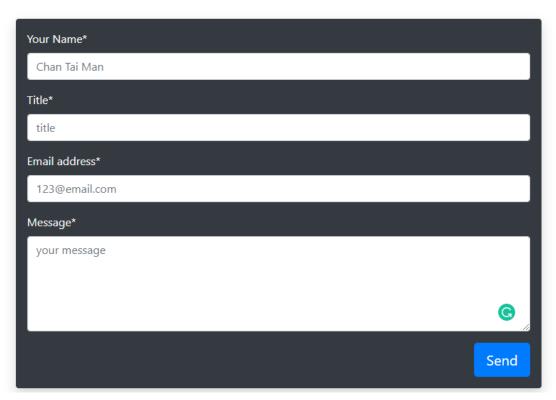


Brands page (appendix 8)



Contact Us page (appendix 9)

Contact Us form



Email sent successfully



New message in pet online shop from test 收件厘×



comp3421 pet online shop <comp3421petonlineshop@gmail.com> 寄給 我 ▼

Pet online shop got a new message from test:

Sender: test

Title: testing

His/Her Email: comp.gr2.1020@gmail.com

Message: test

Contact information

Contact Info

EMAIL: comp3421petonlineshop@gmail.com

OFFICE HOUR: Monday to Friday 9am to

6pm

Item [0...n] page (appendix 10)

Previous item, next item

« Previous Item

Next Item »

Item information, add cart



ID: 1

Name: item_1

Price: 20

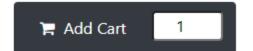
Brand: brand_19

Sale Date: 2018

Quantity: 228

Saled Quantity: 0

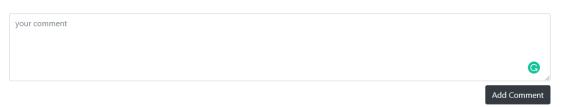
Type: cat_treats



Comments, order by



Your comment, add comment



Cart page (appendix 11)

Continue Shopping

Your Shopping Cart is Empty!

Continue Shopping

Cart table



Price information

Total Price: \$530

Account Wallet: \$140

Remain Wallet: \$-390

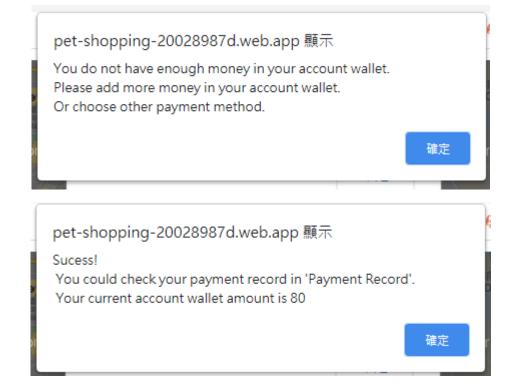
Shipping address, google map api

Shipping Address: Decathlon Tseung Kwan O MTR: Exit C, 3/F, TKO Spot, 2 Tong Ming St, Tseung Kwan O



Checkout

Checkout



Profile page (appendix 12)

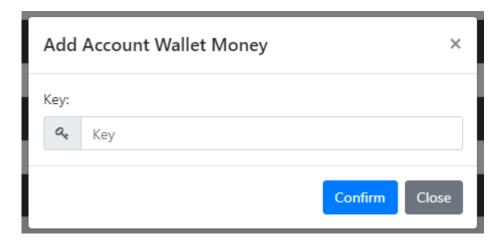
Profile form



Reset, Save



Add price model



Payment record page (appendix 13)

#	ld	Item	Price	Qauntity	Total Price
1	15	item_15	70		70
Shipping Address: APM 418 Kwun Tong Rd. Kwun Tong			Total Price: 70	Date: 2021-4-27	

#	ld	Item	Price	Qauntity	Total Price
1		item_0	60		60