COSC2299 Software Engineering: Processes & Tools
Software Requirement Specifications
BrokieHub

Group P3 Number 8
Tutorial: Thursday 4:30pm

GitHub Repository: **https://github.com/cosc2299-sept-2023/team-project-group-p03-08**

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Introduction

Purpose

SuperPrice is a web application for comparing grocery items between different stores. The website aims to streamline the shopping experience to make it more pleasant for shoppers. By removing the need for them to navigate several websites to search for the lowest price on the same product. The website will also be beneficial for storeowners (assuming they offer the lowest price) as it will bring customers to purchase their products.

It would achieve this by interpreting data from an assortment of databases and presenting the item the user desires at a given location for a price, along with any discounts or deals. The data received from the databases for any given item would be presented nicely in a web page. This web page would also include a suggested display for identical products with pricing from other store locations, along with a graph to display the historical pricing of a given item.

Stakeholders

The client is a key stakeholder, being the person who commissioned us for this work and thus is the most invested in the success of the project. He will be the primary representative of the customer base we are developing the project for, but not necessarily the only customer we design for. As such, the client will be working closely alongside us and integrated with the development process as part of the Agile methodology.

Another stakeholder is the developers working on the product, who are directly responsible for the outcome of the project. The project will be developed under the Agile methodology and as such the team must keep up with the workload to see a successful project.

An external stakeholder that can affect the success of the project is the supermarkets from whom the developers will be sourcing the data from. The reliability and accessibility of any database APIs or other methods of sourcing data will directly influence the reliability of our project and as such, any major hinderances is liable to also cause issues in the project's development cycle.

Functional Requirements

- **Compare Different Prices**: Enable users to simultaneously view and contrast the prices of multiple products.
- **Order a Delivery**: Allow users to schedule the delivery of all items in their cart seamlessly.
- **Notifications**: Implement a system that sends various notifications to users as needed.
- **Product Search**: Facilitate the search for specific items through an efficient and effective search function.
- **Categorizing Products**: Provide the ability for users to filter items by category, enhancing discoverability.
- **Login System**: Implement a secure user account creation process for purchasing items.
- **Search Filters**: Include search filters to aid users in narrowing down product selections.
- **Pricing History**: Enable users to view the historical pricing data of products.

Non-Functional Requirements

- **Legal (Security)**: Ensure compliance with relevant legal regulations to maintain security and privacy.
- **Alcohol Age Limit (Security)**: Implement age verification for purchasing age-restricted products.
- **Font Size (Usability)**: Allow users to adjust the font size on the webpage for readability.
- **Website Navigation (Usability)**: Design the website to enable easy navigation and price comparison.
- **24/7 Availability (Reliability)**: The website should be accessible for use 24 hours a day.
- **Themes (Usability)**: Incorporate customizable themes to enhance the user experience.

Key Features

o Product Search and Categorization: The application will provide a comprehensive search feature, allowing users to find specific products or browse through various categories. This functionality will ensure a smooth and hassle-free shopping experience.

o Price Comparison: The SuperPrice application will enable users to search for specific products and instantly compare prices across different supermarkets in the area. Users can easily identify the store offering the lowest price for their desired items.

o Delivery Organization: SuperPrice will facilitate the organization of deliveries for users who wish to have their groceries brought to their doorstep. The application will offer multiple delivery options, including time slots to ensure flexibility and convenience.

o Notifications and Alerts: The application will provide timely notifications and alerts to keep users informed about price drops or exclusive offers. This feature will ensure that users never miss great deals.

o User-Friendly Interface: SuperPrice will boast a user-friendly and intuitive interface, making it accessible to a wide range of users. The application will prioritize simplicity and ease of use, ensuring a seamless experience for both novice and experienced shoppers.

User Stories

Story #1:	**Price Comparison**	**Priority**	High
		Effort	10/10
As a	Customer		
I want	To compare prices between multiple stores		
So that	I can choose the lowest price in a store near me		
Acceptance criteria	Scenario: customer comparing prices for a product with comparisons ❑ Given I am a customer ❑ When I click to view price comparisons of a product ❑ Then the system will return a results page of stores with similar or lower prices Scenario: customer comparing prices for a product without comparisons ❑ Given I am a customer ❑ When I click to view price comparisons of a product ❑ Then the system will return a page without price comparisons for this product		

Story #2:	**Delivery**	**Priority**	High
		Effort	9/10
As a	Full-time worker or student		
I want	To be able to order my groceries online for delivery		
So that I can	Save the time and effort from having to physically go to the store.		
Acceptance criteria	Scenario: full-time worker or student ordering groceries for delivery ❑ Given I am a full-time worker or student, ❑ When I click on the 'Delivery' option after adding items to my cart, ❑ Then the system will send a notification confirming delivery Scenario: Customer orders groceries for delivery and enters invalid address ❑ Given I am a full-time worker or student, ❑ When I click on the 'Delivery' option after adding items to my cart,		

	❑ Then the system will prompt me for a correct delivery address		

Story #3:	**Notifications**	**Priority**	High
		Effort	9/10
As a	Mother		
I want	To be notified of the best deals and price changes		
So that I can	Be informed of making the best decisions that cut costs for my household		
Acceptance Criteria	Scenario: Mother wants to be notified of the best deals ❑ Given I have chosen for deal notifications ❑ When businesses add new deals to their websites ❑ Then the system will send a notification alerting of the new deals available. Scenario: Mother wants to be notified of the price of a specific product ❑ Given I have clicked the notifications button on a product page ❑ When the price changes for this product ❑ Then the system will send a notification alerting of the price change		

Story #4:	**Simple Search Bar**	**Priority**	High
		Effort	8/10
As a	New user		
I want	To be able to search for products in a quick and easy manner		
So that I can	Have a seamless shopping experience despite not having used the system before.		
Acceptance Criteria	Scenario: User searches for a product by key terms ❑ Given I have entered the key terms for my search ❑ When I click the search option ❑ Then all items matching key terms will appear Scenario: User searchers for all products		

❑ Given I have entered no terms in the search bar
❑ When I click the search option
❑ Then all items will appear

Scenario: User search returns no products

❑ Given I have entered the key terms for my search
❑ When I click the search option
❑ and no products match those terms
❑ Then the website displays a message about no matching items

Story #5:	Navigation	Priority	High
		Effort	8/10

As a	New user

I want	To be able to navigate through the website easily

So that I can	Have a seamless shopping experience despite not having used the system before.

Acceptance Criteria	Scenario: A new user is navigating our website for the first time ❑ Given I am a new user on the website ❑ When I look around the website ❑ Then I want to able to figure out what each button/link will do

Story #6:	Categorisation	Priority	High
		Effort	8/10

As a	Browsing shopper

I want	I want products to exist under a category

So that I can	Find the exact products I am looking for by category if I am unsure of what the product is

Acceptance Criteria	Scenario: Customer who is unsure of what exactly they want to search for products
	☐ Given I have selected/searched for the category of products I want
	☐ When I hit the search button
	☐ Then I want to find products under that category
	☐ And find the product I am looking for
	☐ And find products like what I may be looking for

Story #7:	Search Filter	Priority	High
		Effort	7/10
As a	Customer		
I want	To filter for certain stores in my search		
So that	I can only see the prices relevant to me		
Acceptance criteria	Scenario: Customer wants to filter out groceries too far away ☐ Given the customer is on the map feature to search for grocers offering prices ☐ When the customer filters for only grocers within 5km of location ☐ Then the map should only display grocers within a 5km radius Scenario: Customer wants to filter groceries by a specific feature (e.g. Vegetarian or Gluten Free) ☐ Given the customer has selected their desired feature ☐ When the customer selects the filter button ☐ Then all items are filtered to match their filters		

Story #8:	Historical Pricing	Priority	Medium
		Effort	6/10
As a	Customer		
I want	To preview historical pricing		
So that	I can purchase items when they are at a lower price		

Acceptance criteria	Scenario: Customer opens item with historical pricing
	❑ Given I am a customer ❑ When I click onto an item ❑ Then I see the current price ❑ and I see a list of previous prices and specials Scenario: Customer opens item without historical pricing ❑ Given I am a customer ❑ When I click onto an item ❑ Then I see the current price ❑ And a message that historical pricing is unavailable

Story #9:	Login	Priority	Low
		Effort	2/10
As a	Returning user		
I want	Be able to login to my account		
So that	I can track access my account		
Acceptance criteria	Scenario: customer logging on correctly ❑ Given I have an account ❑ When I go to login ❑ And enter my correct details ❑ Then I can sign into my account Scenario: customer logging on incorrectly ❑ Given I have an account ❑ When I go to login ❑ And enter incorrect details ❑ Then I am prompted that entry was incorrect and offered to reset password Scenario: customer logging on without account ❑ Given I do not have an account ❑ When I go to login ❑ Then I am presented with the option to create an account		

Story #10:	**Different lighting themes**	**Priority**	Medium
		Effort	5/10
As a	Customer		
I want	Be able to change the lighting of the website		
So that	I do not strain my eyesight whilst using the website		
Acceptance criteria	Scenario: customer changing light themes ❑ Given I am logged in to the website ❑ When I go to the settings ❑ Then I can change the lighting theme of the webpage		

Story #11:	**Track Deliveries**	**Priority**	Low
		Effort	4/10
As a	Logged In User		
I want	To be able to track my current deliveries		
So that	I can view when my purchases will arrive.		
Acceptance criteria	Scenario: Customer track delivers ❑ Given I have logged into my account ❑ When I click on track delivers ❑ Then I can see my current deliveries ❑ And I can see how long they take till delivery		

Story #12:	**Create account**	**Priority**	Low
		Effort	3/10
As a	new user		

I want	To be able to create an account
So that	I can track and save my shopping history
Acceptance criteria	Scenario: customer opens create account page ❑ Given I am a new user ❑ When I press the create account button ❑ Then I am given a page to input my details Scenario: customer inputs details and creates an account ❑ Given I am on the create account page ❑ and I have input my details ❑ When I press the create account button ❑ Then an account is generated for me

Story #13:	Recover password	Priority	Low
		Effort	3/10
As a	Account holder		
I want	To be able to recover my password		
So that	I can access my account if I forget my password		
Acceptance criteria	Scenario: A user has forgotten their password ❑ Given I have an account and I have forgotten the password ❑ When I press the forgot password button ❑ Then I am sent a recovery email Scenario: User opens their recovery email ❑ Given I have clicked on the link in the recovery email ❑ When I enter my new password ❑ Then my password is updated		

Story #14:	Add item to Shopping cart	Priority	Medium
		Effort	6/10

As a	Account holder
I want	To be able to store items I want to purchase in a cart
So that	I can order multiple items simultaneously
Acceptance criteria	Scenario: User has found a product and wishes to add it to their cart ❑ Given I have chosen an item ❑ When I add an item to my cart ❑ Then the item I added will appear within it ❑ and cart price updates Scenario: User has found a product and wishes to add multiple to their cart ❑ Given I have chosen an item ❑ Given I have selected my quantity ❑ When I add the item to my cart ❑ Then selected quantity will be added to my cart ❑ and cart price updates

Story #15:	Remove item from Shopping cart	Priority	Medium
		Effort	6/10
As a	Account holder		
I want	To be able to remove items I have in my shopping cart		
So that	I can remove accidental additions to it		
Acceptance criteria	Scenario: A user has an item they wish to remove from their cart ❑ Given I have an item in my shopping cart ❑ When I select to remove an item from my shopping cart ❑ Then the item I selected will be removed ❑ and the shopping cart price is updated		

Story #16:	Browsing	Priority	Medium
		Effort	4/10

As a	user
I want	To be able to view item prices
So that	I can decide whether I want to use this website
Acceptance criteria	Scenario: A user with an account wishes to view an item's price ❑ Given I am logged into an account ❑ When I navigate the site ❑ and find an item I like ❑ Click on said item ❑ Then I can see the price of said item Scenario: A user without an account wishes to view an item's price ❑ Given I am not logged into an account ❑ When I navigate the site ❑ and find an item I like ❑ Click on said item ❑ Then I can see the price of said item

Story #17:	View Item	Priority	High
		Effort	6/10
As a	User		
I want	To view the details of an item		
So that	I can decide if I want to purchase it		
Acceptance criteria	Scenario: A user has found an item they what to learn about ❑ Given I have found an item ❑ When I click on an item ❑ Then I see the details of the item ❑ And have the option to add to cart		

Story #18:	View Cart	Priority	High
		Effort	8/10

| As a	User who is shopping
I want	View items in my cart
So that	Know what I am planning to buy
Acceptance criteria	Scenario: User opens their shopping cart with items ❑ Given I have items in the shopping cart ❑ When I click on the shopping cart ❑ Then I can see the items in the cart Scenario: User opens their shopping cart without items ❑ Given I have no items in the shopping cart ❑ When I click on the shopping cart ❑ Then I am prompted with a message that shopping cart is empty

Story #19:	Change Cart Quantity	Priority	Med
		Effort	6/10

As a	customer
I want	To adjust the quantity of items in my cart
So that	I can order the correct amount of items
Acceptance criteria	Scenario: User has items in their cart and wishes to reduce the quantity ❑ Given I have an item in my cart ❑ When I reduce the quantity ❑ and I hit save ❑ Then the quantity is decreased ❑ And the cart price is updated Scenario: User has items in their cart and wishes to increase the quantity ❑ Given I have an item in my cart

❑ When I increase the quantity ❑ and I hit save ❑ Then the quantity is increased ❑ And the cart price is updated	

Story #21:	Checkout Cart	Priority	High
		Effort	x/10
As a	Customer		
I want	To checkout my cart		
So that	I can purchase items I have selected		
Acceptance criteria	Scenario: Customer has a cart with items ❑ Given I have opened my cart ❑ When I hit the checkout button ❑ Then I am taken to the checkout screen Scenario: Customer has a cart without items ❑ Given I have opened my empty cart ❑ When I hit the checkout button ❑ Then I am notified my cart is empty		

System Architecture

Structure Overview
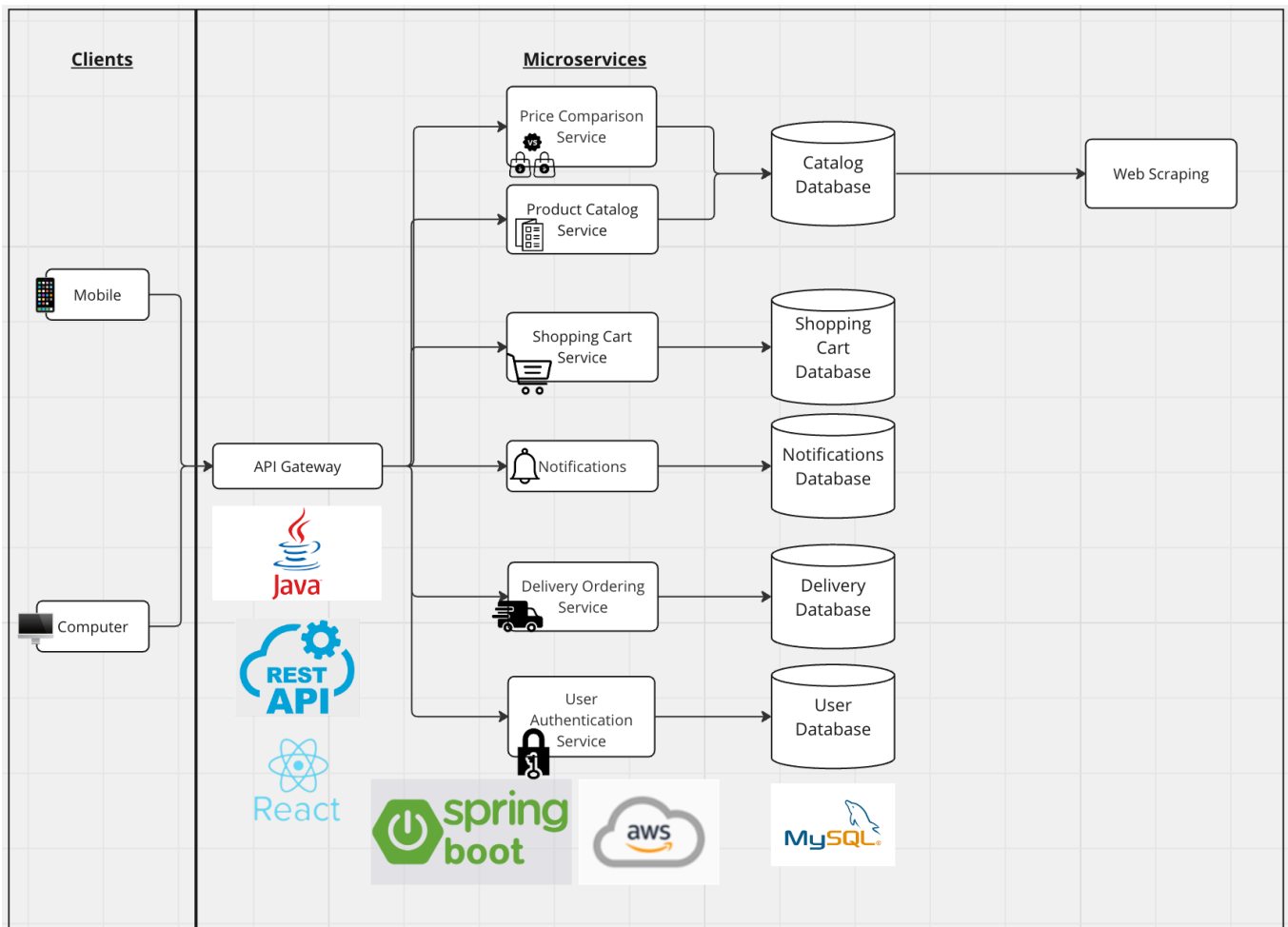
For our project we have proposed for the implementation of the microservices software architecture. In this software architecture we are able to separate the services of price comparison, product catalogue, shopping cart, notifications, delivery ordering and user authentication into their separate components linked to their respective databases (as seen in the above diagram). We have also included a connection from the product database to web scraping in order to fill the product database with products from the web. The separation of these microservices allows for easier testing, maintenance and development since services can be developed and deployed independently, largely reducing dependencies within the code.

In summary, each of the services communicate with the gateway API depending on requests made from the clients, whilst also ensuring security and availability. Then depending on queries made at a particular service by a client, data will be retrieved from the relevant database.

The technologies employed for the components of our software architecture include using React for the front-end framework, Spring Boot for the back-end framework (as per the spec) and MySQL for data storage and querying (as per the spec).

User Interface

UI Design

The overall design of the web application follows the philosophy of unobtrusiveness and to display the data with as much data and transparency as possible. As such, the layout of the application will simply consist of a header, and content to display depending on the webpage. This is to ensure that there can be little confusion as to where to navigate, as all our features will be primarily displayed in the header. To follow along with this simplicity, our UI will not involve any animation or fancy UI components as they could cause issues with screen readers and reduce the accessibility of the application.

In terms of style guides, our primary colours will be cornflower blue and white as they are colours that have a calming effect and fits with the goal of the application, which is to make a wise decision on purchasing products. Additionally, to be as transparent about the display of data, items will be displayed in a grid format with as text to indicate prices as it is easier to navigate different stores and items.

Lastly, we have primarily designed the UI for a desktop application, as we are restricted by the development skills and time constraints to develop the project. This means that the UI design assumes users are utilising a mouse and keyboard to navigate the website and thus relies heavily on button navigation.

Wireframes

Homepage designs:

Two wireframes were created to prototype the landing page of the website. On the left is a mock-up of the landing page for a user who is not signed in. It will thus display the most relevant deals daily, so those who aren't looking for any items can thus simply look at what is the determined best deals of the day.
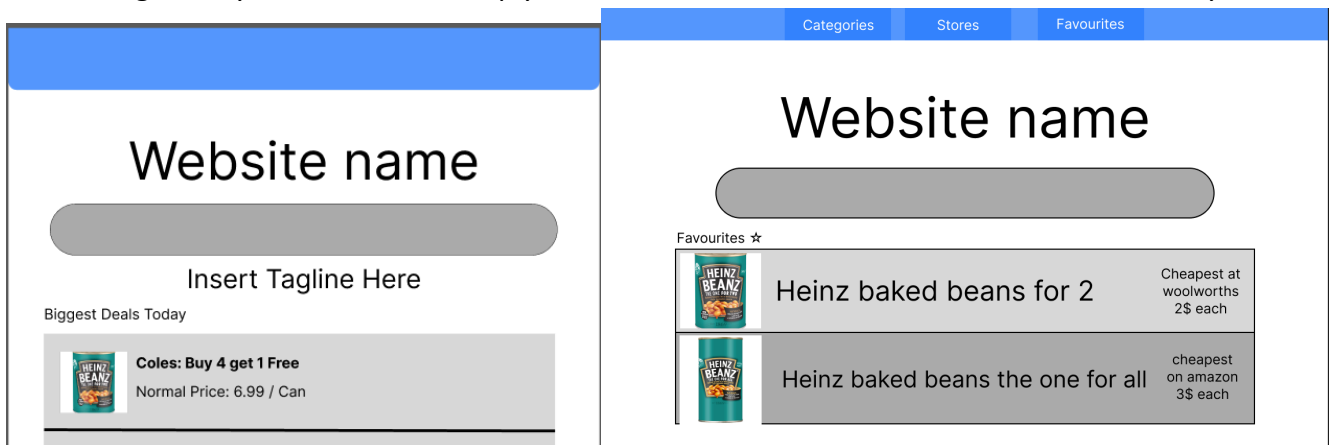
Menu Designs:

The two wireframes represent two extreme possibilities for how the menu could be designed. The left wireframe represents the simplest representation of the menu, with only a search bar, home button and favourites button that would lead to profile. The second wireframe represents a highly detailed menu version that lists several places to look as well as more information from the search.
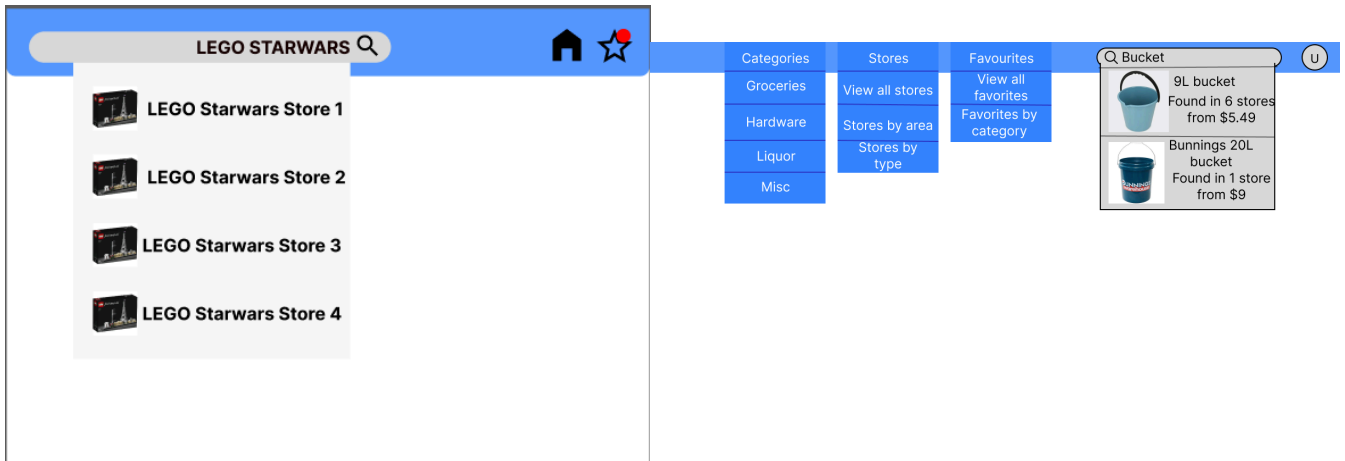
Product page designs

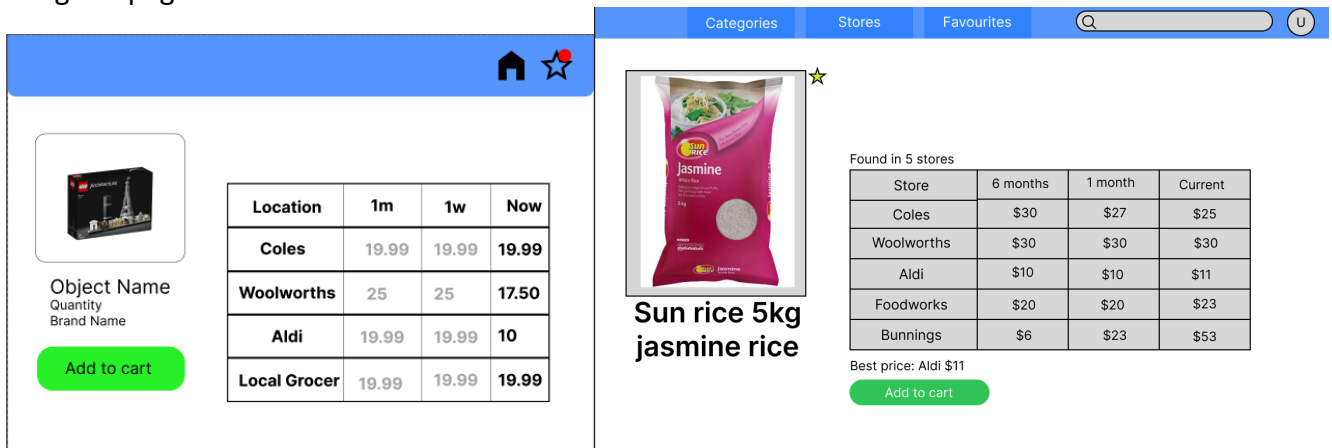These two wireframes represent what the look of the product page will be displayed and is designed to show as much information as possible in a clear manner. The different prices are displayed in a grid and is made the emphasis of the page relative to the rest of the page content to emphasise the data when viewing the page.

Location	1m	1w	Now
Coles	19.99	19.99	19.99
Woolworths	25	25	17.50
Aldi	19.99	19.99	10
Local Grocer	19.99	19.99	19.99

Object Name
Quantity
Brand Name

Add to cart

Sun rice 5kg jasmine rice

Found in 5 stores

Store	6 months	1 month	Current
Coles	$30	$27	$25
Woolworths	$30	$30	$30
Aldi	$10	$10	$11
Foodworks	$20	$20	$23
Bunnings	$6	$23	$53

Best price: Aldi $11

Add to cart

User profile design:

The profile page is intended to be used as the quick access to all the items the user has been favourited with a quick indicator of whether the price is up or down from their previously measured price. Additionally, this is where they can access settings and the logout ability.
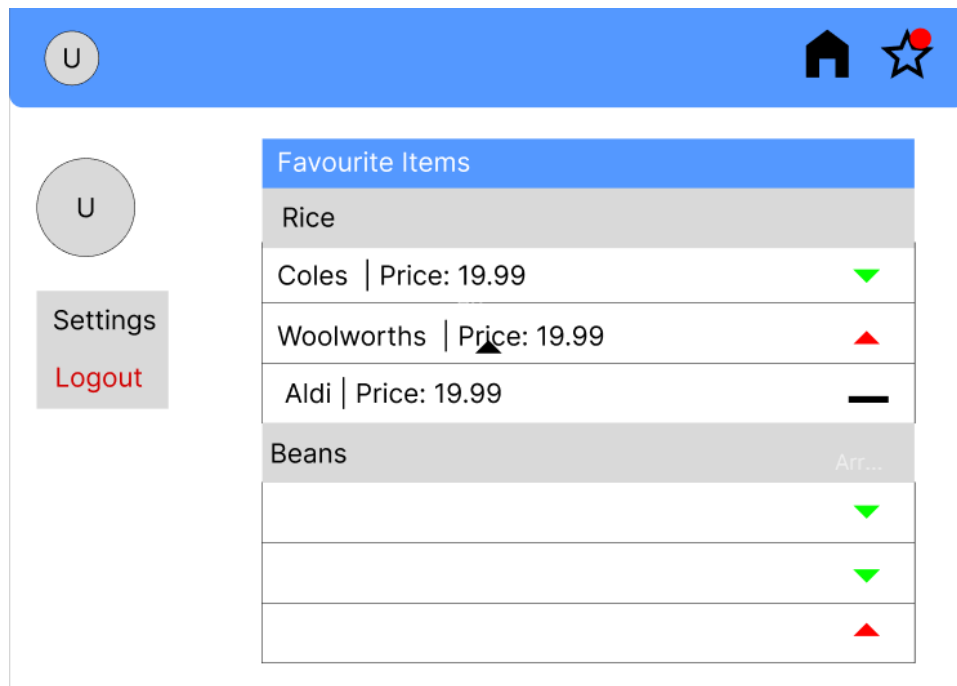
Cart menu design:

The wireframe of the cart menu design allows users to adjust the quantity of the products they've put in the cart. The removal components that would remove products or clear the entire cart has been highlighted in bright red to ensure that users don't accidentally click on those without intending to.
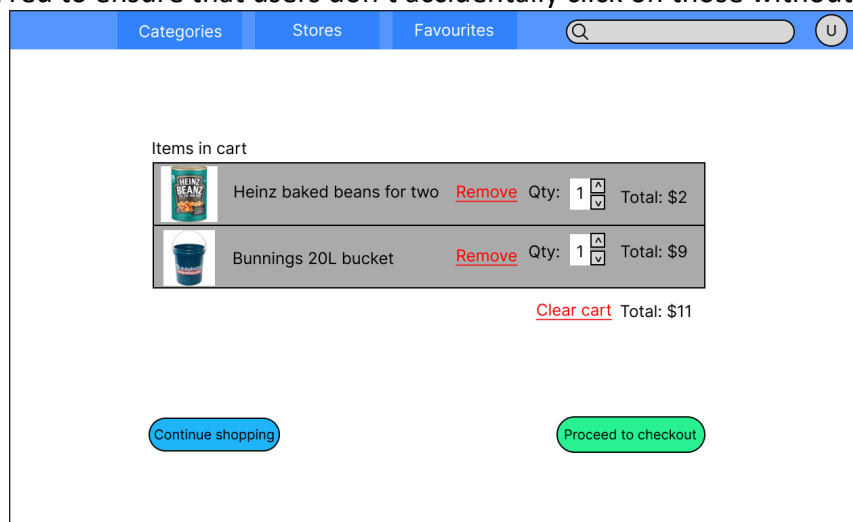
Checkout Page Design

The checkout page is orientated in a way that when reading from left to right, top to bottom, the user has a chance to double check the pricing before submitting their payment details and ordering.

User details:

Full Name:
James Barthomomwel the third

Email Address:
James@Bigpond.edu.au

Address:
401 Swanston street

Post code:
3000

Payment method:
Mastercard ▼

Sign in to save time on
future purchases!

Total:

Cart total:	$11
Delivery cost:	$2.99
Total cost	$14.99

Mastercard Payment details

Card Number:

Name on Card:

Expiration   CVC

Submit order

Search Results Page Design:

This wireframe clearly displays all products from the query to the customer. It also allows the user to sort and filter the results, enhancing their searching experience.

Showing results for: 'Bannanana'
120 results found: showing 1-20

⬇ Sort By   ☰ Filters

	Cavendish Bananas	Found in 6 stores, from $0.79 each	Add to cart
	Red tipped Bananas	Found in 4 stores, from $0.99 each	Add to cart
	Lady finger Bananas	Found in 31 stores, from $10.49 each	Add to cart

Testing – Testing Plan

Unit Testing

Regarding unit testing, we will take a testing first approach by developing unit tests prior to development of front and backend functionality. Our testing will primarily focus on functional testing since for our first 2 sprints these will be our main priority and non-functional testing will primarily be left until a later sprint.

Integration Testing

For integration testing since we are using a model view controller infrastructure, we will use an incremental method of testing is well suited for the integration testing. This will require us to run unit test on each of our components before gradually implementing our components one by one. This method works best with the process of unit testing

System Testing - Acceptance Criteria

For the system testing we will use the acceptance criteria from our user stories which are listed in the user stories section of this document

Product Backlog

Sprint 1 and 2

The sprint 1 and 2 backlogs are recorded inside the GitHub Project Board screenshots are provided here for reference

GitHub Project Board Link: https://github.com/orgs/cosc2299-sept-2023/projects/163

Estimated Backlog – Sprint 1

	Title	Assignees	Status	Iteration	Estimate	Linked pull requests	Labels
1	Create Product Repository #22		New	Sprint 1	2		Area: Backend
2	Create Delivery Repository #24		New	Sprint 1	2		Area: Backend
3	Create Cart Repository #25		New	Sprint 1	2		Area: Backend
4	Create Notification Repository #26		New	Sprint 1	2		Area: Backend
5	Create Home Page #27		New	Sprint 1	1.5		Area: Frontend
6	Create product page #28		New	Sprint 1	1		Area: Frontend
7	Create cart page #29		New	Sprint 1	1		Area: Frontend
8	Create search results page #32		New	Sprint 1	1		Area: Frontend
9	Develop product categories #34		New	Sprint 1	1		Area: Backend
10	Search Term Capture from UI #35		New	Sprint 1	4		Area: Backend
11	Implement webpage navigation #36		New	Sprint 1	1		Area: Backend
12	Add To Cart functionality for result page added #48		New	Sprint 1	1		Area: Backend
13	Add Item To Cart functionality for product page added #49		New	Sprint 1	1		Area: Backend
14	Database data queried for product page #51		New	Sprint 1	5		Area: Backend
15	Linked product database to search functionality #50		New	Sprint 1	3		Area: Backend
16	Search Querying #37		New	Sprint 1	3		Area: Backend

Estimated Backlog – Sprint 2

	Title	Assignees	Status	Iteration	Estimate	Linked pull requests	Labels
1	Create User Repository #23		New	Sprint 2	2		Area: Backend
2	Create user profile page #30		New	Sprint 2	1		Area: Frontend
3	Create checkout page #31		New	Sprint 2	1		Area: Frontend
4	Create notifications icon #33		New	Sprint 2	1		Area: Frontend
5	Implement increase quantity functionality for cart #41		New	Sprint 2	1.5		Area: Backend
6	Implement decrease quantity functionality for cart #42		New	Sprint 2	1.5		Area: Backend
7	Implement remove item functionality for cart #44		New	Sprint 2	1.5		Area: Backend
8	Implement adding item to favourites #39		New	Sprint 2	1		Area: Backend
9	Implement adding a new account to database #43		New	Sprint 2	1		Area: Backend
10	Implement notification functionality for website #46		New	Sprint 2	8		Area: Backend
11	Add filter menu #38		New	Sprint 2	1		Area: Frontend
12	Add filter functionality #40		New	Sprint 2	3		Area: Backend
13	Image for item linked to product page #45		New	Sprint 2	7		Area: Backend
14	Cart price calculation implemented #47		New	Sprint 2	1		Area: Backend

Sprint 0 Retro

1. Things That Went Well

The team rapidly built rapport, aligning closely on project goals, with each member demonstrating commitment. The distribution of the workload was fair and even, fostering a healthy work environment. Communication was constructive, positive, and frequent, a factor that has contributed to the team being on track to achieve project milestones. Our proactive approach has been a highlight of our success.

2. Things That Could Have Gone Better

Our client interactions were lacking some depth and detail, regarding information. In particular, the functional and non-functional requirements were not sufficiently explored. To improve this, a well structured and planned approach to client meetings is needed, including prepared questions to obtain a clearer understanding of their needs and expectations.

3. Things That Surprised Us

We were confronted with unexpected challenges in task distribution, resulting in a need for collaborative effort on certain sections. The number of meetings required each week was also a surprise, with a minimum of four being necessary. A difficulty in understanding specific tasks due to conflicting specifications was an unforeseen challenge. After careful examination and discussion, we overcame this, but it served as a learning opportunity.

4. Lessons Learned

Our experience has taught us the importance of a flexible approach to teamwork, recognizing that a mix of individual and small group work can be most effective. More careful planning and a structured approach to client interactions are vital, as well as the need to host regular meetings to ensure we are all on the same page and have a clear understanding. These lessons will be essential for the upcoming sprints, contributing to ongoing refinement and success.

5. Final Thoughts

So far, the project and teamwork has gone smoothly, with the team looking forward to the upcoming sprints and working collaboratively.