



## FINAL REPORT

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**COMP3900-W16A-GOODNAME**

Eric Du (z5208062)

Jonathan Liu (Scrum Master) (z5258906)

Reyner Ong (z5211715)

Avin Singh (z5222179)

Junxuan Zhang (z5221478)

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# 1 OVERVIEW

This section provides an overview of the problems MyRecipes attempts to solve, some novel features while make it superior to existing systems, and a description of the system architecture.

## 1.1 PROBLEM STATEMENT

The primary problem we are attempting to solve is a lack of a robust, feature-full social-network style platform where contributors can share their recipes to the world, and viewers can interact with them by liking and commenting.

## 1.2 NOVEL FEATURES

As stated in our proposal, and met in our final product, four novel features make the system stand out among the competition:

1. Automatic nutrition information not requiring manual input
2. Chat bot functionality
3. Granular search including advanced filtering based on ingredients, method, meal-type and recipe name.
4. News feed and subscribing allowing viewers to subscribe to particular contributors

Features 1 and 2 provide functionality beyond the original project specification.

## 1.3 SYSTEM ARCHITECTURE

This section provides an overview of the system architecture that makes MyRecipes work.

### SYSTEM ARCHITECTURE DESCRIPTION

#### *INTERFACE LAYER (FRONT-END)*

The interface layer or front-end is the user interface which users interact with on their devices. It allows users to view information and send requests to the web application.

We have selected React as our main front-end framework. We have selected React-Bootstrap as the main library providing user interface components, due to its clean overall design and ease of customisation and use. Additionally, some interface components not available in React-Bootstrap come from Material-UI. We chose React Router to handle routing and React Chat Plugin for the chatbot interface.

The interface layer communicates with the business layer (back-end) with a defined HTTP API, consisting of, primarily, JSON bodies. At times, FormData is used to transmit certain data like images. Please see the section 1.3.3 for details on this.

#### BUSINESS LAYER (BACK-END)

The business layer of the back-end handles the requests sent from the interface layer and provides responses based on what the interface layer requires. It also prevents users from accessing secured parts of the web application directly since the business logic in this layer will verify the users' permission before fulfilling the requests.

We have selected Python as our main back-end language. We have chosen Flask as our main back-end framework. We incorporated other libraries such as PyMySQL and PyJWT to perform specialised tasks such as communicating with our database and encoding-decoding JSON Web Tokens.

The business layer communicates with the data layer to store and retrieve information. Communication between the back-end and the database occurs by SQL queries transmitted by the PyMySQL library. This library enables us to get response tuples in a easy to use Python-typed array of dictionaries.

#### DATA LAYER

The data layer or database stores persistent information utilised by the web application and can only be accessed by the business layer. The information stored includes user details and recipe information. Passwords are stored as a secure salted hash, making any data compromises futile. We have selected MySQL as our main database technology.

#### API LAYER

The API layer enables the web application to interact with external applications.

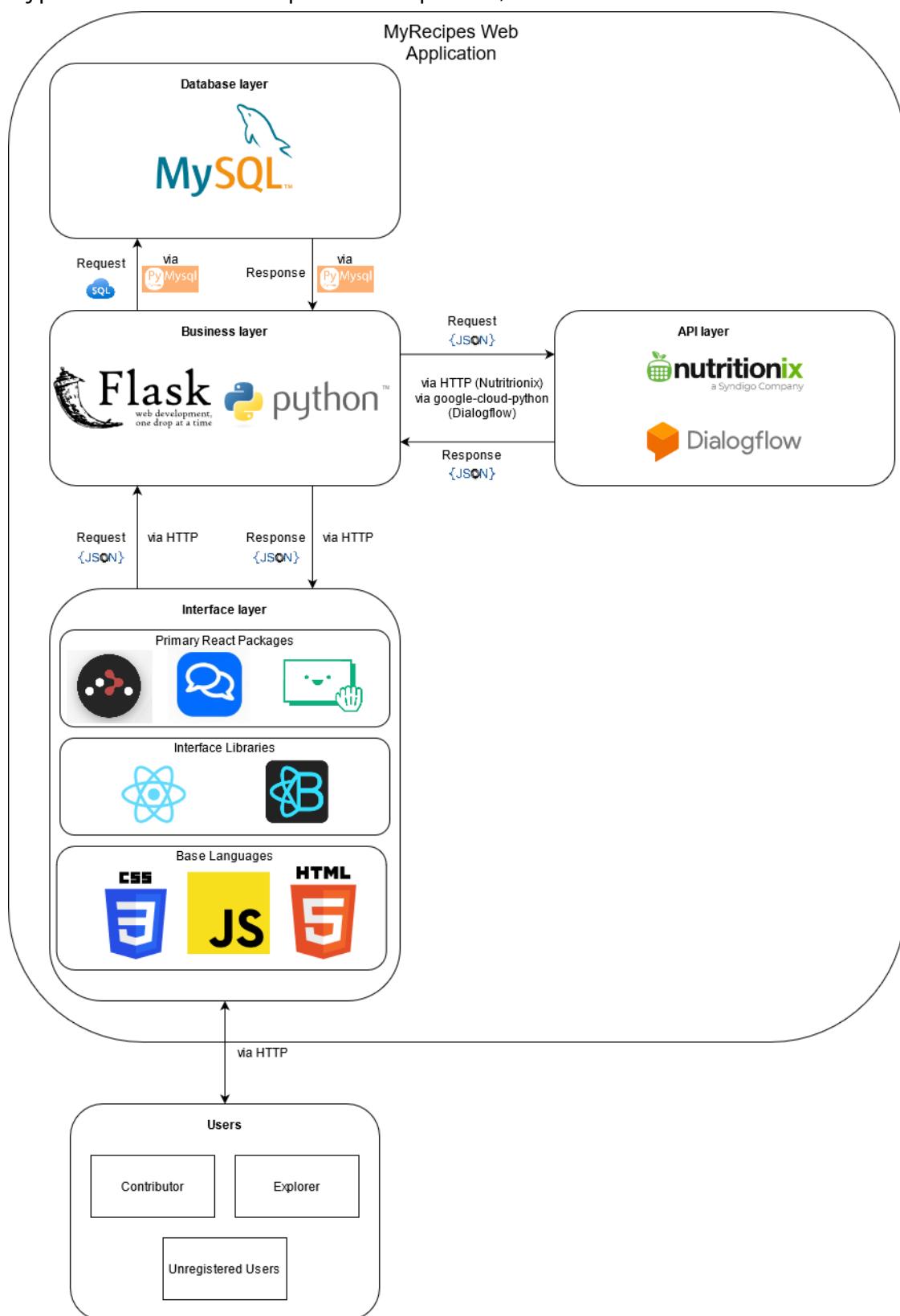
The API layer is primarily used to implement two novel features: nutrition and chatbot. We used Nutritionix and Google Dialogflow for these purposes.

Communication with Nutritionix occurs via HTTP with JSON body. We POST the ingredients and quantity data in JSON to the API, and the API returns the nutritional information in JSON.

Communication with Dialogflow occurs using the google-cloud-api Python library. This allows us to authenticate with the Google Cloud system securely and provides a 'black box' where we don't need to deal with JSON/HTTP directly. Requests can easily be sent with the built-in functions in the google-cloud-api library. Responses can be easily accessed by the functions and objects provided in the google-cloud-api library.

## SYSTEM ARCHITECTURE DIAGRAM

The diagram below has been updated from the proposal to include more detail as to the types and method of requests & responses, and to include additional libraries.



## SYSTEM ARCHITECTURE: FRONTEND/BACKEND API

It was mentioned above in 1.3.1 that we communicate between the front-end and back-end using a HTTP API. The below table describes the API in full.

Note: the output on failure is always a **JSON** body with the key '**error**'. The error message is the field for the 'error' key. The appropriate HTTP error code will also be sent. Conversely, on success, a 200 code will be sent.

URL Prefix: /auth		
URL / METHOD	Input	Output on success
/register POST	<b>JSON</b> email password first_name last_name	<b>JSON</b> (empty)
/emailconfirm POST	<b>JSON</b> code	<b>JSON</b> (empty)
/verify GET	<b>Headers</b> Authorization	<b>JSON</b> user_id
/login POST	<b>JSON</b> email password	<b>JSON</b> token
/forgetpassword POST	<b>JSON</b> email	<b>JSON</b> (empty)
/resetpassword POST	<b>JSON</b> reset_code password	<b>JSON</b> (empty)
/verifyresetcode	<b>JSON</b> reset_code	<b>JSON</b> (empty)

URL Prefix: /profile		
URL / METHOD	Input	Output on success
/view GET	<b>URL arguments</b> user_id	<b>JSON</b> Email FirstName LastName ProfilePictureURL
/changepassword POST	<b>Headers</b> Authorization  <b>JSON</b> OldPassword NewPassword	<b>JSON</b> (empty)
/edit POST	<b>Headers</b> Authorization  <b>JSON</b> FirstName LastName Token (authorisation header)	<b>JSON</b> (empty)
/changepicture POST	<b>Headers</b> Authorization  <b>FormData</b> ProfilePicture	<b>JSON</b> (empty)
/removepicture GET	<b>Headers</b> Authorization	<b>JSON</b> (empty)
/recipes GET	<b>URL arguments</b> user_id	<b>JSON</b> Array of Dicts with recipe data
/recipes/liked GET	<b>URL arguments</b>	<b>JSON</b>

	user_id	Array of Dicts with recipe data
/recipes/profileuserliked GET	<b>URL arguments</b> user_id	<b>JSON</b> Array of Dicts with recipe data
/comments	<b>URL arguments</b> user_id	<b>JSON</b> Array of Dicts with comment data
/changeemail POST	<b>Headers</b> Authorization  <b>JSON</b> Email	<b>JSON</b> (empty)
/times_liked GET	<b>Headers</b> Authorization  <b>URL arguments</b> user_id	<b>JSON</b> times_liked
/findusers POST	<b>JSON</b> input	<b>JSON</b> Array of Dicts with user data.

URL Prefix: /recipe		
URL / METHOD	Input	Output on success
/create POST	<b>Headers</b> Authorization  <b>FormData</b> name type time description	<b>JSON</b> recipe_id

	serving_size ingredients (JSON array) steps (JSON array) photo_names (JSON array) photos[]	
/view GET	<b>URL arguments</b> recipe_id	<b>JSON</b> Dict containing recipe data
/editdescription POST	<b>Headers</b> Authorization  <b>JSON</b> name time type serving_size recipe_id	<b>JSON</b> (empty)
/editingredients POST	<b>Headers</b> Authorization  <b>JSON</b> ingredients (array of dict, dict keys: 'name', 'quantity', 'unit') recipe_id	<b>JSON</b> (empty)
/editsteps POST	<b>Headers</b> Authorization  <b>JSON</b> recipe_id steps (array)	<b>JSON</b> (empty)
/editphotos POST	<b>Headers</b> Authorization	<b>JSON</b> (empty)

	<b>FormData</b> photos[] photo_names (JSON array) recipe_id	
/delete DELETE	<b>Headers</b> Authorization  <b>JSON</b> recipe_id	<b>JSON</b> (empty)
/nutrition GET	<b>URL arguments</b> recipe_id	<b>JSON</b> calories total_fat saturated_fat cholesterol sodium total_carbohydrate dietary_fiber sugars protein potassium p
/like POST	<b>Headers</b> Authorization  <b>JSON</b> recipe_id	<b>JSON</b> (empty)
/isliked GET	<b>Headers</b> Authorization  <b>URL arguments</b> recipe_id	<b>JSON</b> is_liked

/comment POST	<b>Headers</b> Authorization  <b>JSON</b> recipe_id comment	<b>JSON</b> Array of dict with updated comments
/comment/delete POST	<b>Headers</b> Authorization  <b>JSON</b> comment_id	<b>JSON</b> Array of dict with updated comments

URL Prefix: /search		
URL / METHOD	Input	Output on success
/ POST	<b>Headers</b> Authorization  <b>JSON</b> name type serving_size ingredients step_key_words	<b>JSON</b> Array containing recipe data
/history GET	<b>Headers</b> Authorization	<b>JSON</b> Array of dict with fields with (term, time)
/history/remove DELETE	<b>Header</b> Authorization  <b>JSON</b> search_term, time	<b>JSON</b> (empty)

URL Prefix: /newsfeed		
URL / METHOD	Input	Output on success
/subscribe POST	<b>Headers</b> Authorization  <b>JSON</b> user_id	<b>JSON</b> (empty)
/unsubscribe POST	<b>Headers</b> Authorization  <b>JSON</b> user_id	<b>JSON</b> (empty)
/is_subscribed GET	<b>Headers</b> Authorization  <b>URL arguments</b> user_id	<b>JSON</b> is_subscribed
/get_feed GET	<b>Headers</b> Authorization  <b>URL arguments</b> page	<b>JSON</b> Array of dict containing recipe data
/get_subscriptions GET	<b>Headers</b> Authorization	<b>JSON</b> Array of dict containing recipe data.

## 2 FUNCTIONALITY AND PROJECT OBJECTIVES

### 2.1 PROJECT OBJECTIVES

The project objectives described in our project proposal have been met in full, and were exceeded in some cases.

The project objectives were:

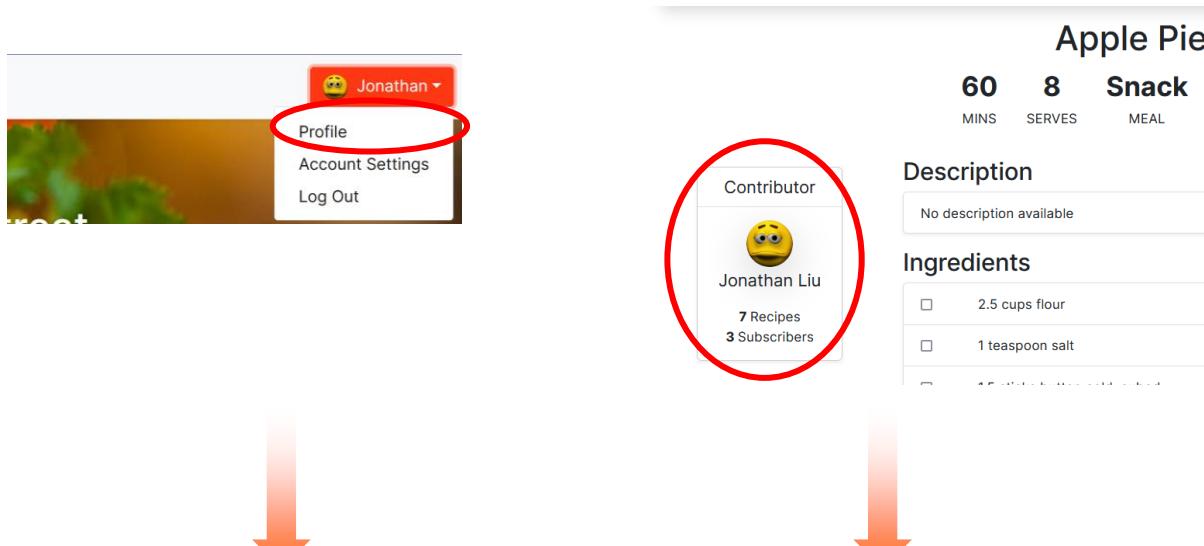
1. A profile where name, details, and recipe contributions are specified.
2. Ability to create, edit and delete recipes.
3. Ability to select the name, ingredients, method and meal-type for the recipe when it is being created.
4. Ability to add pictures to recipes, including a thumbnail (which appears in search results).
5. 'Like' and 'comment' functions on recipes
6. Advanced recommendation system both on news feed and on each recipe page
7. Automatic nutrition information not requiring manual input
8. Chat bot functionality
9. Granular search including advanced filtering based on ingredients, method, meal type and recipe name.
10. News feed and subscribing allowing viewers to subscribe to particular contributors

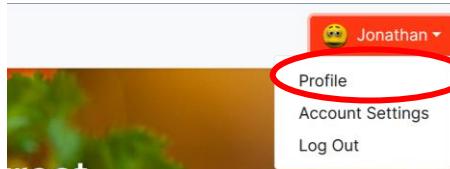
This section will describe and demonstrate the functionality which satisfies each of these project objectives.

## 2.2 A PROFILE WHERE NAME, DETAILS AND RECIPE CONTRIBUTIONS ARE SPECIFIED

We have met this objective, and provided even more functionality to the profile pages of users.

A user's own profile page can be accessed by clicking Profile in the top right menu, and A recipe's creator's profile page can be accessed by clicking on the contributor block:

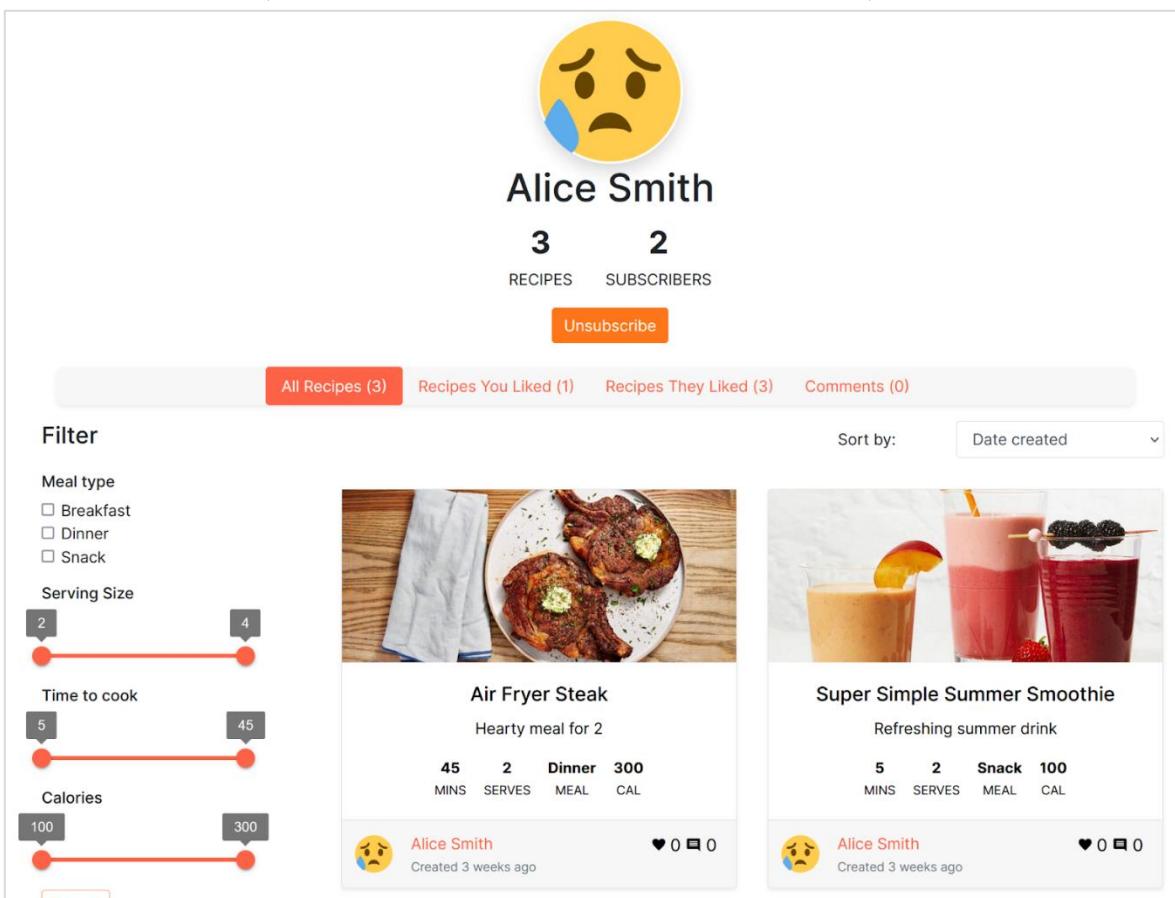




Profile  
Account Settings  
Log Out



Contributor  
Jonathan Liu  
7 Recipes  
3 Subscribers



Alice Smith  
3 RECIPES    2 SUBSCRIBERS  
Unsubscribe

All Recipes (3)    Recipes You Liked (1)    Recipes They Liked (3)    Comments (0)

**Filter**

Meal type:  Breakfast,  Dinner,  Snack

Serving Size:

Time to cook:

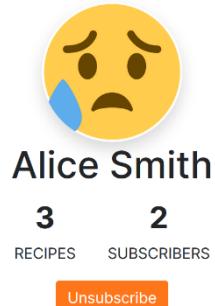
Calories:

Sort by: Date created

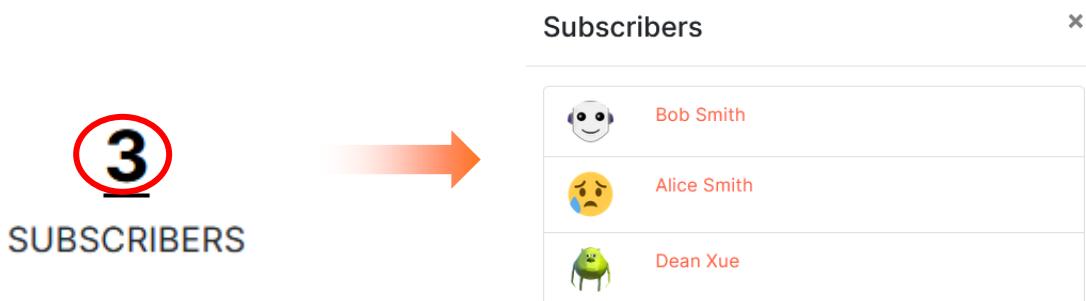
 <p><b>Air Fryer Steak</b> Hearty meal for 2 45 MINS    2 SERVES    Dinner    300 CAL</p> <p> Alice Smith    Created 3 weeks ago</p>	 <p><b>Super Simple Summer Smoothie</b> Refreshing summer drink 5 MINS    2 SERVES    Snack    100 CAL</p> <p> Alice Smith    Created 3 weeks ago</p>
--	---

## DETAILS BLOCK

The details block, at the top of the page, provides the user's profile picture, name, and recipes and subscriber count.



If the user is logged in, the details block also provides the ability to view a list of subscribers and a list of subscriptions by clicking the number.



Subscribers

	Bob Smith
	Alice Smith
	Dean Xue

## CONTRIBUTIONS BLOCK

The contributions block provides a list of:

- “**All Recipes**” - the recipes the user has created
- *If logged in:* “**Recipes You Liked**” - the recipes the user has created that the active user (the user viewing the profile) has liked
- “**Recipes They Liked**” - the recipes that the user has liked
- “**Comments**” - the comments that the user has posted

These can be accessed by changing the active tab:

All Recipes (3) Recipes You Liked (1) Recipes They Liked (3) **Comments (7)**

Sort by:  
Newest

	<b>BEST fried potatoes</b> Charlie Fitzgerald 3 days ago Any thoughts?
	<b>The Classic Burger</b> Jonathan Liu 3 days ago DELICIOUS!!!
	<b>Spaghetti Bolognese</b> Jonathan Liu

All Recipes (3) Recipes You Liked (1) Recipes They Liked (3) **Comments (7)**

Filter

Meal type  
 Breakfast  
 Dinner  
 Snack

Serving Size

Time to cook

Calories

**Air Fryer Steak**  
Hearty meal for 2

45 MINS	2 SERVES	Dinner MEAL	300 CAL
---------	----------	-------------	---------

 Alice Smith  
Created 3 weeks ago

**Super Simple Summer Smoothie**  
Refreshing summer drink

5 MINS	2 SERVES	Snack MEAL	100 CAL
--------	----------	------------	---------

 Alice Smith  
Created 3 weeks ago

Additionally, note the ability to filter and sort the lists.

## CONCLUSION

The MyRecipes user profile page goes above and beyond the objective "A profile where name, details, and recipe contributions are specified." Functionality like

- viewing subscriber counts,
- viewing a subscriber list,
- viewing recipes they liked,
- viewing recipes they made that you liked
- viewing their comments
- filtering and sorting functions

exceeded our initial objectives. This objective has certainly been satisfied.

## 2.3 ABILITY TO CREATE, EDIT AND DELETE RECIPES

### RECIPE CREATION

Recipe creation is available for all logged in users.

The creation page can be accessed on any page by clicking 'Create' in the navbar



Recipe creation is guided in stages. The first stage is to input the details:

#### Create Recipe

Show all   Collapse all

##### ▼ Details

Name

Type

-- Select an option --
Time (minutes)
Serving size

Description

[Next: Ingredients](#)

► [Ingredients](#)

► [Directions](#)

► [Photos](#)

[Create Recipe](#)

When the user clicks next, they are guided to the ingredients section, where they can add any number of ingredients, with the quantities and units if necessary. They can also move the order with the  $\equiv$  icon.

##### ▼ Ingredients

Ingredients

1	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	<span>x</span>
2	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	<span>x</span>
3	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	<span>x</span>

[Add](#)

[Next: Directions](#)

When the user clicks next, they can fill in the 'directions' i.e. steps. Similarly to the ingredients, they can use the  $\equiv$  to adjust the order of the steps.

#### ▼ Directions

Directions

1	Details	$\equiv$	$\times$
2	Details	$\equiv$	$\times$
3	Details	$\equiv$	$\times$
<a href="#">Add</a>			

[Next: Photos](#)

Finally, they can move on the photos step, where they can add any number of photos:

#### ▼ Photos

Photos

1 (Main)	how-to-make-a-smoothie-1601565091.jpg		$\equiv$	$\times$
2	index.jpg		$\equiv$	$\times$
3	Pizzasupremehoriz-1ccfa0b1732b4c128427d19ae02a422b.jpg		$\equiv$	$\times$
<a href="#">Browse...</a> No file selected.		<a href="#">Create Recipe</a>		

The user can then re-expand any previous sections by clicking on the section

#### ► Details

#### ► Ingredients

#### ► Directions

#### ► Photos

#### ▼ Ingredients

Ingredients

1	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	$\times$
2	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	$\times$
3	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	$\equiv$	$\times$
<a href="#">Add</a>					

[Next: Directions](#)

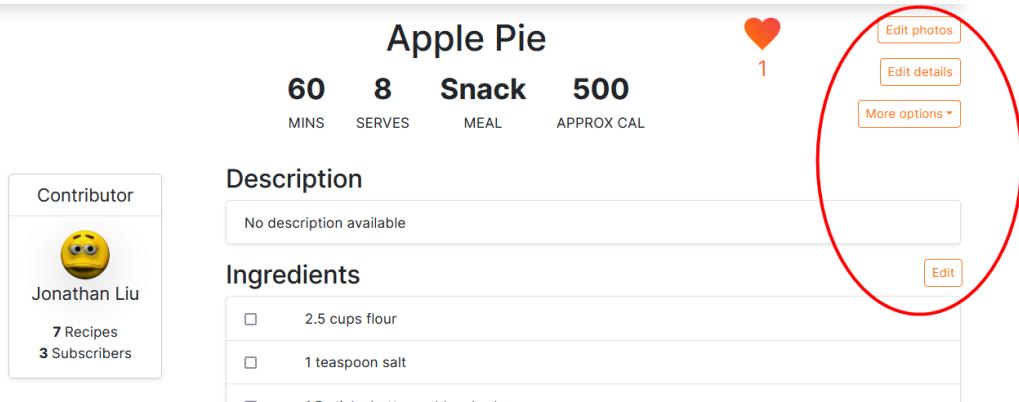
When they're done, they can click 'Create Recipe' and then the recipe will be created.

This demonstrates the functionality for creating recipes.

## RECIPE EDITING

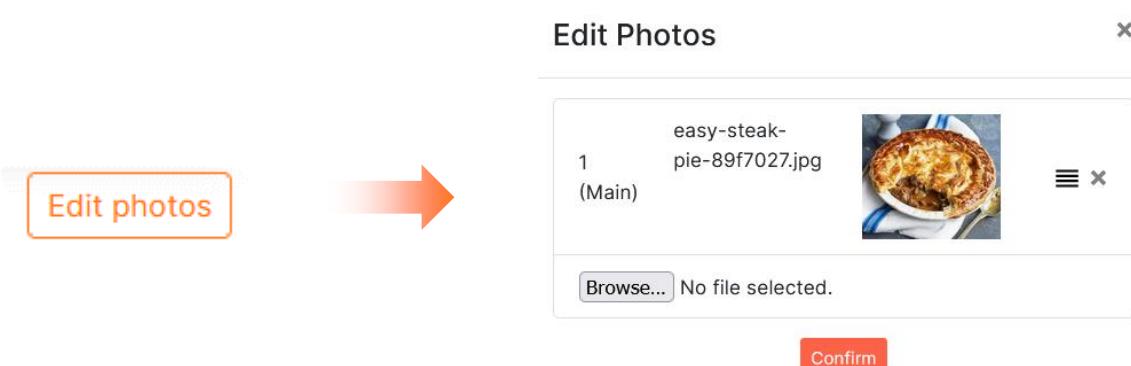
Recipe editing and deletion is performed on the recipe page.

The recipe creator can open the recipe page for the recipe they wish to edit, and additional edit options are revealed:

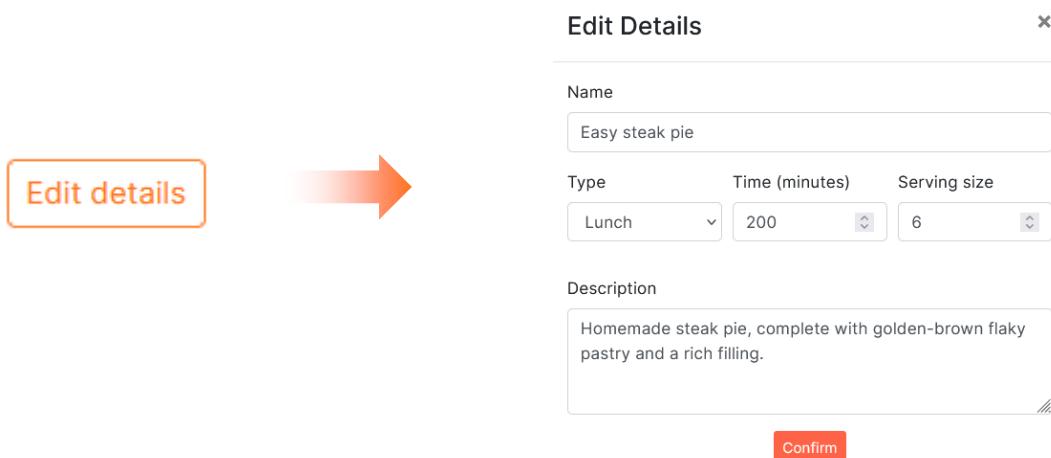


The user can select these options to:

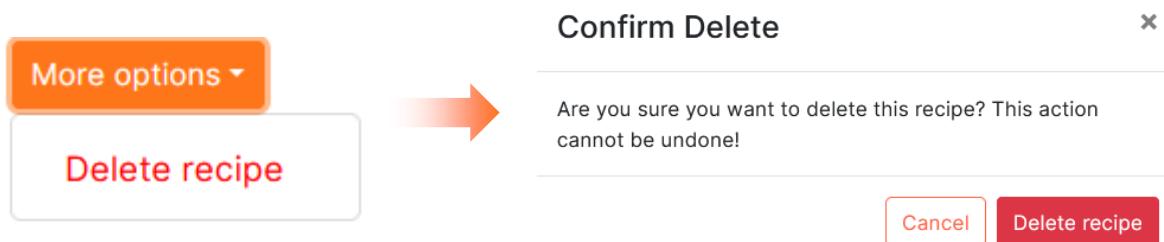
- edit the photos:



- edit details:



- delete the recipe:



- edit the ingredients:

Ingredients					Confirm	Cancel
1	3	dropdown	tbsp	sunflower oil	☰	×
2	1	dropdown	kg	braising steak, diced	☰	×
3	2	dropdown	Unit (if any)	onions, roughly chopped	☰	×
4	3	dropdown	tbsp	plain flour	☰	×
5	1	dropdown	tbsp	tomato ketchup	☰	×
6	2	dropdown	Unit (if any)	beef stock cubes mixed with boiling wa	☰	×
7	375	dropdown	grams	puff pastry	☰	×
8	1	dropdown	Unit (if any)	egg yolk, beaten	☰	×
					Add	

- or edit the steps:

Steps					Confirm	Cancel
1	(Source: bbcgoodfood.com) To make the filling, heat the oven to 160C/140C fan/gas ½. Tip the meat and any juice into a large bowl.	dropdown	dropdown	dropdown	☰	×
2	Scatter over the flour, stirring until the flour turns brown. Tip the meat and any juice into a large bowl.	dropdown	dropdown	dropdown	☰	×
3	To make the pie, heat the oven to 220C/200C fan/gas 7. Tip the filling into a 24-26cm pie dish.	dropdown	dropdown	dropdown	☰	×
					Add	

This functionality demonstrates the ability to edit or delete recipes

## CONCLUSION

As can be seen above, we have fully satisfied the objective: "Ability to create, edit and delete recipes." In summary:

- Users can create recipes by clicking on 'Create' in the nav bar.
- Users can edit and delete recipes by going to the recipe they want to edit or delete, and using the options there.
- Users can edit every field that they could have set in the recipe creation page.

## 2.4 ABILITY TO SELECT THE NAME, INGREDIENTS, METHOD AND MEAL-TYPE FOR THE RECIPE WHEN IT IS BEING CREATED

This project objective has been fully met as seen in the previous section.

- Select name:

### ▼ Details

Name

- Select ingredients:

### ▼ Ingredients

Ingredients

1	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>		
2	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>		
3	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>		
					

- Select method:

### ▼ Directions

Directions

1	Details <input type="text"/>		
2	Details <input type="text"/>		
3	Details <input type="text"/>		
			

- Select meal type:

### Type

-- Select an option -- 

- Breakfast
- Brunch
- Lunch
- Dinner
- Snack

Thus, as can be seen from the previous section and the screenshots above, all the required recipe creation options are met.

## 2.5 ABILITY TO ADD PICTURES TO RECIPES, INCLUDING A THUMBNAIL (WHICH APPEARS IN SEARCH RESULTS)

We saw briefly the ability to add pictures in objective 2. This section shows this objective has been fully met by describing it in more detail.

### ▼ Photos

Photos

No file selected.

To add photos, the user can click “Browse...” button to select a file to upload. Once the file has been uploaded it will appear on the list of photos:

### ▼ Photos

Photos

1 (Main) image.jpg



☰ ×

No file selected.

The first image in the list (marked “(Main)”) is the photo which appears as a thumbnail in search results, and other recipe lists.

The user can use the ☰ to move the photos around, including moving one to the first position to make it the thumbnail.

Photos

1 (Main) Pizzasupremehoriz-1ccfa0b1732b4c128427d19ae02a422b.jpg



☰ ×

2 image.jpg



☰ ×

No file selected.

Then, the image in the first position will appear in search results and recipe (see right).

As can be seen, we have satisfied this project objective. Users can add any number of pictures, and select one as the thumbnail image by moving it to the first position.



**Spaghetti Bolognese**

Super easy and a true Italian classic with a m...

120	6	Dinner	600
MINS	SERVES	MEAL	CAL

 Jonathan Liu       3  8  
Created 3 weeks ago | Modified 2 weeks ago

## 2.6 'LIKE' AND 'COMMENT' FUNCTIONS ON RECIPES

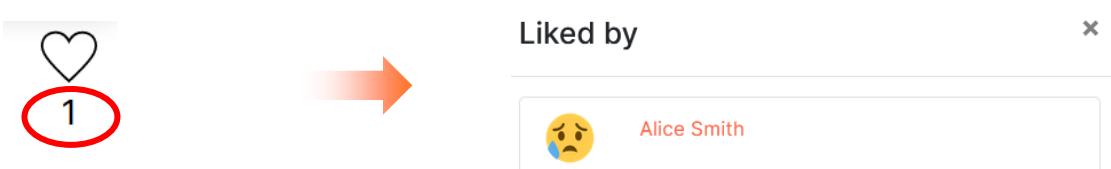
This objective has been achieved.

### LIKING RECIPES

Explorers are able to like and unlike recipes. The number of likes a recipe has can be viewed as well.



It is also possible to view the list of likers by clicking on the number of likes.



## COMMENTING ON RECIPES

Users can also comment on recipes, and delete the comments they posted. Users are able to see others' comments and the time that they posted it.

### 7 Comments

Sort by:

Newest

Leave a comment

Post



Eric Du YOU

oh no i accidentally left a comment here! i better delete it!!

7 minutes ago



Alice Smith

VERY easy to cook btw

1 week ago



Alice Smith

Can't recommend this enough!

1 week ago

Delete



Alice Smith

it is tasty!!

1 week ago



Bob Smith

Looks tasty!

1 week ago



Bob Smith

Giving it a go now!

1 week ago



Dean Xue CREATOR

Any thoughts?

1 week ago

In addition, comments can be sorted chronologically, from oldest to newest or vice versa.

### 6 Comments

Sort by:

Oldest

Oldest

Newest

The **CREATOR** comments as well as the user's comments (**YOU**) can be identified from tags next to the names.

## CONCLUSION

Users have the ability to interact with recipes socially with liking and commenting. This meets this project objective.

## 2.7 ADVANCED RECOMMENDATION SYSTEM BOTH ON NEWS FEED AND ON EACH RECIPE PAGE

This objective has been achieved.

The advanced recommendation system is realised via a personalised news feed for explorers and recipe recommendations for individual recipes.

The personalised news feed is based on a user's subscriptions, recipe likes, recipe creation times and search history. Recommendations are based on search history and are included in the newsfeed. For a more detailed description of the personalised news feed algorithm please view section 4.3.

Your Profile



Eric Du

0 RECIPES    0 SUBSCRIBERS

[Hide Recommended](#)

Subscriptions

-  Charlie Fitzgerald
-  Dean Xue

 Dean Xue  
Created 2 weeks ago | Modified 2 weeks ago



**Beef pho**  
Full of classic Asian flavours along with sirloin steak and noodles

70 MINS    2 SERVES    Lunch MEAL    500 CAL     2  7

 Dean Xue  
Created 2 weeks ago | Modified 2 weeks ago



**Creamy Chicken Pot Pie**  
This Creamy Chicken pot pie with puff pastry and vegetables is comfort food bliss!

105 MINS    6 SERVES    Lunch MEAL    900 CAL     0  0

 Jonathan Liu  
Created 2 weeks ago

RECOMMENDED

Recipe recommendations are based on similar recipe names and mutual ingredients. They are displayed underneath the recipe steps.

#### Recommendations similar to this recipe



Garlicky fried rice with crisp p...

Fried rice with innovative ingredients

**15** MINS   **4** SERVES   **Dinner**   **600** CAL

 Charlie Fitzgerald

Created 2 weeks ago

♥ 0 □ 1



Margherita Pizza

Classic pizza

**30** MINS   **2** SERVES   **Lunch**   **400** CAL



Jonathan Liu

Created 2 weeks ago | Modified 2 weeks ago

♥ 0 □ 0



Spaghetti Bolognese

Super easy and a true Italian classic wi...

**120** MINS   **6** SERVES   **Dinner**   **600** CAL



Jonathan Liu

Created 3 weeks ago | Modified 2 weeks ago

♥ 3 □ 8

For a more detailed description of the recipe recommendation algorithm please view section 4.2.

These features mean that this project objective has been met.

## 2.8 AUTOMATIC NUTRITION INFORMATION NOT REQUIRING MANUAL INPUT

This objective has been met.

In every recipe card, the estimated calorie value is calculated and displayed (to the nearest 100).

**Search Recipes**

14 recipes found Show advanced options

Sort by: Relevance

**Spaghetti Bolognese**

Super easy and a true Italian classic with a m...

120	6	Dinner	<b>600</b>
MINS	SERVES	MEAL	CAL

Jonathan Liu ♥ 3 □ 8  
Created 3 weeks ago | Modified 2 weeks ago

**The Classic Burger**

Delicious restaurant-style, hamburger recipe

30	4	Lunch	<b>600</b>
MINS	SERVES	MEAL	CAL

Jonathan Liu ♥ 1 □ 1  
Created 3 weeks ago | Modified 2 weeks ago

The system displays full nutritional information of any recipe on the recipe page. The nutritional value is calculated by Nutritionix API automatically based on the ingredient types and amount of a recipe. The amount is divided by serving size so that users can see the result for 1 serving. Thus, users can identify a healthy meal according to recipes' nutritional information. This information requires no input from contributors.

**Nutritional Info**

per serving

<b>Calories</b>	634
<b>Fat</b>	31.6 g
Saturated	11.3 g
<b>Cholesterol</b>	115 mg
<b>Sodium</b>	970.1 mg
<b>Potassium</b>	1230.6 mg
<b>Carbohydrates</b>	40.2 g
Sugar	8.5 g
Dietary fibre	4.7 g
<b>Protein</b>	43.1 g

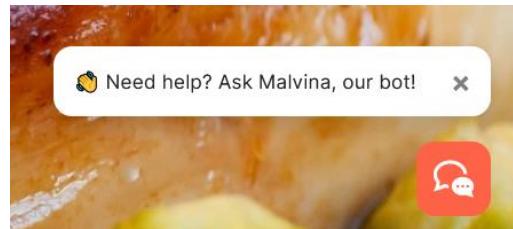
powered by nutritionix  
a Syndigo Company

Clearly, the objective to display nutrition info automatically has been met.

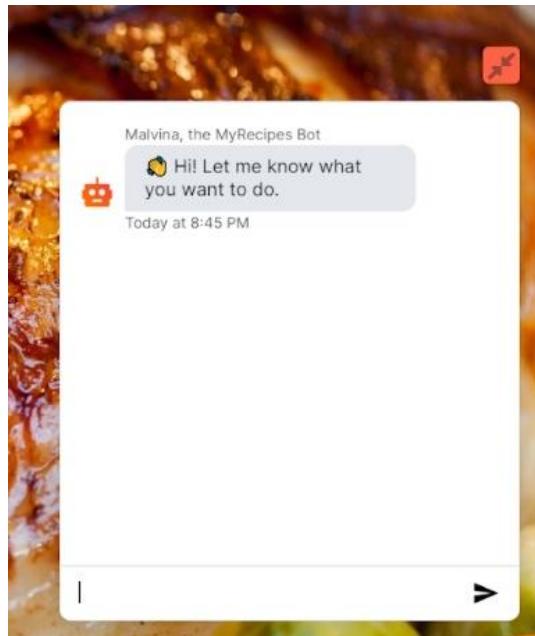
## 2.9 CHAT BOT FUNCTIONALITY

A sophisticated chat bot which can respond to many different queries is provided, meeting this objective.

The button of the chatbot is at bottom-right of the screen, with a notice message above it. The message can be closed.



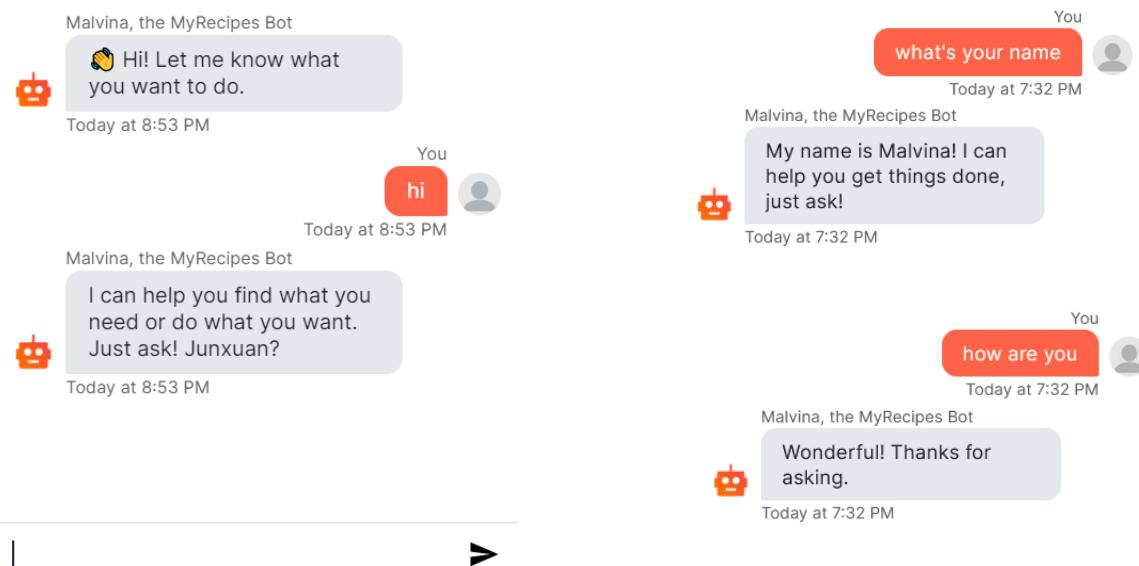
After clicking the button, chatbot interface will appear at bottom right of the screen. All functionalities of other parts of the screen still work. The chatbot section will remain open if user clicks a button (like "Newsfeed") and goes to another interface. The interface can be closed by clicking the button in the top right. Messages can be sent by pressing "Enter" or clicking the send button. Each message has send-time below it.



In the following pages, we describe all chatbot functionality.

## GREETINGS & SMALL TALK

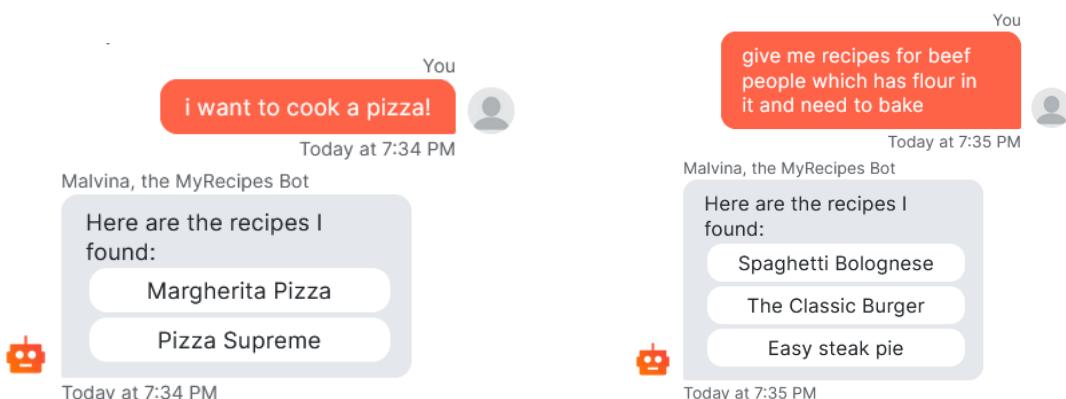
The chatbot supports greetings and basic small talk.

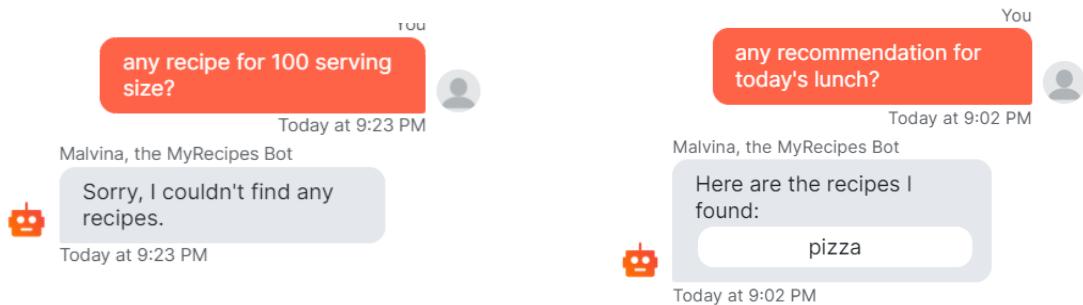


## SEARCH

The chatbot can handle basic searching as well as advanced searching (specifying ingredients, serving size, etc.). Results are linked directly in the chatbot UI.

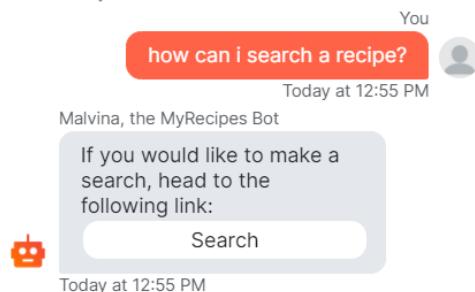
User can send a message which contains a request for searching a recipe. The chatbot will detect different recipe features in messages and do searching automatically. There are 5 features: recipe name, serving size, recipe type (e.g., lunch), ingredient and cooking step/method (e.g., roasting). Chatbot can handle any combination of these 5 features and return corresponding recipes up to 3. User can click the recipe buttons and will be directed to the interface of that recipe. If there doesn't exist any recipe with given features in database, the chatbot will apologise.





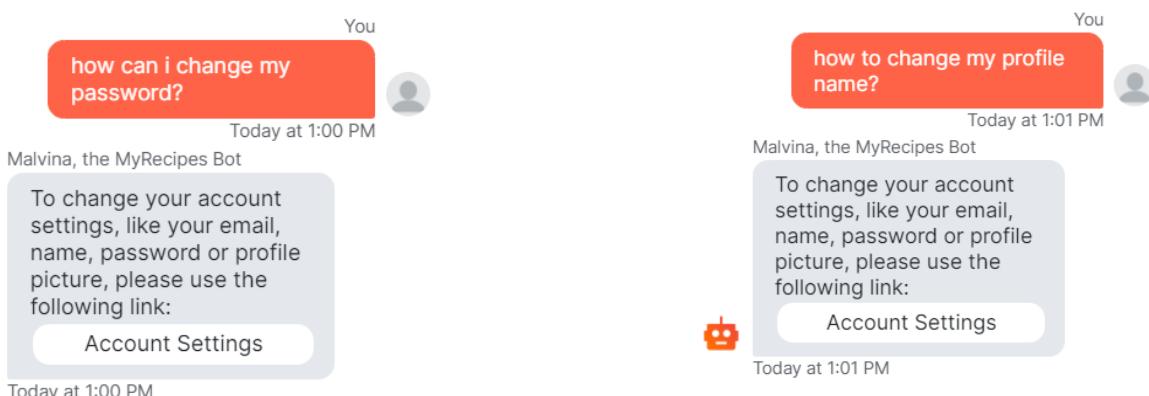
## DIRECT TO SEARCH

User can ask chatbot how/where to search recipes. Chatbot will provide a link which can direct user to the search page.



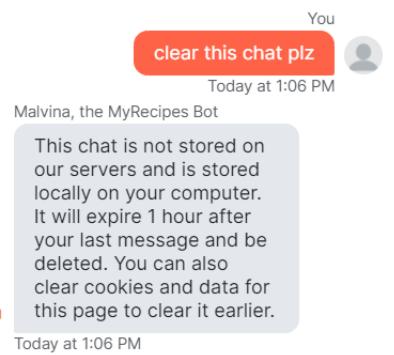
## CHANGE ACCOUNT SETTINGS

User can ask how to change its account settings such as password, email address, name and profile picture. Chatbot will provide a link which directs user to the Account Settings page.



## DELETE CHAT CONTENT

User can ask how to delete this chat. Chatbot will provide the relevant information.



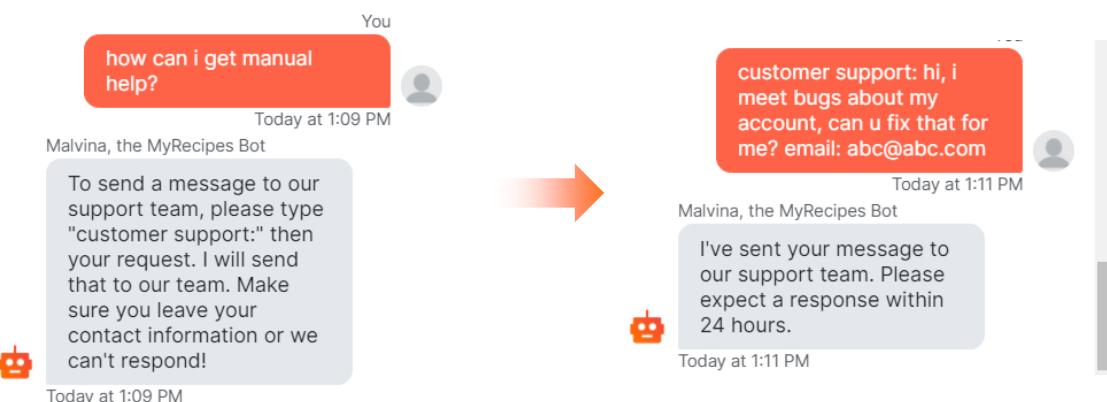
## CREATE RECIPE

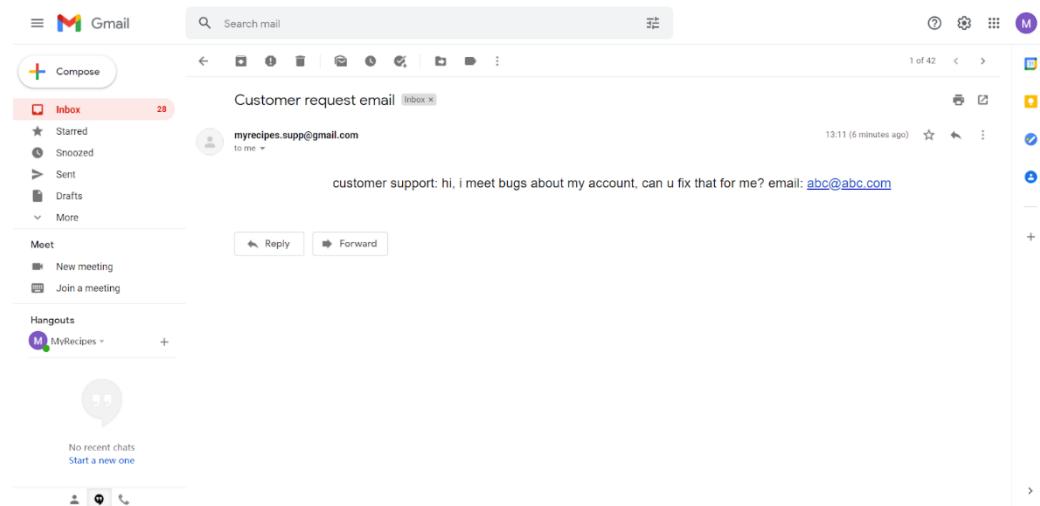
User can ask how to create a recipe. Chatbot will provide the link to the Create Recipe page.



## CONTACT SUPPORT

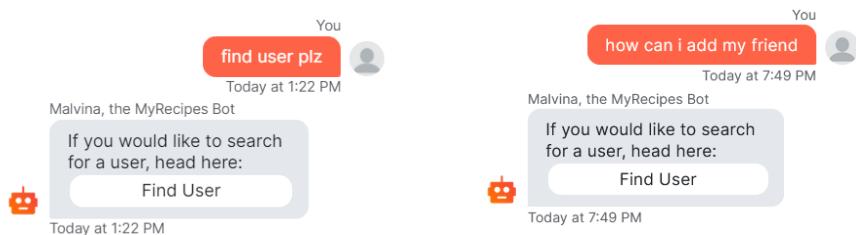
Users can ask to contact customer support service. Chatbot will provide instructions to get manual support. After user follows the instructions and posts a request message, chatbot will automatically send the message as an email to our support email account.





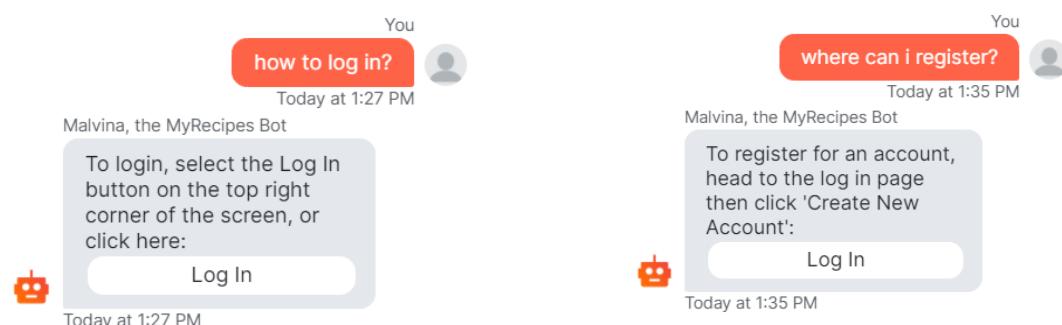
## FIND USER

If users ask how to find a user, they will be provided a link to the Find Users page.



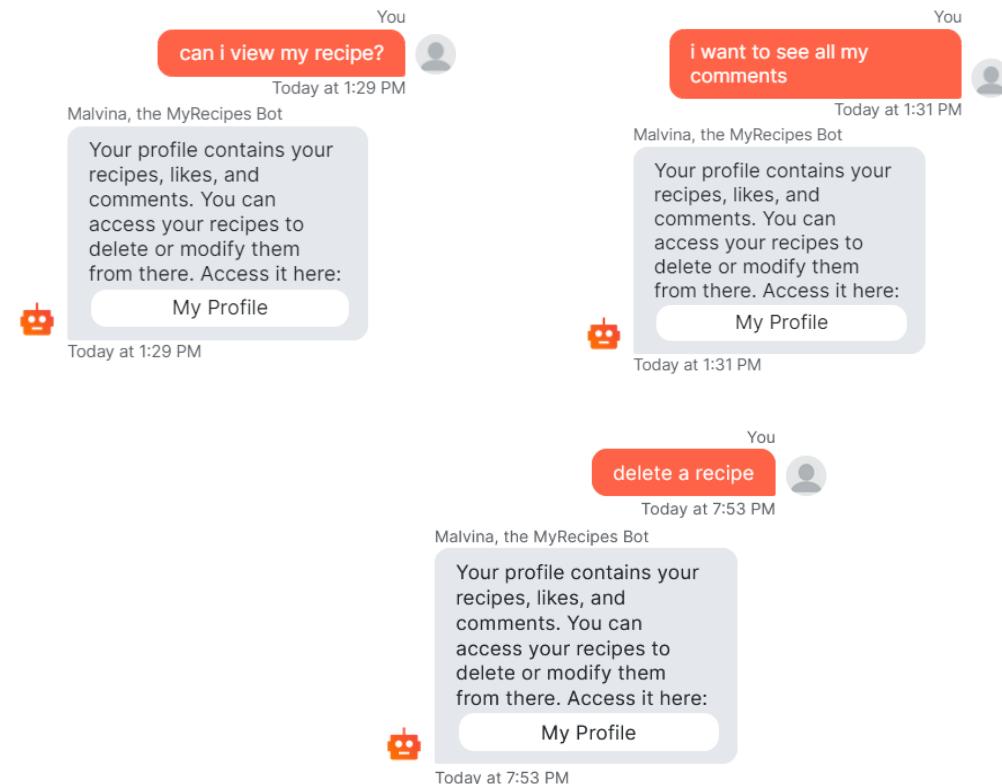
## LOG IN & REGISTER

User can ask how to log in, chatbot will provide the link to the Log-In page. Chatbot will provide the link of log in interface and instruction of creating a new account if user ask how to register/create an account.



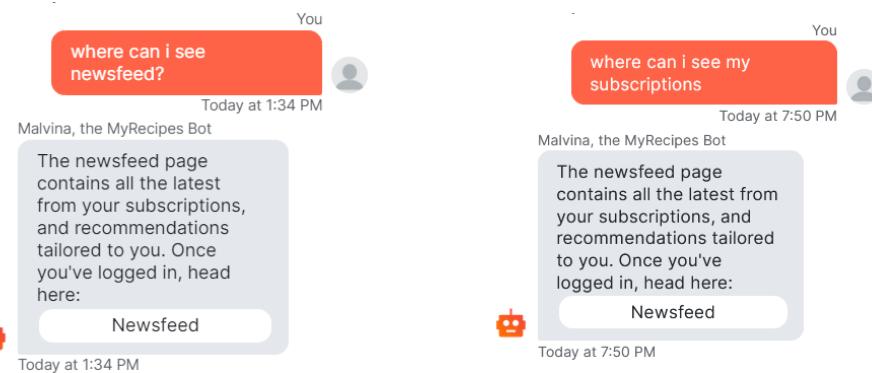
## USER PROFILE

Users can ask chatbot about viewing their recipes/likes/comments or modifying/deleting their recipes. Chatbot will provide the link to current user's profile.



## NEWSFEED

User can ask where to find its newsfeed, or their subscriptions. Chatbot will give the link of newsfeed interface.



## CONCLUSION

The features above demonstrate the breadth of functionality that the chatbot can support. Thus, the project objective is achieved.

## 2.10 GRANULAR SEARCH INCLUDING ADVANCED FILTERING BASED ON INGREDIENTS, METHOD, MEALTYPE AND RECIPE NAME.

MyRecipes has a sophisticated search system which supports advanced filtering.

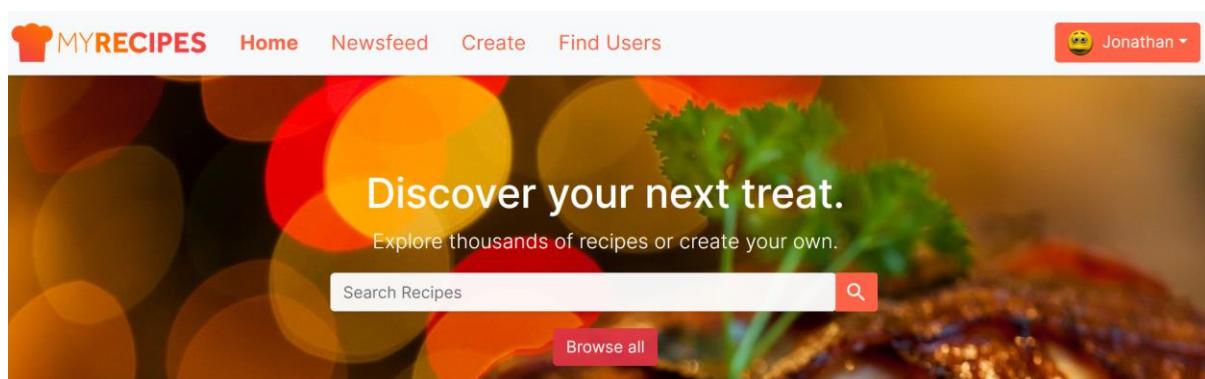
### SEARCH BARS

A search bar is located:

- on the home page
- on the search page
- on any other page, in the navigation bar

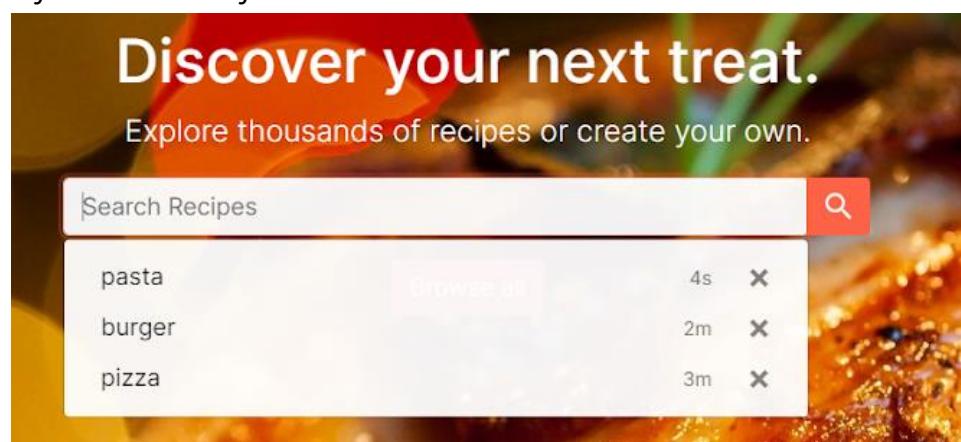
All search bars act the same.

Users can type a recipe's name, ingredient, or step keywords and press 'Enter'/click search to perform a search.



### SEARCH HISTORY

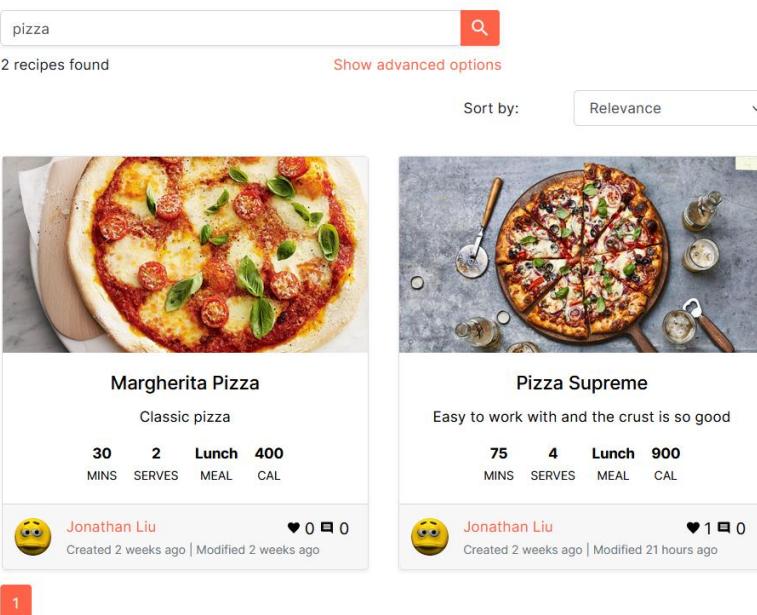
A user's search history will appear below the search bar after clicking it. Search history contains recipes' name and last search time (xx second/min/h ago). User can click the X to delete any search history.



## SEARCH RESULTS

User can search by simply typing something in the search bar. This will provide matches on name, ingredients, and search keywords. After a search is made, search results are displayed as ‘cards’ with large thumbnails to provide visual cues. Search results are ordered by relevance by default. (see 4.1 Search Algorithm section for more details on how this is computed).

### Search Recipes



The screenshot shows the 'Search Recipes' interface with a search bar containing 'pizza'. Below it, a message says '2 recipes found' and a 'Show advanced options' link. A 'Sort by:' dropdown is set to 'Relevance'. On the left, there's a 'Filter' sidebar with the following controls:

- Meal type:** A checkbox for 'Lunch'.
- Serving Size:** A slider from 2 to 4.
- Time to cook:** A slider from 30 to 75 minutes.
- Calories:** A slider from 400 to 900.
- Clear all:** A button to clear all filters.

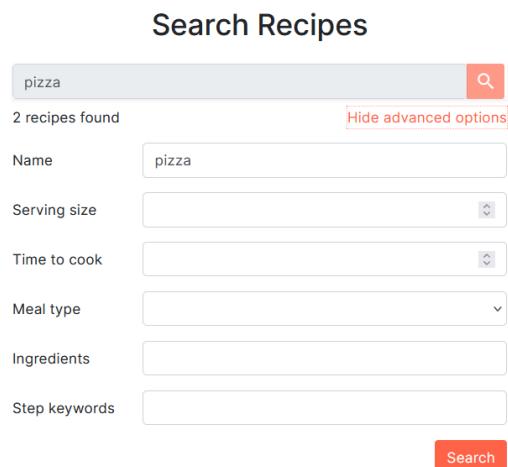
The main area displays two recipe cards:

- Margherita Pizza:** Classic pizza. Details: 30 MINS, 2 SERVES, Lunch MEAL, 400 CAL. By Jonathan Liu, created 2 weeks ago, modified 2 weeks ago.
- Pizza Supreme:** Easy to work with and the crust is so good. Details: 75 MINS, 4 SERVES, Lunch MEAL, 900 CAL. By Jonathan Liu, created 2 weeks ago, modified 21 hours ago.

A red arrow points to the '1' icon at the bottom left of the filter sidebar.

## ADVANCED SEARCH

More granular search is supported by using the advanced options. Click the “Show advanced options” under search bar to unfold advanced search options. Advanced options include recipe’s name, serving size, time to cook, meal type, ingredients and step keywords. User can use any combinations of those for searching. Search result will contain all recipes which satisfy all advanced options. Advanced search options can be hidden by clicking “Hide advanced options”.



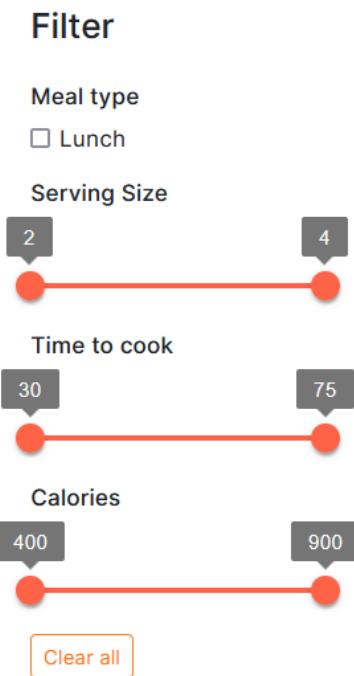
The screenshot shows the 'Search Recipes' interface with the 'Show advanced options' link highlighted in red. An orange arrow points from the text above to this link. The expanded advanced search options are as follows:

	Value
Name	pizza
Serving size	(dropdown menu)
Time to cook	(dropdown menu)
Meal type	(dropdown menu)
Ingredients	(dropdown menu)
Step keywords	(dropdown menu)

A red 'Search' button is located at the bottom right.

## FILTERING SEARCH RESULTS

Users can use the filter at left to filter search results. This operates as a fast alternative to advanced search, and also supports ranges. Users can select one or more meal types by ticking the boxes. Users can also adjust the sliders to select a range for serving size, time to cook and calories. The highest and lowest values for these sliders are based on search results. Clicking the “Clear all” will undo all filtering.



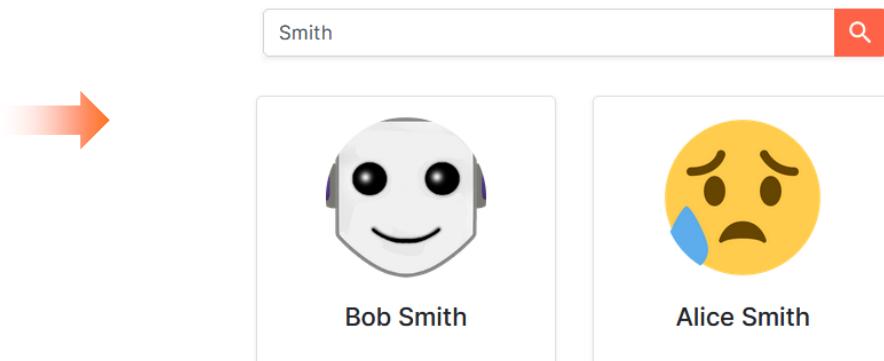
## SEARCH USERS

Exceeding the project objectives, we also have a feature to search for users. This helps users, for example, find a celebrity chef or a friend.

Clicking the “Find User” button on the navigation bar will direct user to the page to search users. Users can type other users’ first name or last name to search. Search result will contain all suitable users’ names and photos. User can click the card for a found user to access their profile page, where they can view their contributions and subscribe.



## Find Users



## CONCLUSION

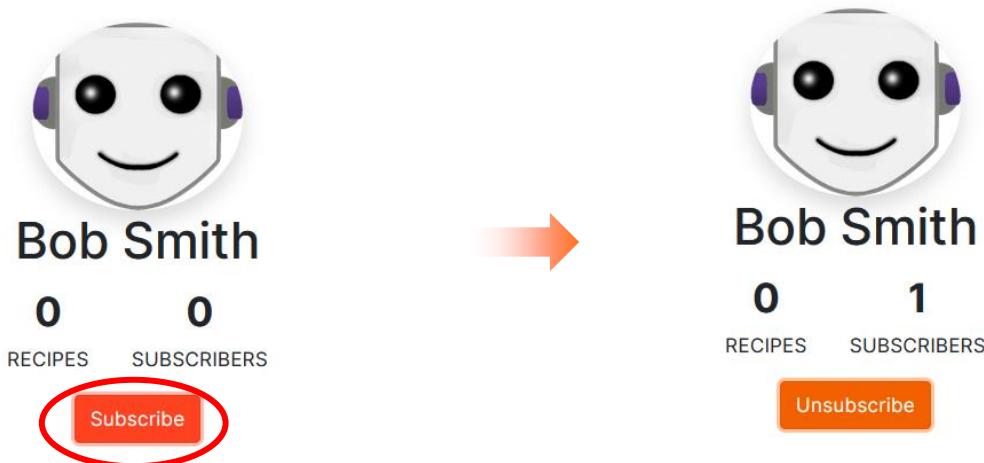
As seen, we have satisfied this project objective by offering search with filtering and granular search options. We have also added an additional feature beyond the objective, search users.

## 2.11 NEWS FEED AND SUBSCRIBING ALLOWING VIEWERS TO SUBSCRIBE TO PARTICULAR CONTRIBUTORS

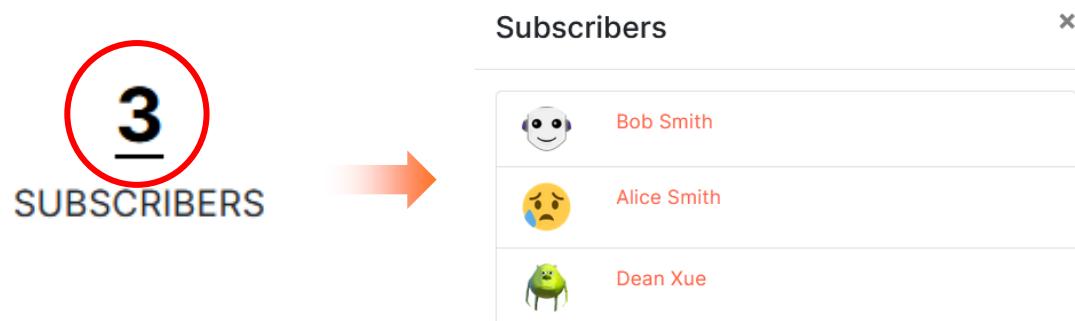
This objective has been satisfied.

### SUBSCRIBING/UNSUBSCRIBING

A user can subscribe to another on their profile. Subscribing will allow their new recipes to show up in this user's newsfeed.



Users can see their subscriptions and subscribers by going on their *own* profile and clicking the respective number:

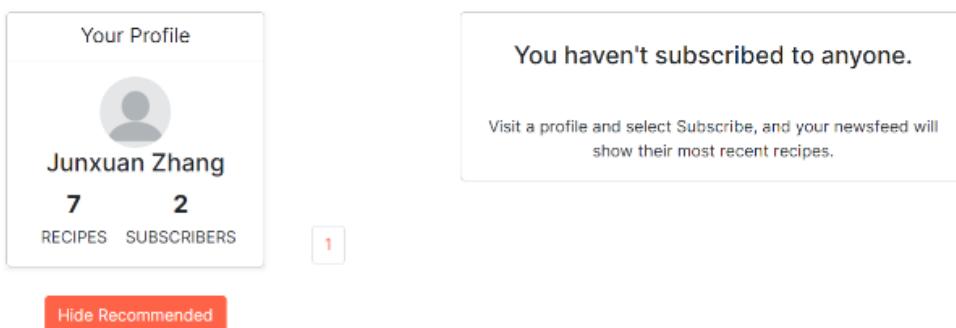


### THE NEWSFEED

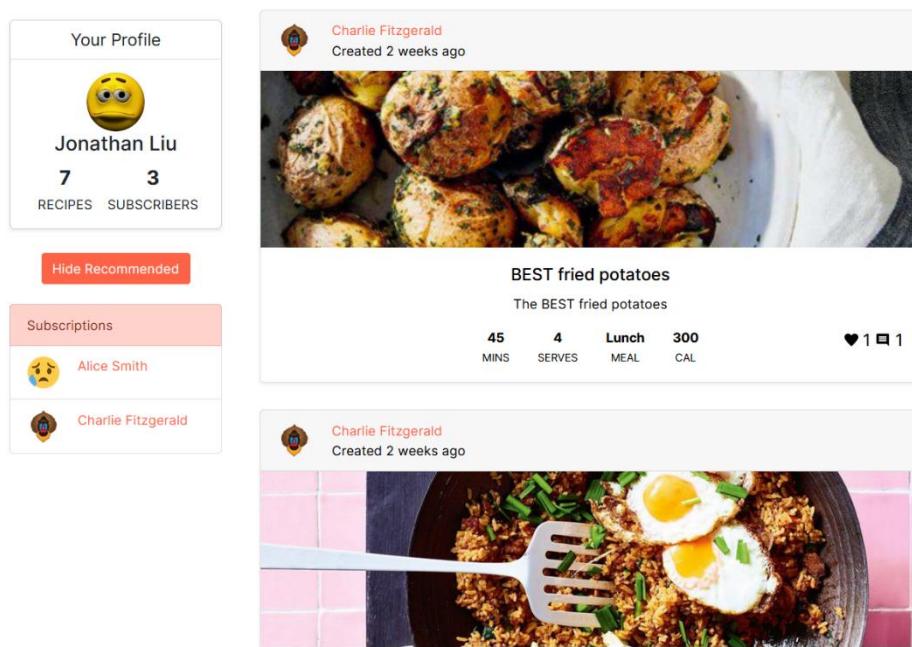
Clicking the "Newsfeed" button on home page to directs users to the Newsfeed page.



If a user has no subscriptions, Newsfeed will show a message which asks them to subscribe to someone.



If user has some subscriptions, Newsfeed will show recent recipes of all subscriptions. Additionally, Newsfeed interface has user's information on the left, including their profile name and picture, number of recipes created and number of subscribers.

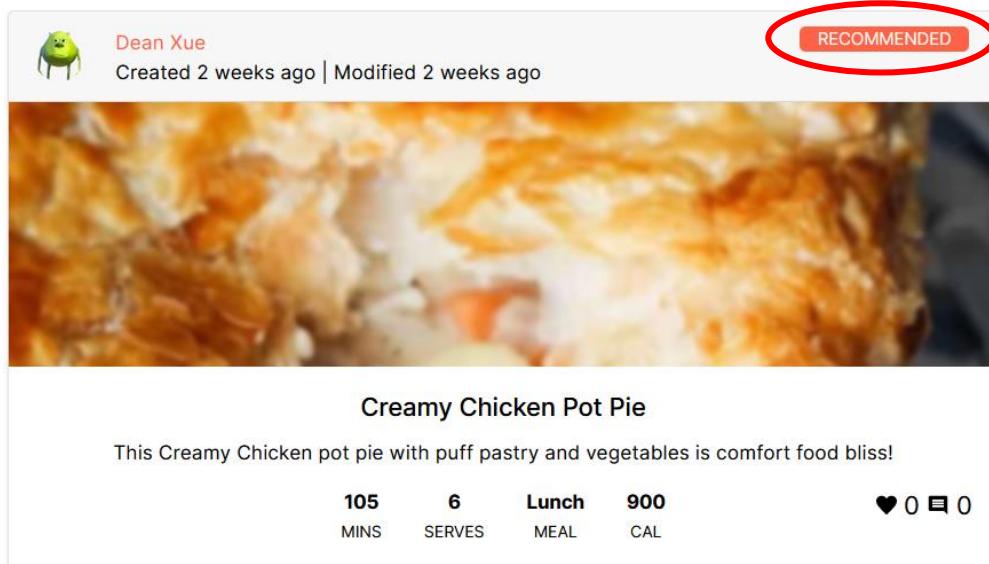


The order of the newsfeed sort is as specified in the project specification:

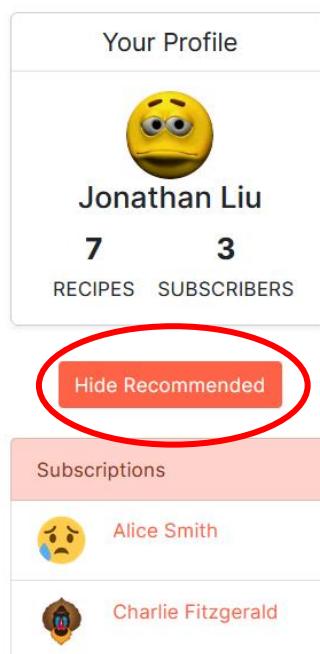
- the recipe creation/update date excluding time component (most recent to oldest), then by the total number of likes that this explorer has for the recipe's contributor profile (highest to lowest count),
- then by the recipe creation/update time (most recent to oldest).

## RECOMMENDATIONS IN NEWSFEED

Newsfeed will include recipes which are not from subscriptions. These are 'recommended' recipes based on the user's search history.



Users can use the "Hide Recommended" button to hide those recipes. They can use "Show Recommended" button later to show those recipes again.



## CONCLUSION

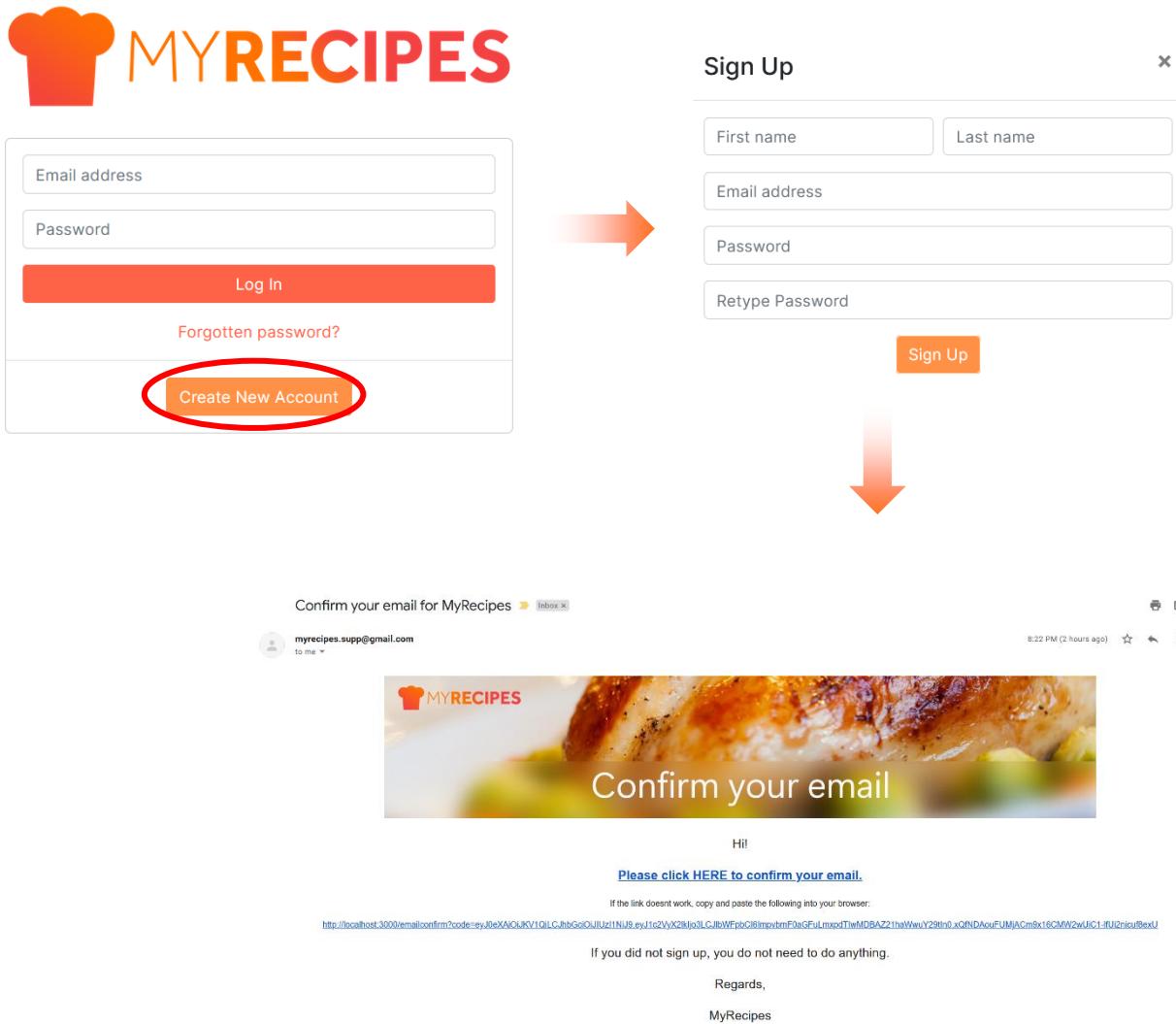
This project objective has been met. Additionally, we have gone beyond the objective by integrating recommendations into the newsfeed, which can be disabled if the user wishes.

## 2.12 SUPPLEMENTARY FUNCTIONALITY: ACCOUNT MANAGEMENT

While not explicitly in our proposal project objectives, this section will demonstrate the account management functionality in MyRecipes, which is, clearly, required for all the other objectives to be functional.

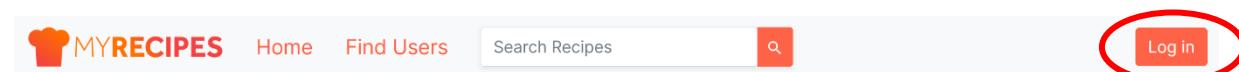
### REGISTERING

The user can register for an account by first accessing the log in page and the clicking 'Create New Account'. The user will then be sent an email with a link to verify their email.



### LOGIN

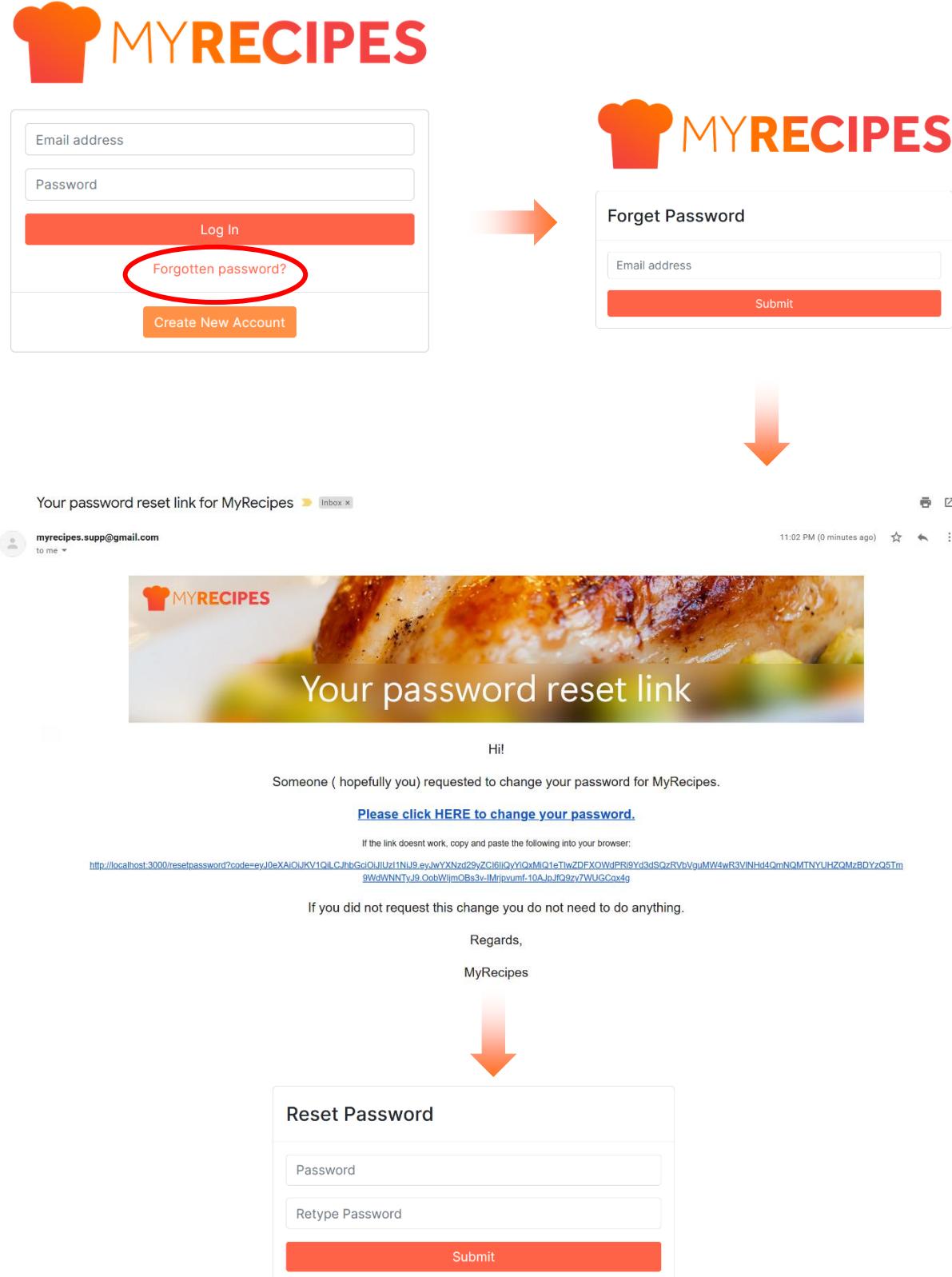
The login page (displayed above) can be accessed by clicking 'Log In' in the top right.





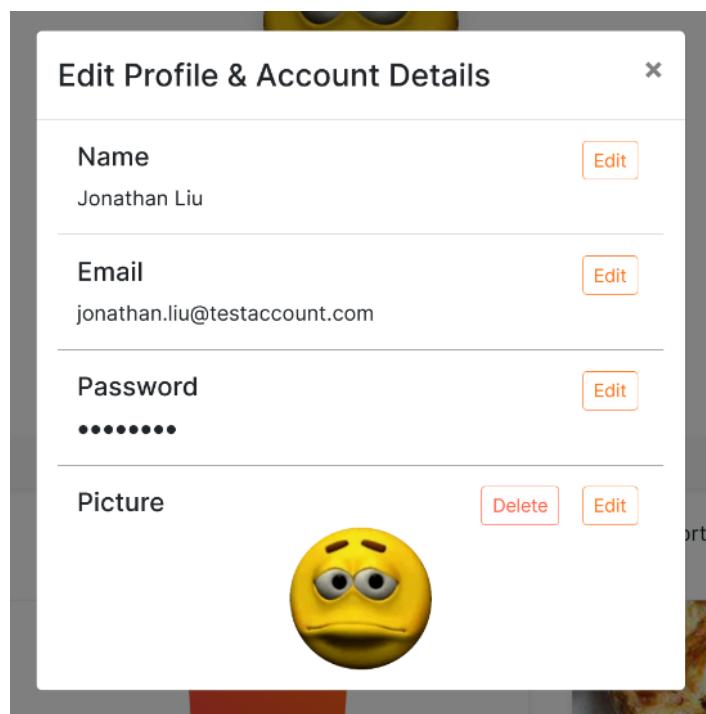
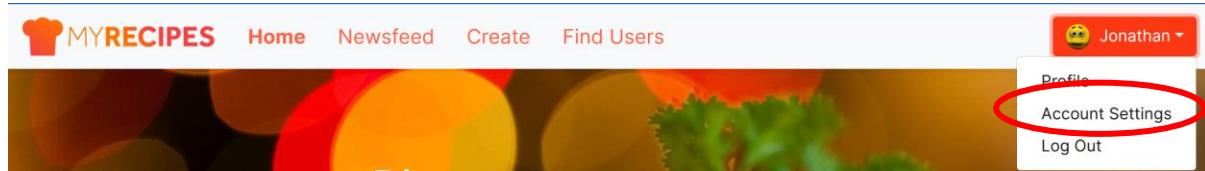
# FORGOT PASSWORD

A user can reset their password by selecting 'Forgotten password' on the login screen, then clicking the link sent to their email.



## ACCOUNT SETTINGS

The Account Settings page is accessible from the top right menu for logged in users.



Edit Profile & Account Details

Name: Jonathan Liu [Edit](#)

Email: jonathan.liu@testaccount.com [Edit](#)

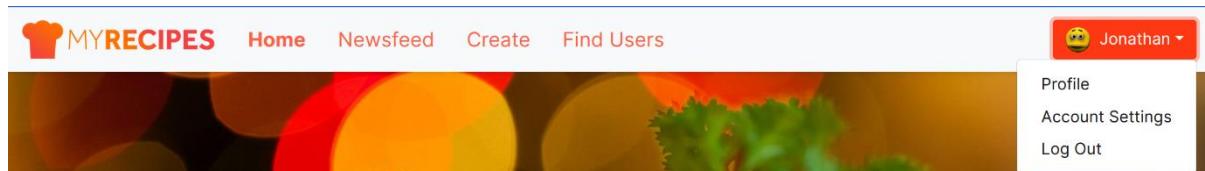
Password: [Edit](#)

Picture: [Delete](#) [Edit](#)

From here, a user can modify their name, email, password and profile picture.

## LOGGING OUT

A user can log out from the top right menu



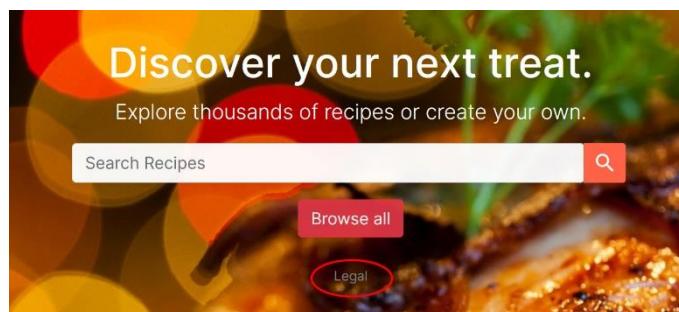
## 2.13 CONCLUSION

We are satisfied that our system has fully met all projective objectives specified in our proposal. In some cases (e.g. profile or searching) we exceeded the objective requirements. Furthermore, an analysis of the acceptance criteria and user stories on our Jira page suggests that all acceptance criteria and user stories have been met.

### 3 THIRD PARTY SOFTWARE AND LICENSES

This section describes all third party libraries and APIs we used, along with the licences we must abide by.

It is mentioned in the licence discussions below that we include legal notices within our software. All legal notices are found on the legal page, accessible by the link under the 'Browse All' button on the homepage.



#### 3.1 FRONT-END



##### REACT

React is popular for web development due to its ease of creating dynamic web applications. We mentioned in the proposal how it is built upon JavaScript, HTML and CSS<sup>1</sup> which appeals to less experienced front-end web developers, as opposed to Angular which has a steep learning curve, making it suitable for our purposes. After using React to build our frontend, we can confirm that it was relatively easy to learn. The virtual DOM, which allows web applications to re-render certain components without having to reload the page,<sup>2</sup> has made our frontend very responsive.

React is under a MIT License<sup>3</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.



##### REACT-BOOTSTRAP

React-Bootstrap is built upon the popular Bootstrap framework, which consists of CSS and Javascript based design templates for frontend interface components.

<sup>1</sup> Skillcrush. 2021. *React JS—What is It? What is Used For? Why Should You Learn It?* - Skillcrush. [online] Available at: <<https://skillcrush.com/blog/what-is-react-js/>> [Accessed 20 June 2021].

<sup>2</sup> Reactjs.org. 2021. *Virtual DOM and Internals – React*. [online] Available at: <<https://reactjs.org/docs/faq-internals.html>> [Accessed 19 June 2021].

<sup>3</sup> GitHub. 2021. *react/LICENSE at main · facebook/react*. [online] Available at: <<https://github.com/facebook/react/blob/main/LICENSE>> [Accessed 1 August 2021].

React-Bootstrap reproduces those interface components into React components so that there are less dependencies on other JavaScript libraries such as JQuery.<sup>4</sup> MyRecipes relies heavily on the various components included to construct a user-friendly interface that is simple, clean, and responsive.

React-Bootstrap is under a MIT License<sup>5</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

## MATERIAL-UI

Similar to React-Bootstrap, Material-UI is a React UI framework but is instead based on Google's Material Design frontend design language. It is used to supplement React-Bootstrap with components not available in React-Bootstrap such as input sliders and snackbars.

Material-UI is under a MIT License<sup>6</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

## REACT ROUTER

React Router is a React library for navigational components which are used to render different components based on the URL or redirect the browser to different URLs. It also provides methods to extract the URL parameter and query parameters which are extensively used in MyRecipes to display the correct information to users. Using React Router has meant that pages don't need to be completely unloaded and reloaded, but components such as the navbar would stay without being reloaded.

---

<sup>4</sup> React-bootstrap.github.io. 2021. *React-Bootstrap*. [online] Available at: <<https://react-bootstrap.github.io/>> [Accessed 1 August 2021].

<sup>5</sup> GitHub. 2021. *react-bootstrap/LICENSE at master · react-bootstrap/react-bootstrap*. [online] Available at: <<https://github.com/react-bootstrap/react-bootstrap/blob/master/LICENSE>> [Accessed 30 July 2021].

<sup>6</sup> GitHub. 2021. *material-ui/LICENSE at next · mui-org/material-ui*. [online] Available at: <<https://github.com/mui-org/material-ui/blob/next/LICENSE>> [Accessed 1 August 2021].

React Router is under a MIT License<sup>7</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.



### REACT CHAT PLUGIN

React Chat Plugin is a React Chatbot component which allows users to enter and send messages, and also receive messages. This component is used in MyRecipes to provide users an interface to connect with our Google Dialogflow implementation, where users can request for assistance with the different functionalities available on the MyRecipes website. It allows for expanding and minimising the UI which is necessary for our implementation.

React Chat Plugin is under a MIT License<sup>8</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.



### REACT BEAUTIFUL DND

React Beautiful DND is a drag and drop list component that allows for natural movement of items. It provides users with a fluid and seamless experience when they need to reorder the photos, directions and ingredients of recipes.

React Beautiful DND is under a Apache License 2.0<sup>9</sup> and it permits commercial use, modification, distribution, patent use and private use.

- Under this license, any significant changes made to the software must be stated. In our case, no changes to the software were made, we only use it as a library, so this is not required.<sup>10</sup>

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<sup>7</sup> GitHub. 2021. *react-router/LICENSE at master · ReactTraining/react-router*. [online] Available at: <<https://github.com/ReactTraining/react-router/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>8</sup> GitHub. 2021. *react-chat-plugin/LICENSE at master · leon0707/react-chat-plugin*. [online] Available at: <<https://github.com/leon0707/react-chat-plugin/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>9</sup> GitHub. 2021. *react-beautiful-dnd/LICENSE at master · atlassian/react-beautiful-dnd*. [online] Available at: <<https://github.com/atlassian/react-beautiful-dnd/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>10</sup> Tldrlegal.com. 2021. *Apache License 2.0 (Apache-2.0) Explained in Plain English - TLDRLegal*. [online] Available at: <[https://tldrlegal.com/license/apache-license-2.0-\(apache-2.0\)](https://tldrlegal.com/license/apache-license-2.0-(apache-2.0))> [Accessed 1 August 2021].

- The license also requires any NOTICE file in the original distribution to be included in the software. React Beautiful DND provides no such NOTICE file and so this is not required.<sup>11</sup>
- Since the copyright notice and permission notice is included in our software,<sup>12</sup> this license does not impact this project even in a commercial deployment.

## React-TimeAGO

### REACT TIME AGO

React Time Ago provides an easy way to convert time objects into relative time, e.g. "X hours ago". We use this instead of writing our own function/component because it supports a multitude of different output formats and saves us time.

React Time Ago is under a MIT License<sup>13</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

## universal-cookie

### UNIVERSAL COOKIE

Universal Cookie allows the storage and retrieval of cookies stored on the browser. This library is used to store the user login token as it serves as an authentication so that the user can remain logged in and access features for registered users.

Universal Cookie is under a MIT License<sup>14</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

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<sup>11</sup> Ibid.

<sup>12</sup> Ibid.

<sup>13</sup> GitHub. 2021. *react-timeago/LICENSE at master · nmn/react-timeago*. [online] Available at: <<https://github.com/nmn/react-timeago/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>14</sup> GitHub. 2021. *cookies/LICENSE at master · reactivestack/cookies*. [online] Available at: <<https://github.com/reactivestack/cookies/blob/master/LICENSE>> [Accessed 1 August 2021].



## REACT-BOOTSTRAP TYPEAHEAD

React Bootstrap Typeahead is an autocomplete search library, inspired by that of Twitter.<sup>15</sup> This is used in MyRecipe's search functionalities, where it suggests the recent search terms users had used. This allows searching to be more convenient since users tend to search the same content within a short time frame.

React Bootstrap Typeahead is under a MIT License<sup>16</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

### Donaldcwl/browser-image-compression BROWSER IMAGE COMPRESSION

**image-compression** Browser Image Compression is used to compress an image file on the client-side in order to limit the maximum size of an uploaded image. Not only does this reduce the network traffic but also allows for a more responsive website experience, since compressed images will be uploaded and downloaded quicker.

Browser Image Compression is under a MIT License<sup>17</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.



## REACT HELMET ASYNC

React Helmet Async is primarily used to easily provide dynamic website titles to each page.

React Helmet is under a Apache License 2.0<sup>18</sup> and it permits commercial use, modification, distribution, patent use and private use.

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<sup>15</sup> GitHub. 2021. *GitHub - ericgio/react-bootstrap-typeahead: React typeahead with Bootstrap styling*. [online] Available at: <<https://github.com/ericgio/react-bootstrap-typeahead>> [Accessed 1 August 2021].

<sup>16</sup> GitHub. 2021. *react-bootstrap-typeahead/LICENSE at master · nmn/react-timeago*. [online] Available at: <<https://github.com/ericgio/react-bootstrap-typeahead/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>17</sup> GitHub. 2021. *browser-image-compression/LICENSE at master · Donaldcwl/browser-image-compression* [online] Available at: <<https://github.com/Donaldcwl/browser-image-compression/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>18</sup> GitHub. 2021. *react-helmet-async/LICENSE at master · staylor/react-helmet-async*. [online] Available at: <<https://github.com/staylor/react-helmet-async/blob/master/LICENSE>> [Accessed 1 August 2021].

- Under this license, any significant changes made to the software must be stated. In our case, no changes to the software were made, we only use it as a library, so this is not required.<sup>19</sup>
- The license also requires any NOTICE file in the original distribution to be included in the software. React Helmet Async provides no such NOTICE file and so this is not required.<sup>20</sup>
- Since the copyright notice and permission notice is included in our software,<sup>21</sup> this license does not impact this project even in a commercial deployment.

### 3.2 BACK-END



#### FLASK

 Flask Flask is a Python micro web framework and is built for rapid development. It is lightweight and provides a simple solution to RESTful HTTP request handling, which is suitable for a large project in a relatively short time frame, like MyRecipes.

Flask is under a BSD 3-Clause License and it permits commercial use, modification, distribution and private use. Since the copyright notice and disclaimer is included in the software documentation and the software, this license does not impact this project even in a commercial deployment.



#### PYMYSQL

 PyMySQL is a Python MySQL client library. MyRecipes relies on this library to allow the backend to connect to a MySQL database and execute queries.

PyMySQL is under a MIT License<sup>22</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.

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<sup>19</sup> Tldrlegal.com. 2021. *Apache License 2.0 (Apache-2.0) Explained in Plain English - TLDRLegal*. [online] Available at: <[https://tldrlegal.com/license/apache-license-2.0-\(apache-2.0\)](https://tldrlegal.com/license/apache-license-2.0-(apache-2.0))> [Accessed 1 August 2021].

<sup>20</sup> Ibid.

<sup>21</sup> Ibid.

<sup>22</sup> GitHub. 2021. *PyMySQL/LICENSE at master · PyMySQL/PyMySQL*. [online] Available at: <<https://github.com/PyMySQL/PyMySQL/blob/master/LICENSE>> [Accessed 1 August 2021].

 PYJWT

PyJWT is a Python library that encodes JSON Web Tokens. This library is critical for MyRecipes since the HTTP messages between the front-end and back-end are of JSON type. PyJWT is used for generating tokens for authentication purposes.

PyJWT is under a MIT License<sup>23</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice and permission notice is included in our software, this license does not impact this project even in a commercial deployment.



## BCRYPT

Bcrypt is a password hashing function and has a Python library available. MyRecipes uses this library to hash and salt the users' passwords to keep the platform secure. Even if unauthorised access is gained to the password hashes, the hashes are effectively useless with this encryption method. Even if two passwords are the same, they will have a different hash because of the salt.

Bcrypt is under a Apache License 2.0<sup>24</sup> and it permits commercial use, modification, distribution patent use and private use.

- Under this license, any significant changes made to the software must be stated. In our case, no changes to the software were made, we only use it as a library, so this is not required.<sup>25</sup>
- The license also requires any NOTICE file in the original distribution to be included in the software. Bcrypt provides no such NOTICE file and so this is not required.<sup>26</sup>
- Since the copyright notice and permission notice is included in our software,<sup>27</sup> this license does not impact this project even in a commercial deployment.

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<sup>23</sup> GitHub. 2021. *pyjwt/LICENSE at master · jpadilla/pyjwt*. [online] Available at: <<https://github.com/jpadilla/pyjwt/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>24</sup> GitHub. 2021. *bcrypt/LICENSE at main · pyca/bcrypt*. [online] Available at: <<https://github.com/pyca/bcrypt/blob/main/LICENSE>> [Accessed 1 August 2021].

<sup>25</sup> Tldrlegal.com. 2021. *Apache License 2.0 (Apache-2.0) Explained in Plain English - TLDRLegal*. [online] Available at: <[https://tldrlegal.com/license/apache-license-2.0-\(apache-2.0\)](https://tldrlegal.com/license/apache-license-2.0-(apache-2.0))> [Accessed 1 August 2021].

<sup>26</sup> Ibid.

<sup>27</sup> Ibid.



Pillow is a Python library used to open and manipulate image files. MyRecipes uses this library to read the incoming image files from the front-end and write it to an appropriate image file type.

Pillow is under an open source HPND Licens<sup>28</sup> and it permits commercial use, modification, distribution and private use. Since the copyright notice appears in the software and the documentation, this license does not impact this project even in a commercial deployment.

### 3.3 DATABASE



#### MYSQL

 MySQL is a relational database management system (RDBMS)<sup>29</sup> For MyRecipes, a RDBMS is preferred over NoSQL database systems such as MongoDB because there are close relations between the recipe data and user data, and therefore a RDBMS will allow for faster transactions. This has greatly reduced duplicate data in our database as well. MySQL was chosen over other RDBMS because our team was familiar with it and it has a long proven track record of reliability and efficiency.

MySQL is under a GNU General Public v2 License<sup>30</sup> and it permits commercial use and private use. The following conditions apply:<sup>31</sup>

- Any modifications require to MySQL code require the resulting software to be under the same GNU terms or a licensing fees not be paid. In MyRecipes, no modification of MySQL code was made. We simply *use* MySQL as our database. Therefore, this does not apply.
- Any distributions of the MySQL code require including the original software or instructions to obtain copies. We do not distribute MySQL code with MyRecipes so this is not required.
- Any significant changes to MySQL code will need to be disclosed. Again, in MyRecipes, no modifications of the MySQL code is made, so this is not required.

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<sup>28</sup> GitHub. 2021. *Pillow/LICENSE at master · python-pillow/Pillow*. [online] Available at: <<https://github.com/python-pillow/Pillow/blob/master/LICENSE>> [Accessed 1 August 2021].

<sup>29</sup> Dev.mysql.com. 2021. *MySQL :: MySQL 8.0 Reference Manual :: 1.2.1 What is MySQL?*. [online] Available at: <<https://dev.mysql.com/doc/refman/8.0/en/what-is-mysql.html>> [Accessed 19 June 2021].

<sup>30</sup> GitHub. 2021. *mysql-server/LICENSE at 8.0 · mysql/mysql-server*. [online] Available at: <<https://github.com/mysql/mysql-server/blob/8.0/LICENSE>> [Accessed 1 August 2021].

<sup>31</sup> Tldrlegal.com. 2021. *Apache License 2.0 (Apache-2.0) Explained in Plain English - TLDRLegal*. [online] Available at: <[https://tldrlegal.com/license/apache-license-2.0-\(apache-2.0\)](https://tldrlegal.com/license/apache-license-2.0-(apache-2.0))> [Accessed 1 August 2021].

Since we have included the licence and copyright notice in our software, there is no barrier to using MySQL even for commercial purposes, without paying a fee.

### 3.4 API



NUTRITIONIX

Nutritionix provides comprehensive nutritional information on food items and boasts a nutrition database of 995,726 food items.<sup>32</sup> Nutritionix was chosen primarily because of its natural language search capacity, which allows us not to worry about units of quantity and just feed in the foods and quantities where it will be processed automatically. Nutritionix has proven to be reliable and fast, and very rarely does it miss a food item given its large database.

The licence<sup>33</sup> to use the API has presented the following implications to MyRecipes:

- The license permits us to use the API and interface with it in MyRecipes, specifically in our case to 'develop, reproduce, display and distribute applications, websites and/or services'.
  - None of the restrictions as to the primary purposes of our software apply to MyRecipes.
- However, and importantly, the licence prohibits the *caching or storage* of the data returned by the API. This means we cannot calculate the nutrition for a recipe once, and then store it in our database. We need to ping the Nutritionix API every time.
- We are able to store an *estimate* (nearest 100) calorie count on every recipe as this is not the data returned by the API.
- However the inability to store the full nutritional information data means reduced performance and increased API uses.
  - The number of API hits now grows with views instead of number of recipes, increasing cost.
- Further, we need to indicate that the system is powered by Nutritionix and include a link.
  - We have done this on the frontend (see right)

Nutritional Info per serving	
Calories	634
Fat	31.6 g
Saturated	11.3 g
Cholesterol	115 mg
Sodium	970.1 mg
Potassium	1230.6 mg
Carbohydrates	40.2 g
Sugar	8.5 g
Dietary fibre	4.7 g
Protein	12.1 g

powered by  a Syndigo Company

<sup>32</sup> Nutritionix.com. 2021. *Nutritionix – Largest Verified Nutrition Database* [online] Available at: <<https://www.nutritionix.com/>> [Accessed 20 June 2021].

<sup>33</sup> Nutritionix. 2021. *Nutritionix- API Terms and Conditions*. [online] Available at: <<https://www.nutritionix.com/apiterms>> [Accessed 1 August 2021].



## DIALOGFLOW

DialogFlow was chosen to provide the chatbot functionality. It was chosen because of the robustness of Google's machine learning, and the amount of data Google has, thus is likely to produce more reliable results to many different queries. It is also quite easy to train. Furthermore, queries can be customised at the backend level as DialogFlow can not only provide set responses, but also indicate to the backend of certain intents which can be processed. This for example allows us to search directly in the chatbot.

The license<sup>34</sup> to use the API has presented the following implications to MyRecipes:

- The license permits us to use the API for commercial and private use
- The license prohibits distribution such as creating a public API to re-route queries to DialogFlow.
  - Users will be sending the queries directly to the DialogFlow API, so there is no violation of this term.

### 3.5 LICENSING - CONCLUSION

The analysis of the licensing considerations above suggest that MyRecipes can be fully deployed even in a commercial environment, so long as the legal notices are kept to date. So long as the data from Nutritrionix is not stored, there are no further legal issues.

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<sup>34</sup> Google Cloud. 2021. *Google Cloud Platform Terms Of Service*. [online] Available at: <<https://cloud.google.com/terms>> [Accessed 1 August 2021].

## 4 TECHNICAL CHALLENGES AND ALGORITHMS

### 4.1 SEARCH ALGORITHM

Searching algorithms are a very difficult algorithm to get correct. Specifically, recipes provide a unique use case where no existing algorithm exists. The algorithm below uses just 3 queries to the database, minimising load times and increasing scalability. This algorithm is based on empirical observation to see which would produce the most relevant results. The search algorithm for basic searches is based on 3 stages.

#### STAGE 1: NAME MATCHES BASED ON RELEVANCE

The search algorithm first searches for matching recipe names based on MySQL's computed MATCH AGAINST relevance score. This provides the most relevant matches for the matching recipe names.

#### STAGE 2: INGREDIENT MATCHES

The search algorithm next begins by doing a deep search of all recipe ingredients. If an ingredient matches the search keyword/s, it will be added to the search results. The results for this stage are ordered based on the *number of ingredients* in a recipe that match the keyword/s.

#### STAGE 3: STEP KEYWORD MATCHES

Finally, the search algorithm does a deep search of all recipe steps. If a word within the step matches the search keyword/s, it will be added to the search results. The results for this stage are ordered based on the *number of steps* in a recipe that match the keywords.

#### ORDER OF STAGES

Stage 1 results are prioritised. That is, all name matches will appear before the first ingredient match. Stage 2 is prioritised over Stage 3. That is, all ingredient matches will appear before step matches.

#### ADVANCED SEARCHES

If an advanced search is used, stages 2 and 3 no longer apply to the 'name' field. In other words, the algorithm does not include ingredient and step matches for the 'name' field, in advanced searches.

## 4.2 HYBRID NAME-INGREDIENT BASED RECIPE RECOMMENDATION

The following recommendation algorithm is based on empirical testing to check which would produce the best recommendations.

For a given recipe, at most 3 recipe recommendations are generated based on 2 criteria: recipe name and recipe ingredients. Using MySQL's natural language search, we match the name of the given recipe with the database of recipes and obtain the recipes with the highest relevance value, i.e. the recipes that are most similar to the given recipe. However, this criteria alone may not always fulfil three recipes since there may be cases where there are no or insufficient other similar recipes names to the given recipe. An ingredient-based recommendation system is proposed which is centered on the Jaccard Index. The Jaccard Index calculates the similarity between two sets by taking the ratio of the set intersection over the set union:

$$J(A, B) = \frac{|A \cap B|}{|A \cup B|}$$

In the case of MyRecipes, a set is the list of ingredient names for a recipe. The intersection is the list of ingredients with similar names and the union is the combined list of unique ingredients. Recipes are ranked based on this similarity measure and the top-ranking recipes are selected.

## 4.3 SEARCH HISTORY-BASED NEWSFEED RECOMMENDATIONS

As a user performs searches, the system stores the most recent 10 search terms and incorporates them into recommending recipes on the user's newsfeed. The search terms are used to retrieve recipes with similar names, but recipes which belong to the user or are written by the user's subscriptions will be omitted in order to prevent repetition. The recommended recipes are ordered based on the following criteria sequence: date of search term, creation date of recipe, number of likes of recipe, creation time of recipe. They are then split across the several pages of a user's newsfeed to prevent excessive concentration of recommendations on a single page. A maximum of 2 recommended recipes will be shown on each page.

## 4.4 DIFFICULTIES: LEARNING NEW LANGUAGES AND FRAMEWORKS

A major difficulty was the fact that no team members had substantial frontend experience. Despite us choosing a relatively easy-to-learn frontend framework: React, significant work had to be done just to learn how to get a frontend working. This

contrasts with, for example, our backend, which all team members had prior knowledge for, and the database, which one team member had substantial experience in.

To overcome this, we did the following.

1. One team member had *some* experience with writing Javascript and React code. We let him start off learning and writing the entire frontend for Sprint 1.
2. This enabled other team members to read and re-use the patterns that he used for Sprint 1. Thus, in Sprint 2-5, other team members simply learnt from and built on top of the original basic frontend built in Sprint 1.

This process of learning off others code greatly helped us progress through the sprints without excessive time researching or learning a new language/framework.

## 4.5 ASYNC FUNCTIONS IN REACT

We found it hardest to understand the concepts of asynchronous functions and React Hooks.

At first, we were confused as to why even though we were calling the back-end API, we were unable to receive any responses. We realised that it was due to the program not waiting for the API response before proceeding to the next instructions and hence came to learn of asynchronous functions. Asynchronous function lets the program know that it should wait for the function to complete before carrying on.

We needed the website to be dynamic such that the parts of the page should be able to change rather than refreshing the whole page. React Hooks, in particular the State Hook and Effect Hook, were able to solve this problem. The State Hook allows adding states to different components and the component is able to show or manipulate the data stored in the states. The Effect Hook allows the page to continue running asynchronous functions even after the page has already been rendered. Both these hooks enabled the website to be more responsive and improved the user experience.

## 4.6 CHATBOT DESIGN

This section describes the structure and strategy used to design our chatbot.

1. Project uses Dialogflow ES which is much easier for training and management than other versions.
2. Contains 15 detailed intents to detect user's thought and meaning.

3. Creates 4 “entities” which contain most common recipe’s names, ingredients, cooking methods and types. The chatbot can automatically find existing “entities” in user’s input message and detect user’s intent accordingly.
4. Each intent is trained by more than 10 different expression ways.
5. Chatbot also contains context detection for better customer experience.
6. Backend can get intent type from the API and do extra operations such as searching and sending support email.
7. For searching, chatbot will detect “entities” in the input message and return them as JSON format to the backend. Then backend calls the same search function of search functionality with those entities as parameters and sends results to user.

#### 4.7 DESIGNING FOR SCALE: DATABASE CONCURRENCY

Flask, by default, uses multiple threads to allow concurrent users to send and receive. However, an issue we encountered early in development is the fact that the PyMySQL implementation is *not* thread safe per connection.<sup>35</sup> This led to many confusing concurrency issues where MySQL would report packets being out of order.

For the majority of development cycle, a makeshift temporary solution was used: the use of a global lock to ensure mutual exclusion to any database access. Of course, this solution was not scalable. Only one user could perform a query at a time—so if there were many users trying to use the system it would be slow.

In Sprint 4 a permanent solution consisting of a connection management function was implemented to allow concurrency again. While each *connection* is not thread safe, multiple connections are thread safe with each other, since MySQL has robust concurrent query handling. This method has allowed concurrency requests and queries to be supported again, greatly increasing MyRecipes’ ability to scale to many users.

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<sup>35</sup> Py4u.net. 2021. *Is pymysql connection thread safe? Is pymysql cursor thread safe?*. [online] Available at: <<https://www.py4u.net/discuss/791558>> [Accessed 2 August 2021].

## 5 TECHNICAL USER MANUAL

### 5.1 INSTALLATION

The following instructions specify how to install MyRecipes.

#### INSTALLATION NOTES

- Please install MyRecipes on the Lubuntu 20.4.1 LT virtual machine image, **not** VLAB.
- The virtual machine should be in the fresh, original state with nothing installed.

#### AUTOMATIC INSTALLATION PROCESS

- Run the automatic install script with `sudo sh install.sh`
  - You will need to enter `lubuntu` as the superuser password.
  - This script can take approximately 10 minutes to run.
  - **If you are prompted to enter the password, please enter `lubuntu`**
  - The script will inform you of progress after each step is completed.

#### MANUAL INSTALLATION PROCESS

If, for some reason the automatic installation process fails to work or run, please install MyRecipes manually by running the following commands:

##### DATABASE

```
sudo apt-get update
sudo apt-get -y install mysql-server
service mysql start
mysql < ./db/schema.sql
mysql -p myrecipes < ./db/dump.sql
```

##### BACKEND

```
apt-get -y install python3-pip
pip3 install -r ./requirements.txt
```

##### FRONTEND

```
apt-get -y install nodejs
apt-get -y install npm
npm install --prefix ./frontend_react ./frontend_react
```

## 5.2 RUNNING

Please follow these steps to run MyRecipes:

1. Open two terminal windows. In both, cd to the project directory.
2. In any terminal window, ensure the MySQL service is running with `sudo service mysql status`. If it is not running, run it with `sudo service mysql start`
  - ① Once the service is running, the database is now operational.
3. In the first terminal window, `cd backend`
4. In the first terminal window, run the backend with `python3 server.py`
  - ① The backend is now operational in the first terminal window.
5. In the second terminal window, `cd frontend_react`
6. In the second terminal window, run the frontend with `npm start`
  - ① The frontend is now operational in the second terminal window.

After step 6 your browser should have opened with MyRecipes. If not, open your browser and head to `localhost:3000`.

## 5.3 SAMPLE DATA

Sample data (including sample recipes, logins, profiles, etc) is included in the automatic installation process and manual installation process.

### LOGINS

The sample data contains 5 users. You can log in to any of the users with the details below:

Username	Password
jonathan.liu@testaccount.com	myrecipes
bob.smith@testaccount.com	myrecipes
alice.smith@testaccount.com	myrecipes
charlie.fitzgerald@testaccount.com	myrecipes
dean.xue@testaccount.com	myrecipes

Of course, you can always create a new account using MyRecipes. You will need a legitimate email address to verify your email if you choose to do so.

### CLEARING SAMPLE DATA

If you would like a fresh system without all the sample data, please do the following:

1. Run `rm -rf ./backend/static/server_resources/images`

2. Run `sudo mysql`
3. In `mysql`, run `source [path_to_project]/schema.sql`

## 5.4 IF SOMETHING GOES WRONG: TROUBLESHOOTING

It is not anticipated that there will be any errors while running MyRecipes, as the system has been tested thoroughly.

However, if MyRecipes stops responding or you encounter unexpected behaviour (like things not loading), please first try restarting the backend:

1. In the terminal window where the backend is running, press `Ctrl+C`
2. Run the backend again with `python3 server.py`

Frontend issues are rare. However, if you encounter one, restart the frontend with:

1. In the terminal window where the frontend is running, press `Ctrl+C`
2. Try to reinstall dependencies then run the frontend again with `npm install && npm start`

Database issues are even more rare, but a restart of the database may fix some problems:

```
sudo service mysql stop  
sudo service mysql start
```

You can always contact support using the chatbot: just ask.

## NUTRITIONIX TROUBLESHOOTING

In some cases, Nutritionix interface may display "Failed to fetch nutrition. Try again later".

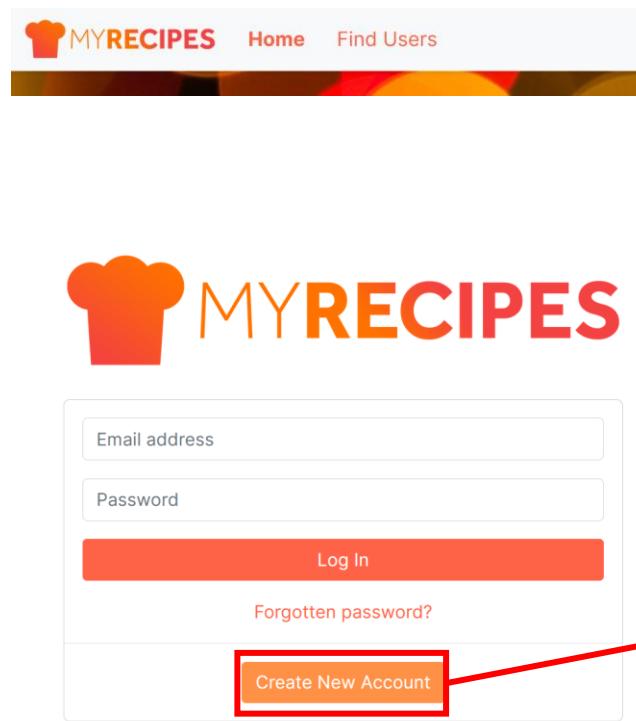
- If your recipe has no legitimate ingredients (i.e. you are just inputting random characters/words for testing purposes) this is expected behaviour. Please try again after inputting 1 or more legitimate ingredients.
- It may be the case that the API limit has been exceeded. Please head to line 566 and take a look at the comments above. Please replace the `x-app-id` value to a different app-id. Please replace the `x-app-key` value with a different key.

## 6 FUNCTIONALITY USER MANUAL

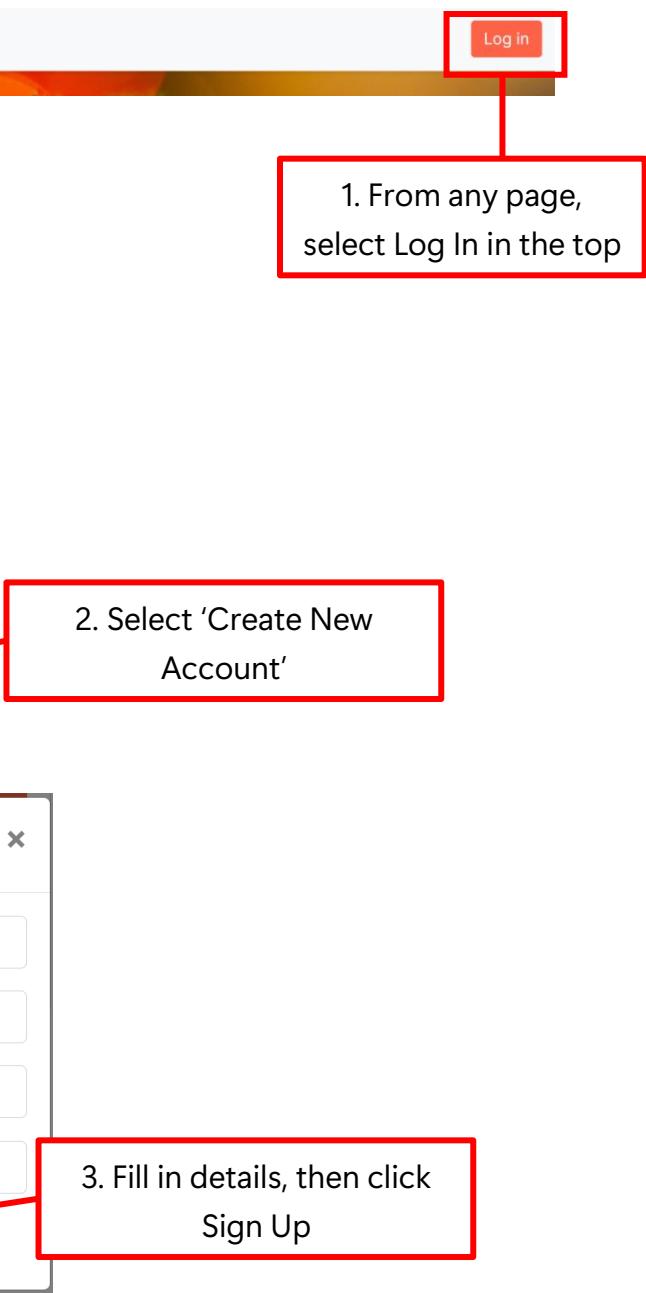
The following section would be what a real-life user manual for MyRecipes would likely look like.

### 6.1 ACCOUNT MANAGEMENT

#### REGISTERING FOR AN ACCOUNT



1. From any page, select Log In in the top right corner.

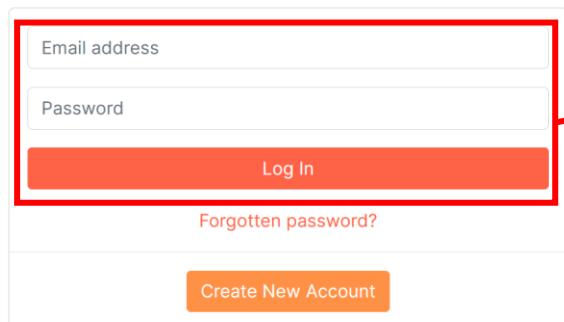
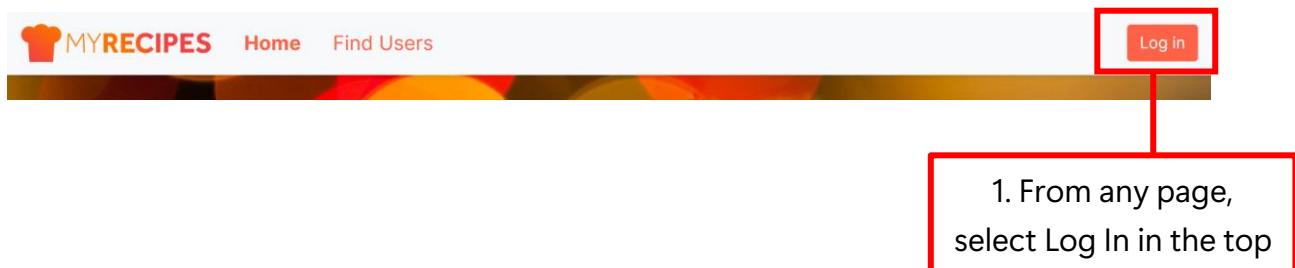


2. Select 'Create New Account'

3. Fill in details, then click Sign Up

4. Now, check your email for a verification link.

## LOGGING INTO AN ACCOUNT



Email address

Password

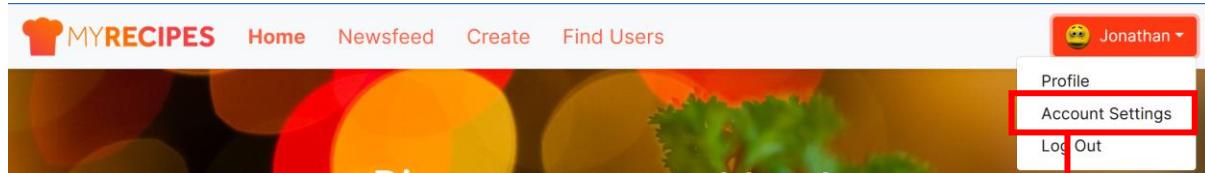
Log In

Forgotten password?

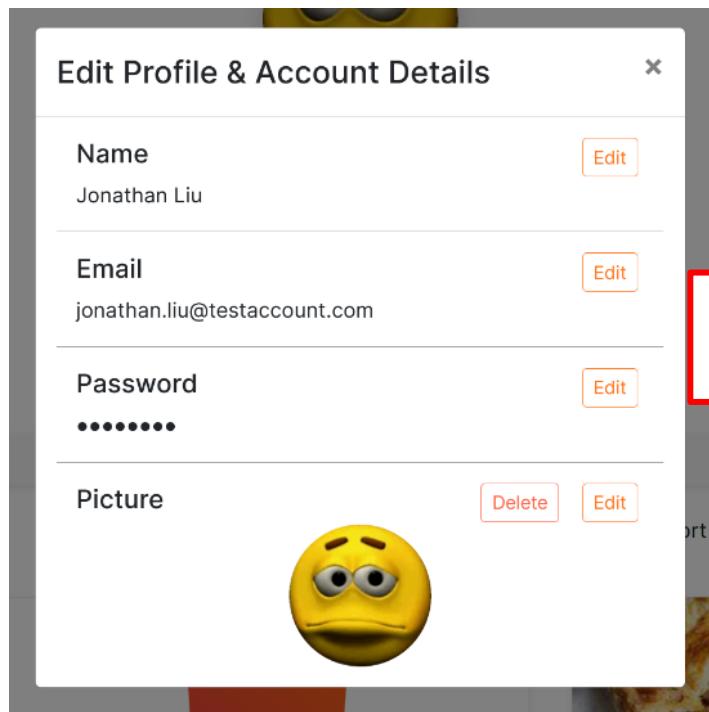
Create New Account

2. Enter details, then click log in.

## CHANGING YOUR ACCOUNT DETAILS



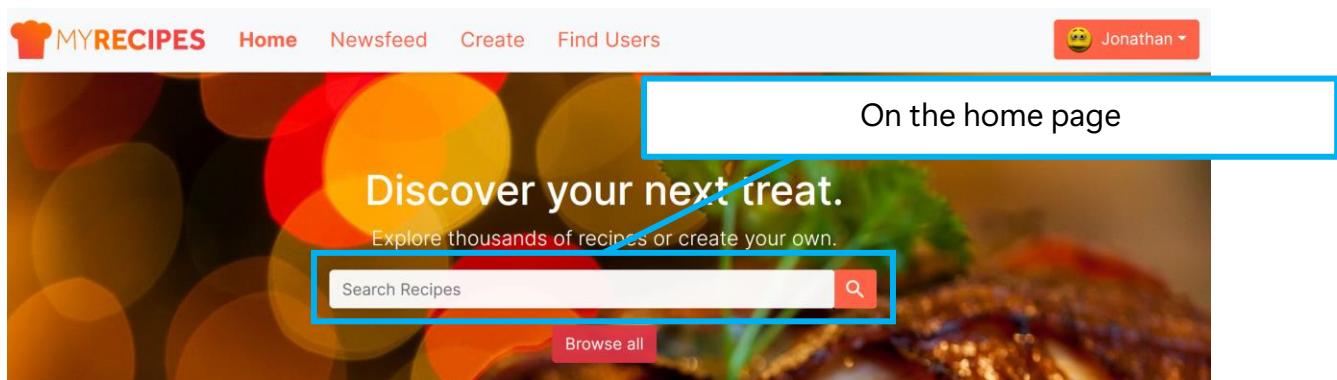
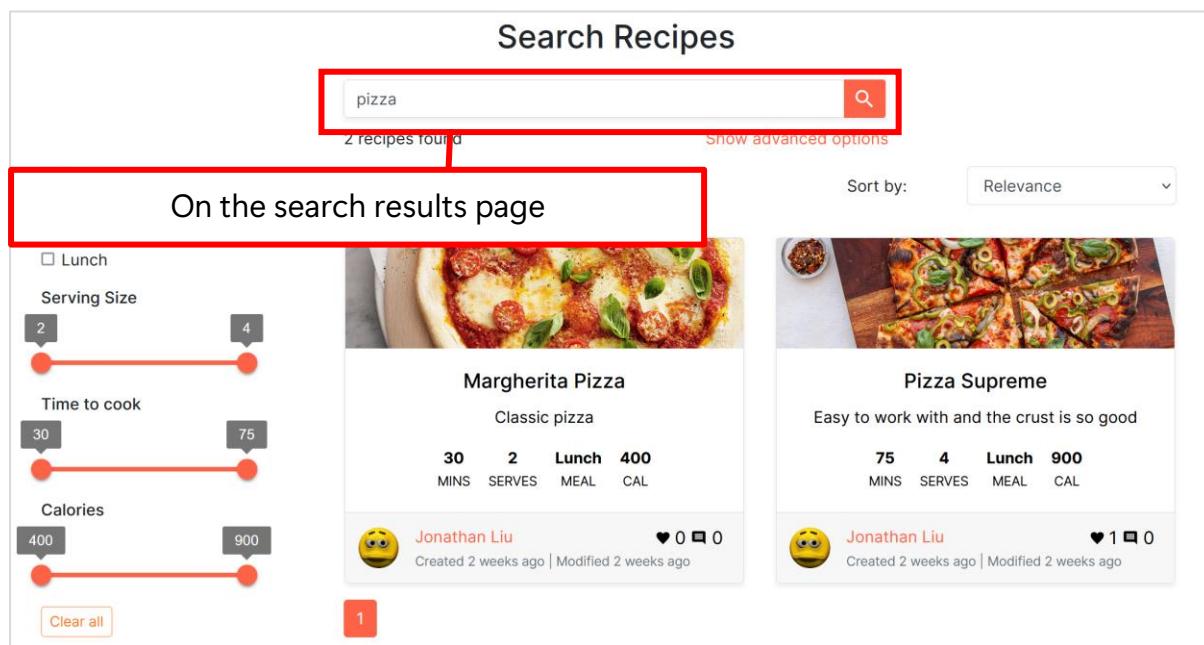
1. After logging in, open the top right menu on any page. Then click Account Settings.



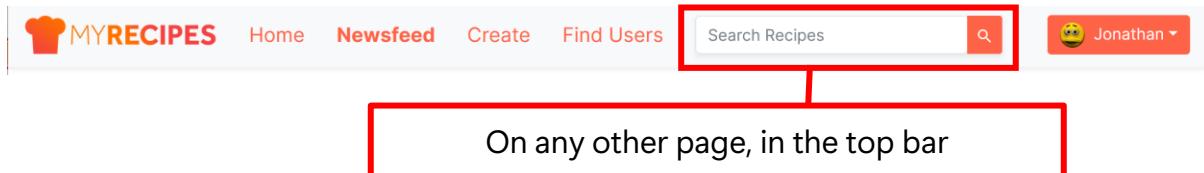
2. The Account Settings menu lets you change your email, password, name and profile picture.

## 6.2 SEARCHING FOR A RECIPE

### SEARCH BAR LOCATIONS

The screenshot shows the MYRECIPES search results page for the query 'pizza'. The search bar at the top contains 'pizza' with a magnifying glass icon. Below the search bar, it says '2 recipes found' and 'Show advanced options'. To the right, there's a 'Sort by:' dropdown set to 'Relevance'. The search results list two recipes: 'Margherita Pizza' and 'Pizza Supreme'. Each result card includes a thumbnail image, the recipe name, a brief description, cooking time, serving size, meal type, and caloric information. Below each card is a user profile for 'Jonathan Liu' with a creation date of 'Created 2 weeks ago | Modified 2 weeks ago'. A red box highlights the search bar area, and the text 'On the search results page' is written above it.



The screenshot shows the MYRECIPES top navigation bar. It includes the MYRECIPES logo, a search bar with the placeholder 'Search Recipes' and a magnifying glass icon, and a user profile for 'Jonathan' with a dropdown arrow. A red box highlights the search bar area, and the text 'On any other page, in the top bar' is written above it.

## BASIC SEARCH

After making a search, the following results page is shown.

**Filter**

Meal type  
 Lunch

Serving Size  

2

4

Time to cook  

30

75

Calories  

400

900

[Clear all](#)

Z

**Filter results here**

1

Move between pages here

After making a search, the following results page is shown.

Enter a basic search here.

You can search for recipe names, ingredients, or step keywords.  
 Results with matching names are prioritised.  
 You can specify exact matches with "quotes" around the keyword.

**Show advanced options**

**Sort by:** Relevance



**Margherita Pizza**  
Classic pizza

30 MINS   2 SERVES   Lunch   400 CAL

 Jonathan Liu   1  0  
Created 2 weeks ago | Modified 2 weeks ago



**Pizza Supreme**  
Easy to work with and the crust is so good

75 MINS   4 SERVES   Lunch   900 CAL

 Jonathan Liu   1  0  
Created 2 weeks ago | Modified 2 weeks ago

70

## ADVANCED SEARCH

**Search Recipes**

Search bar: pizza Show advanced options

2 recipes found

Sort by: Relevance

**Filter**

- Meal type:  Lunch
- Serving Size: 2 to 4
- Time to cook: 30 to 75
- Calories: 400 to 900

**Access advanced options here**



Margherita Pizza  
Classic pizza

30 MINS 2 SERVES Lunch 400 CAL

Jonathan Liu 0 0  
Created 2 weeks ago | Modified 2 weeks ago



Pizza Supreme  
Easy to work with and the crust is so good

75 MINS 4 SERVES Lunch 900 CAL

Jonathan Liu 1 0  
Created 2 weeks ago | Modified 2 weeks ago

Clear all  1

**Search Recipes**

Search bar: pizza Hide advanced options

2 recipes found

Name: pizza

Serving size:

Time to cook:

Meal type:

Ingredients:

Step keywords:

Search

With advanced options, you can specify any arbitrary combination of the fields shown.

For the name, ingredients and step keywords fields you can specify only exact matches by putting "quotes" around the query

## 6.3 VIEWING A RECIPE

**Easy steak pie**

200 MINS    6 SERVES    Lunch MEAL    APPROX CAL 900

**Description**  
Homemade steak pie, complete with golden-brown flaky pastry and a rich filling.

**Ingredients**

- 3 tbsp sunflower oil
- 1 kg braising steak, diced
- 2 onions, roughly chopped
- 3 tbsp plain flour
- 1 tbsp tomato ketchup
- 2 beef stock cubes mixed with boiling water
- 375 grams puff pastry
- 1 egg yolk, beaten

**Nutritional Info per serving**

Calories	924.4
Fat	62.7 g
Saturated	16.6 g
Cholesterol	192.4 mg
Sodium	432.8 mg
Potassium	780.7 mg
Carbohydrates	36.6 g
Sugar	3 g
Dietary fibre	1.5 g
Protein	51.1 g

powered by 

**Steps**

- (Source: [bbcgoodfood.com](#)) To make the filling, heat the oven to 160C/140C fan/gas 3. Heat half the oil in a large casserole dish, brown the meat really well in batches, then set aside. Add the onions adding a drizzle more oil, then cook on a low heat for 5 mins until coloured.
- Scatter over the flour stirring until the flour turns brown. Tip the meat and any juices back into the pan along with the ketchup and give it all a good stir. Pour over the stock, season, and bring to a simmer then cover with a lid and put in the oven for about 2 hrs, until the meat is tender. The filling can be made up to three days ahead and chilled or frozen for up to three months.
- To make the pie, heat the oven to 220C/200C fan/gas 7. Tip the filling into a 24-26cm rimmed pie dish and brush the rim of the dish with some yolk. Unravel the pastry, drape over the dish and use a knife to trim and press the edges against the side of the dish. Re-roll your trimmings to make a decoration if you like. Brush the pie heavily with egg yolk. Make a few little slits in the centre of the pie and bake for 40 mins until golden. Leave to stand for a few minutes before serving.

**Recommendations similar to this recipe**



**Air Fryer Steak**  
Hearty meal for 2

45 MINS    2 SERVES    Dinner MEAL    300 CAL

 Alice Smith  
Created 2 weeks ago



**Apple Pie**  
No description available

60 MINS    8 SERVES    Snack MEAL    500 CAL

 Jonathan Liu  
Created 2 weeks ago



**Sweet and Sour Pork**  
Loaded with tricks the Chinese ha...

30 MINS    4 SERVES    Dinner MEAL    1600 CAL

 Jonathan Liu  
Created 2 weeks ago | Modified 2 weeks ago

View recipe photos here

Use arrows to scroll through images

View contributor details and recipe creation/edit times here

Click contributor view their profile

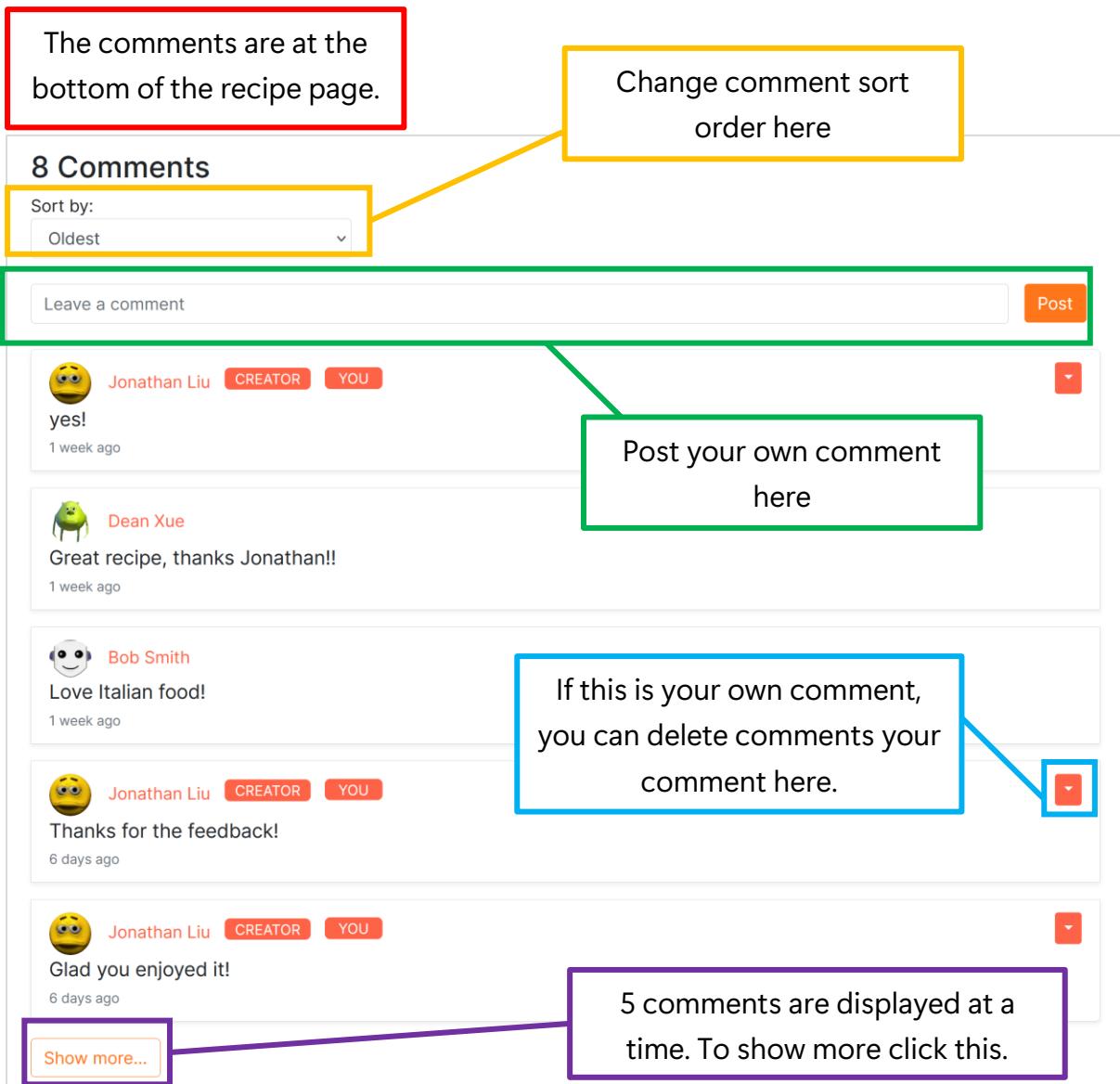
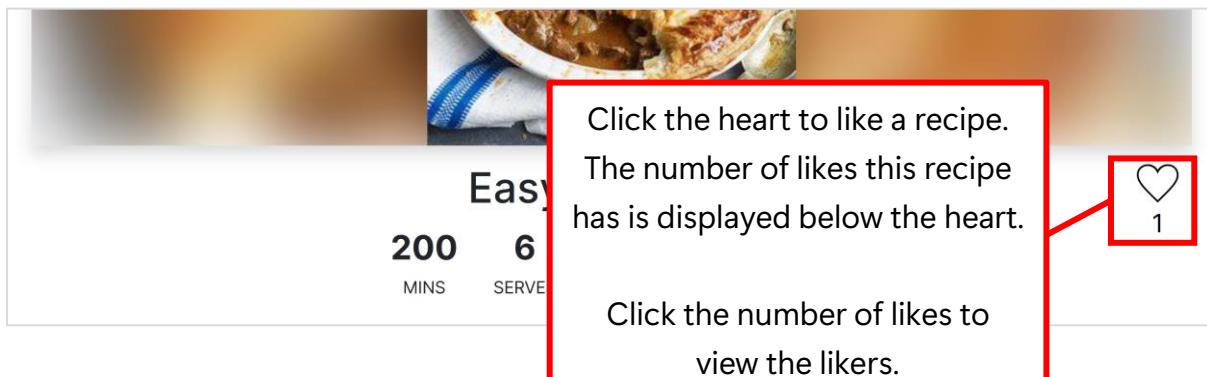
View estimated nutritional information here.

Nutritional values are calculated based on ingredients and quantities.

View recipe recommendations here.

These are recipes with similar ingredients or names.

## 6.4 RECIPE SOCIAL FEATURES



The comments are at the bottom of the recipe page.

8 Comments

Sort by: Oldest

Leave a comment Post

Jonathan Liu CREATOR YOU  
yes!  
1 week ago

Dean Xue  
Great recipe, thanks Jonathan!!  
1 week ago

Bob Smith  
Love Italian food!  
1 week ago

Jonathan Liu CREATOR YOU  
Thanks for the feedback!  
6 days ago

Jonathan Liu CREATOR YOU  
Glad you enjoyed it!  
6 days ago

Show more...

Change comment sort order here

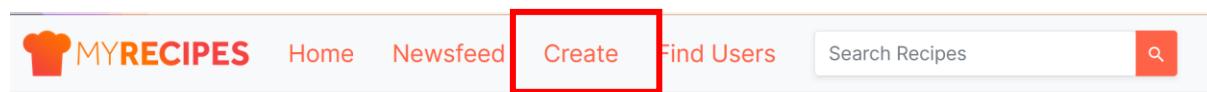
Post your own comment here

If this is your own comment, you can delete comments your comment here.

5 comments are displayed at a time. To show more click this.

This section shows a list of comments for a recipe. A red box highlights the text 'The comments are at the bottom of the recipe page.' A yellow box highlights the 'Sort by' dropdown menu set to 'Oldest'. A green box highlights the 'Leave a comment' input field and 'Post' button. A blue box highlights the 'Post your own comment here' area. A purple box highlights the 'Show more...' button. Callouts point from the text boxes to their corresponding UI elements.

## 6.5 CREATING A RECIPE



1. Log in, then select Create in the top bar.

**Create Recipe**

**▼ Details**

Name

Type  -- Select an option -- Time (minutes)  Serving size

Description

**Next: Ingredients**

- ▶ Ingredients
- ▶ Directions
- ▶ Photos

**2. Enter recipe details, then click Next.**

Change the order or delete ingredients here

**▼ Ingredients**

1	<input type="text" value="1"/>	<input type="button" value="▼"/>	example	example
2	<input type="text" value="2"/>	<input type="button" value="▼"/>	example	example

**Add**

**Next: Directions**

**3. Enter recipe ingredients, then click next**

Add a new ingredient here

**▼ Directions**

Directions

1	Details	≡	x
2	Details	≡	x
		Add	

Next: Photos

**4. Repeat step 3 for recipe directions**

**▼ Photos**

Photos

Browse... No file selected.

Add

**5. Repeat step 3 for photos.**

Create Recipe

**6. Select 'Create Recipe'**

*Note. You can re-expand completed sections by clicking the relevant section*

- Details
- Ingredients
- Directions
- Photos

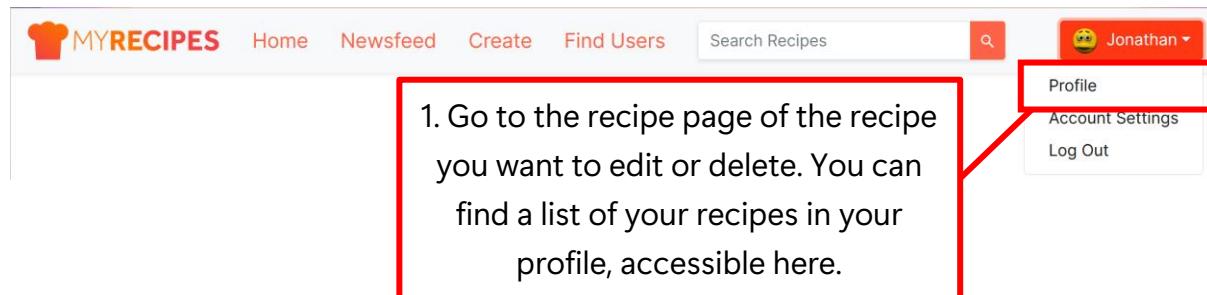
**▼ Ingredients**

Ingredients

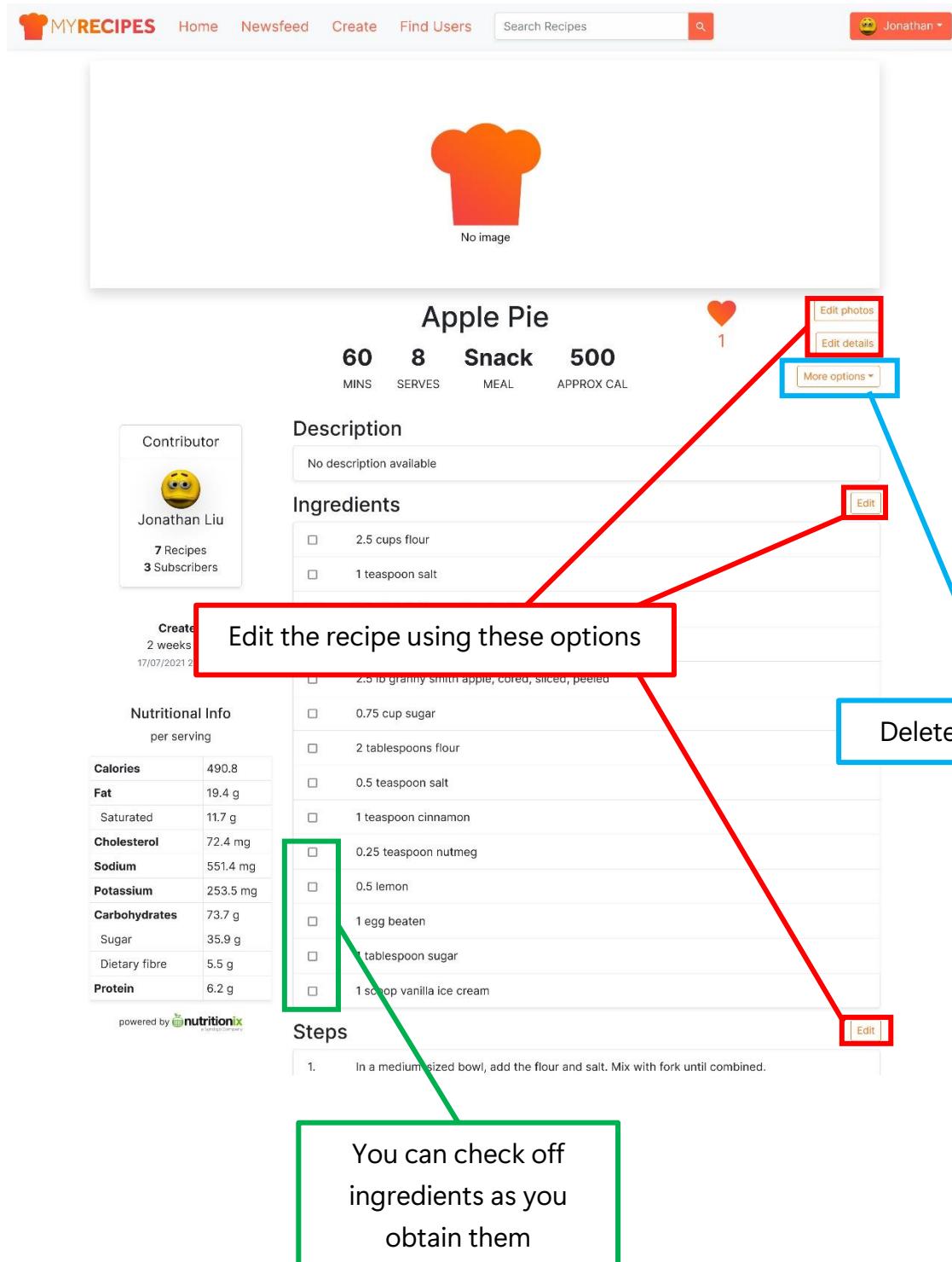
1	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	≡	x
2	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	≡	x
3	Quantity (if any) <input type="text"/>	Unit (if any) <input type="text"/>	Name <input type="text"/>	≡	x
					Add

Next: Directions

## 6.6 EDITING OR DELETING A RECIPE



1. Go to the recipe page of the recipe you want to edit or delete. You can find a list of your recipes in your profile, accessible here.



**Edit the recipe using these options**

**Delete a recipe here**

**You can check off ingredients as you obtain them**

**Contributor**  
Jonathan Liu  
7 Recipes  
3 Subscribers

**Description**  
No description available

**Ingredients**

- 2.5 cups flour
- 1 teaspoon salt
- 2.5 lb granny smith apple, cored, sliced, peeled
- 0.75 cup sugar
- 2 tablespoons flour
- 0.5 teaspoon salt
- 1 teaspoon cinnamon
- 0.25 teaspoon nutmeg
- 0.5 lemon
- 1 egg beaten
- 1 tablespoon sugar
- 1 scoop vanilla ice cream

**Steps**

1. In a medium sized bowl, add the flour and salt. Mix with fork until combined.

**Contributor**  
Jonathan Liu  
7 Recipes  
3 Subscribers

**Description**  
No description available

**Ingredients**

- 2.5 cups flour
- 1 teaspoon salt
- 2.5 lb granny smith apple, cored, sliced, peeled
- 0.75 cup sugar
- 2 tablespoons flour
- 0.5 teaspoon salt
- 1 teaspoon cinnamon
- 0.25 teaspoon nutmeg
- 0.5 lemon
- 1 egg beaten
- 1 tablespoon sugar
- 1 scoop vanilla ice cream

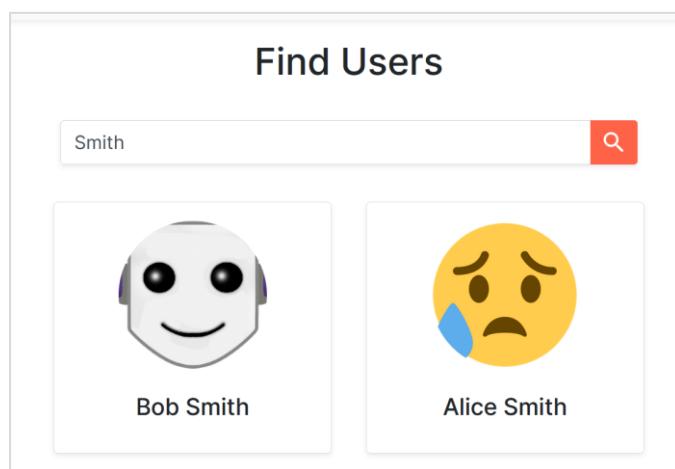
**Steps**

1. In a medium sized bowl, add the flour and salt. Mix with fork until combined.

## 6.7 SEARCHING FOR A USER



1. Select Find Users in the top bar.



The "Find Users" interface shows a search bar with "Smith" and a search button. Below it are two user profiles: Bob Smith (smiling face) and Alice Smith (crying face).

User	Profile Picture
Bob Smith	Smiling Face
Alice Smith	Crying Face

2. Search users by first name, last name, or both.

Select a user to view their profile.

## 6.8 USER PROFILE

*If this is your own profile*

You can access a list of your subscribers (people who have subscribed to you) and your subscriptions (people you subscribed to) by clicking the number.



Alice Smith

3

2

RECIPES SUBSCRIBERS

Unsubscribe

All Recipes (3)

Recipes You Liked (1)

Recipes They Liked (3)

Comments (7)

Filter

Meal type

- Breakfast
- Dinner
- Snack

Serving Size



Time to cook



Calories



Subscribe or unsubscribe from this user.

If you're subscribed, you will see their recent recipes in your newsfeed  
(See next section)

User profiles can be accessed using

1. 'Find Users',
2. by clicking the contributor in a recipe page
3. clicking 'My Profile'

Change tabs.

1. *All Recipes*: a list of recipes they created
2. *Recipes You Liked*: recipes they created that you liked
3. *Recipes They Liked*: recipes they liked
4. *Comments*: a list of their comments

## 6.9 NEWSFEED

The newsfeed displays the latest recipes from your subscriptions and also personalised recommendations.

Your Profile



Jonathan Liu

7 RECIPES    3 SUBSCRIBERS

[Hide Recommended](#)

Subscriptions

-  Alice Smith
-  Charlie Fitzgerald

A list of your subscriptions (users you've subscribed to)



Charlie Fitzgerald  
Created 2 weeks ago



BEST fried potatoes

45 MINS

Hide recommended recipes from your newsfeed. This will leave only recipes from your subscriptions.

Recommendations are calculated based on your search history.

Recommendations are distinguished with a **RECOMMENDED** tag.

15 MINS

4 SERVES

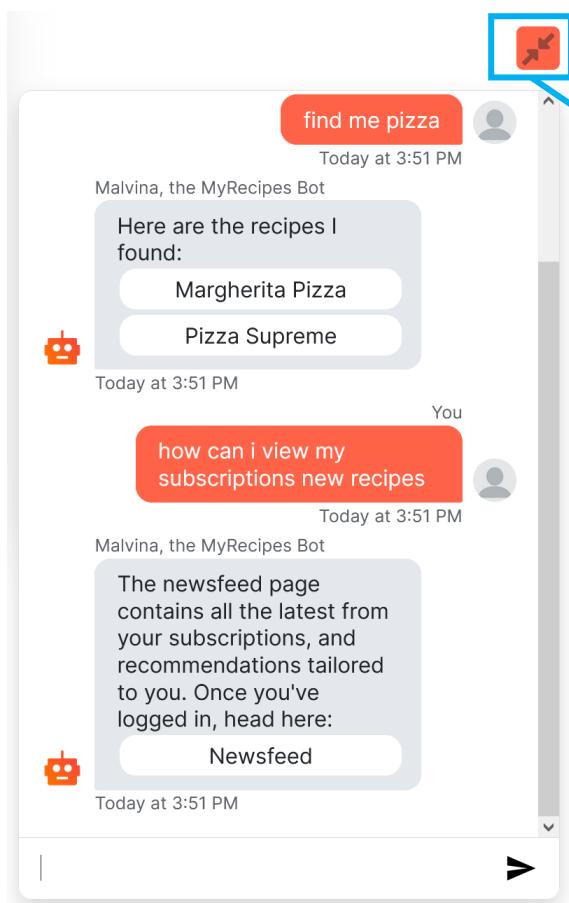
Dinner MEAL

600 CAL

0 RECOMMENDED

## 6.10 TALKING TO MALVINA, THE CHATBOT

The chat bot is accessible in the bottom right corner of any page with this icon.



find me pizza  
Today at 3:51 PM

Malvina, the MyRecipes Bot  
Here are the recipes I found:  
Margherita Pizza  
Pizza Supreme

Today at 3:51 PM

You  
how can i view my subscriptions new recipes  
Today at 3:51 PM

Malvina, the MyRecipes Bot  
The newsfeed page contains all the latest from your subscriptions, and recommendations tailored to you. Once you've logged in, head here:  
Newsfeed

Today at 3:51 PM

A blue box with a red border points to the top right corner of the screen, where the red speech bubble icon is located. A blue arrow points from this box to the icon. Another blue box with a red border is positioned to the right of the message list, containing the text "Click here to minimise the chatbot".

Simply type a question and press enter! Malvina can help you with many things.

To clear chat history, don't ask Malvina another question for 1 hour. The search history will be cleared 1 hour after your most recent message.

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