Final Redesign Rational:

1. We changed our colour scheme a bit so that it does not convey mixed signals. We utilized the feedback from our horizontal prototype evaluation, and used different colours to indicate different states of the system. For example, we kept yellow for medium difficulty level and changed the colour to white for the ingredient substitution box in the recipe profile page.
2. We moved the left sidebar with tabs for search, cookbook, current recipe and profile to the bottom of the screen for ease of accessibility since the form factor of our application is for a typical mobile device.
3. We redesigned some of the interactive widgets with the form factor in mind so that they are big enough to be interacted with touch. For example, the increment and decrement buttons for changing the serving size are separated and have larger surface areas compared to in the medium fidelity prototype. The size of the checkboxes were also increased to accommodate a smaller screen form factor and to prevent hits of unintended boxes.
4. In the step by step screen, we had a pull down screen that displayed the ingredient list in the horizontal prototype. We decided to remove this feature because it was a bit redundant in terms of the number of clicks the user has to perform to see the list, since there is a button readily available to take them back to the recipe profile page which contains the ingredient list. We decided not to include the measurement for each ingredient in the step itself because a step might require a lot of ingredients and the page would get cluttered with information that the user might not need. There was a clash of convenience versus clarity in making this decision. Clarity was preferred as it was one of the driving factors for a step-focused design. Furthermore, a user typically gathers the ingredients first according to the measurement provided in the list of ingredients.
5. We added a progress indicator simply stating which step out of the total number of steps that a user is on. For users following the step by step instructions for a recipe, this will make the user aware of how many steps are left and provide a good judgement of remaining time and effort.
6. We decided not to indicate an estimate of remaining time because each user has a different pace in the kitchen. For example, an inexperienced cook typically would take longer to cut a carrot compared to an expert user. We wanted to give them the freedom to perform tasks in their own convenient way, without pressure. Since our design is focused on being appropriate for multiple experience levels, we see little harm in allowing flexibility.

7. In the profile tab, we had a preferences tab where the user would be able to select their measurement preferences. We decided to remove this tab because in the recipe profile page, there is an ingredient checklist where the user will be able to modify their measurement preference there. We felt that it was redundant to choose a preference in the profile tab and giving them the ability to choose again in the recipe profile page.

Final Discussion of our System:

- **Parts of the design that work well:**

A driving factor in the system design was to never lose touch with early ambitions that were idealized to solve problems with the existing technology/methods. One such ambition was to create a highly customizable and flexible environment. Our system design provides many tools such as finding new recipes, saving favourites in a localized place, the ability to modify parts of a recipe, instructional/convenience tools (e.g. unit conversion, recipe scaling, terminology hints), etc. A user can feel comfortable knowing that our application acts as a helping aid at multiple stages of the process, rather than being obstructive. The application serves the purpose of acting as a personal customizable cookbook. It gives the user freedom to modify a found recipe and add their own flare to it.

Another aspect of focus was on providing simplified interaction during the cooking process. This was realized primarily in the step-focused progress, where the information for a single step is presented. Accompanied with a timer (if applicable to the step) and any terminology hints, a step page acts as a bookmark.

- **Parts that still needs improvement:**

We implemented the interface according to the form factor of a mobile device, but a few of our design elements do not coincide with typical mobile applications. For example, we did not design pop-up messages to behave as customary slide up/out menus. The present state of the system does not feature an onscreen keyboard, which would naturally be present in a mobile application requiring text-input. The interactions between screen and user are via buttons. This leaves a mechanical feeling to the interface and the addition of swiping functionality would help increase interaction flow.

The search system would benefit from refinement in terms of speeding up the process for more frequent users. Predictions or recommendations based on past usage could lead to a user discovering a new favourite recipe, which in turn would increase their desire to maintain using our application.

● **Design Strengths:**

The design has multiple strengths. Overall, the system features simple intuitive controls and pages that relate to each other in a cohesive manner. Most buttons have a consistent distinction from other presentational components such as labels, in terms of their 3D appearance. Many icons used are universal symbols that are also accompanied with clear messages describing their meaning/purpose. Interactions that cause significant changes (e.g. modifying a recipe) are accompanied with warning messages and undo capability. This ties into the overall error prevention heuristic. The constraints of a mobile form factor were considered and component sizes are proportionally larger.

● **Design Weaknesses:**

The design also has weaknesses that are important to note. First, system feedback is lacking in certain areas. One example is the favourite button does not display any message indicating that the press action had an effect. The only way to verify an effect, is to visit the favourites page. Another example is how timers for other steps do not display a status to the user on their current step. This is slightly compensated for by the notification feature when a timer has finished ticking down, but nevertheless remains a weakness. The system also has a lack of guiding instructions to aid a new user in gaining familiarity with the features.

● **Does the system work well for our identified users and tasks?**

Early on in the design process we described the purpose of our system as assisting people with learning, preparing and cooking a recipe. We considered three main user groups, beginners, frequent cooks and professional cooks. We did acknowledge early on that professional cooks may not see many benefits from using our system's tools, and would be appealed mostly by the social aspects of the application. At this stage, this system would not welcome this user class due to the lacking social features. On the other hand, the application provides many benefits to the other 2 user classes. A main goal was to improve upon the traditional mediums that these users would consult during the cooking process. Relative to cookbooks or internet sources, our interface provides a more compact and cohesive environment. Referring back to our original task examples, most of the behaviours could be transferred over as interactions with our system. The high priority requirements of our system have been implemented and any lower priority ones were filtered out due to our constraints.

Heuristic Evaluation:

Evaluator: Mehnaz

#	Design Heuristic	Problems Detected	Suggested Fix
1	Visibility of system status	i) After modifying a recipe, when the user presses the "Save" button, the user does not know if the save was successful or not	A notification/toast message of some sort to confirm that edit was successful could provide useful feedback for user action.
		ii) The heart button in recipe profile page, on clicking , the colour changes to red but it does indicate that the recipe is now saved under cookbook/favorite tab	A message that the recipe is saved/ or some other feedback would be useful.
		iii) If there are multiple steps where a user started timer, the user does not get feedback on the status of a timer from a different step	Could create a view in each Step by Step page where all the timers that are currently active are stacked in a scrollable bar.
		iv) On clicking "Forgot password?" link in sign in page, there is no feedback or action from the system, The user is not aware if the link is broken or this is a problem with the application	Have a placeholder action or some feedback to provide the user of system status.
2	Match between system and the real world	i) The button icon for editing a step in modify steps page is not very intuitive and user might not relate the meaning correctly	A label might help or using a more well known icon for editing.

		ii) The download button icon has the same issue, The user might not understand that the icon is supposed to download the recipe in an external file in the system	A label or help instruction can be helpful in this situation.
3	User control and freedom	i) The system does not allow the user to rate a recipe without signing up first, but there are no useful features for users with a profile other than being able to rate a recipe	Incorporate more useful features like being able to remotely access favourite recipes or modified recipe from cloud without using their personal device.
		ii) There is no option for user to jump to a step, with the current design. User have to go one step at a time to browse a particular step.	Have a option to jump to a page of choice by user.
4	Consistency and standards	i) There is a mixture of font size and types, for example compared to Recipe Profile page list of steps, the steps in step by step is different size and style	Have same Font family and style in all pages.
5	Error prevention	i) No spelling and grammar check in modify recipe feature	Incorporate a spelling checker for better user experience and future failure in searching the recipe.
		ii) There is no check for validity of email addresses in sign up page	Add a check to prevent invalid email being stored in the system.

6	Recognition rather than recall	i) Search page should display the current sort/filter if it was chosen from previous screen	Have each of the widgets remember and display current state.
		ii) When the user sees the list of recipes, there is no indication if the user already favorited it or already made it	Incorporate an indicator to inform the user that he/she already browsed this recipe (browsing in the context that user started the recipe and reached completion page in the past)
		iii) In the step by step page, for an instruction, if a user want to refer back to the ingredient list to figure how much in amount it was needed, the user will have click the back button to go to recipe profile page to find it out	Could have the amount in the instruction itself .
7	Flexibility and efficiency of use	i) In the search recipes page, user does not have the option to just press enter to get results , user has to press another button	Some of the interactions are rigid, having more than one way to interact or carry out a task can be beneficial.
8	Aesthetic and minimalist design	i) some pages are a bit cluttered such as the favourite tab under cookbook	White space can be utilized more.
9	Help users recognize, diagnose, and recover from errors	i) When the user types in a misspelled word in the search bar, there is no meaningful feedback	Incorporate a way to suggest possible alternative words to user.
10	Help and Documentation	i) When a user first lands on the home page for the first time, the user is not aware of a lot of feature	A short help/tutorial to highlight the features for first time users..

		like ability to edit, substitute an ingredient etc	

Evaluator: Aaron

#	Design Heuristic	Problems Detected	Suggested Fix
1	Visibility of system status	i) although the favourite button uses a universal symbol, a user might not know where the favourite is saved to.	The addition of an accompanying message that provides feedback that the recipe is saved/unsaved from the cookbook favourite page would help.
		ii) currently timers for previous steps tick down in the background and there is no maintained visibility to the user.	Displaying all timers on every step page would remind the user of an ongoing task. It would also help organize the status of concurrent timers.
2	Match between system and the real world		
3	User control and freedom	i) Although the recipe modification pages use warning messages to alert the user to a permanent action, the pages don't allow the ability to "reset all", other than cancelling and restarting the edit.	The addition of a button to reset the default state of the recipe would allow a more clear pathway to the user to make decisions.
4	Consistency and standards		
5	Error prevention		
6	Recognition rather than recall		
7	Flexibility and efficiency of use	i) search results aren't tailored for a specific user.	If the search system recommended recipes to a frequent user based on

#	Design Heuristic	Problems Detected	Suggested Fix
			their app usage, it would speed up their experience.
8	Aesthetic and minimalist design		
9	Help users recognize, diagnose, and recover from errors		
10	Help and Documentation		

Evaluator: Bryan

#	Design Heuristic	Problems Detected	Suggested Fix
1	Visibility of system status	When starting the timer, you probably don't want to wait for the timer to stop. You could be doing other things and a normal person would probably press next step. You do not get an indication of how far along the timer is	Make the timers follow you step by step.
2	Visibility of System status	Some texts are just too small to read. Especially if it's on a smaller mobile device. E.g. On the food profile page, that start error going to the completion page	Make them bigger
3	Visibility of System Status	For every page that is empty, there is some text telling you why it's empty and how to fill the page up (current recipe, personal page, recent page) but favorite page does not provide information when its empty	Provide some text when the page is empty

4	Visibility of System Status/Consistency and standards	For every page that is empty, there is some text telling you why it's empty and how to fill the page up (current recipe, personal page, recent page) but favorite page does not provide information when its empty	Provide some text when the page is empty
5.	Visibility of System Status	Changing ingredient substitution does not change the steps. Does not provide the appropriate feedback as it should	Make it so that the changes are reflected in the steps.
6	Match between system and the real world	n/a	n/a
7	User control and freedom	No undo buttons for when steps are deleted or changed or when a modify recipe is deleted	Include undo buttons for modifications of a recipe
8	Consistency and standards	The top tabs on the search page and the cookbook page are inconsistent. The search page top bars are smaller than the cookbook bars.	Make them the same size
9	Consistency and standards	Rename button is different from all the other buttons. It is of different color and its font is in italics.	Make the button similar to the others
10	Consistency and standards	Different font style in the sign up page? More bold	Make it consistent to the rest of the app
11	Consistency and standards	For whenever something is deleted, such as ingredient, or equipment in the modification page it gives you a warning pop	Provide warning popup

		up. It does not give you a poop up for trying to delete a modification recipe.	
12	Consistency and Standards	Red bars up and down usually signify scrollable area is seems. Such as in the recipe profile page or in the modification sub pages. But search only has 1 red bar on top.	Make a red underline for search
13	Error prevention		
14	Recognition rather than recall	n/a	n/a
15	Flexibility and efficiency of use	When deleting steps or equipment's, a warning popup always warns the user before hand. A novice user may want to delete a lot of things very fast without the warning pop up every time	Maybe add a checkbox in the popups saying "don't show me this in the future"
16	Flexibility and minimalistic design	No fast way to unfavorite a lot of things. Must go into the profile page and then unfavorite and then go out to unfavorite another	Have a way to unfavorite a lot of things. Maybe on the favorite list, have a toggle that allows you select multiple buttons and unfavorite them when you confirm
17	Aesthetic and minimalist design	Black text on pop window on step by step pages is hard to see on the dark red background. On other popups (such as those on the modification page, they use different texts)	Make text a different color that's easier to read

#			
18	Help users recognize, diagnose, and recover from errors	n/a	n/a
19	Help and Documentation	n/a	n/a

Evaluator: Cynthia

#	Design Heuristic	Problems Detected	Suggested Fix
1	Visibility of system status	When the user presses on the share icon, it opens the browser to Facebook without indicating the user. Users are unable to see the timer on one step if they go to another step.	Add a popup message to indicate that the app is opening and external browser for sharing. Allow the user to see the timer for each step that requires one.
2	Match between system and the real world	User may not know what the share 'S' icon may do. User may not know what the edit pencil icon may do User may not know what the download button may do.	Use a more universal share icon instead of a letter Adding a label 'edit' to the icon may help the user understand what the icon does. Adding a label 'download' to the icon may help the user user understand what the icon does.
3	User control and freedom	Users are unable to navigate to a specific step in a recipe.	Allow the user to be able to go directly to a specific step of their choosing.
4	Consistency and standards	For modifying a recipe, the back button and cancel button may be interpreted as the same thing.	Getting rid of the back button can help clear any misinterpretations.
5	Error prevention	Deleting a modified recipe does not give the user a	Provide the user with a confirmation message

#	Design Heuristic	Problems Detected	Suggested Fix
		warning before deletion.	may help the user from making a mistake.
6	Recognition rather than recall	From the search page, listing recipes, the user does not know which of the recipes are favorited.	Adding the favourites icon to each of the recipes to indicate whether or not it is in their favourite list.
7	Flexibility and efficiency of use	Need to type out whole name in search.	Add in auto complete for search.
8	Aesthetic and minimalist design	In Cookbook Favourites Tab, recipe tabs contain the edit icon, clicking on the recipe opens up the recipe profile page with another edit icon, which is redundant.	Remove one of the edit icons from one page.
9	Help users recognize, diagnose, and recover from errors	Users can search for recipes but can end up with no recipes, user may not know this because of the blank screen.	Indicate that no recipes has been found to the user.
10	Help and Documentation	First time users of the application may be overwhelmed.	Have a short tutorial to help the user understand how the app works and what each feature does.

Evaluator: Wesley

#	Design Heuristic	Problems Detected	Suggested Fix
1	Visibility of system status	The sliders used in the filter don't have beginning or end numbers. It may not be clear that a user must hit 'enter' on their keyboard to add an ingredient tag.	Change sliders to display the quantities that the slider ranges from. Add a 'add' button so that users can use that if they don't use enter instead.
2	Match between system and the real world	It may be difficult for users to understand that the	Provide indication of its functionality and redesign

		ascending vs descending sort is a clickable button and what its purpose is.	it in a way that makes it clear it is meant to be clicked, either with consistent button styles, or perceived affordances.
3	User control and freedom	There are many warning popups that appear, even if no changes were made. And no way to turn off these prompts. There's no way to change the way the filter filters. Currently, filter for difficulty is equality, and the rest are anything less than the specified amount.	Only show popups if unsaved changes have been made. Or allow users to not show the popup anymore. Supply an advanced option to change the filter from its defaults.
4	Consistency and standards	n/a	n/a
5	Error prevention	There is nothing preventing the user from entering incorrect food tags, making it quite hard to find what they want if they entered it wrong.	Provide a set list of tags from which the user can select from when entering a new tag.
6	Recognition rather than recall	A user may not know what exactly it was they inputted into the search terms. When editing a recipe, there's no way to compare it to the original, or tell if it has been changed.	Provide some interface for them to review their search without taking up too much space. Provide a 'snapshot' of the previous recipe, or highlight changes that have been made, or even just show changes have occured with an indicator.
7	Flexibility and efficiency of use	A user may want to refer to a previous search, but cannot after starting a new search.	Store past searches or frequently searched and retrieve it for the user for efficient searching.

8	Aesthetic and minimalist design	Some components of the design lack consistency.	Obtain a colour scheme and style for components, then apply consistently across the interface.
		There's a lot of whitespace in the search page.	Redesign or utilize space more effectively, possibly for more features.
9	Help users recognize, diagnose, and recover from errors	Users can search for recipes but can end up with no recipes, and may not know what part of their search resulted in no recipes.	Indicate possible fixes to the user, or describe what restriction resulted in no recipes.
10	Help and Documentation	There is no documentation.	Provide some documentation.

Summary of Heuristic Evaluation

Ratings :

0 = I don't agree that this is a usability problem at all
1 = Cosmetic problem only: need not be fixed unless extra time is available on project
2 = Minor usability problem: fixing this should be given low priority
3 = Major usability problem: important to fix, so should be given high priority
4 = Usability catastrophe: imperative to fix this before product can be released

#	Design Heuristic	Problems Detected	Severity Rating	Suggested Fix
1	Visibility of system status	i) After modifying a recipe, when the user presses the "Save" button, the user does not know if the save was successful or not	2	A notification/toast message of some sort to confirm that edit was successful could provide useful feedback for user action.

		ii) The heart button in recipe profile page, on clicking, the colour changes to red but it does not indicate that the recipe is now saved under cookbook/favorite tab	2	A message that the recipe is saved/ or some other feedback would be useful.
		iii) If there are multiple steps where a user started timer, the user does not get feedback on the status of a timer from a different step	4	Could create a view in each Step by Step page where all the timers that are currently active are stacked in a scrollable bar.
		iv) On clicking "Forgot password?" link in sign in page, there is no feedback or action from the system, The user is not aware if the link is broken or this is a problem with the application	4	Have a placeholder action or some feedback to provide the user of system status.
		v) When the user presses on the share icon, it opens the browser to Facebook without indicating the user.	2	Add a popup message to indicate that the app is opening and external browser for sharing.
		vi) Some texts are just too small to read. Especially if it's on a smaller mobile device. E.g. On the food profile page, that start error going to the completion page	1	Make them bigger
		vii) For every page that is empty, there is some text telling you why it's empty and how to fill the page up (current recipe, personal page, recent page) but	1	Provide some text when the page is empty (is fixed)

		favorite page does not provide information when its empty		
		viii) Changing ingredient substitution does not change the steps. Does not provide the appropriate feedback as it should	3	Make it so that the changes are reflected in the steps.
		ix) although the favourite button uses a universal symbol, a user might not know where the favourite is saved to.	2	The addition of an accompanying message that provides feedback that the recipe is saved/unsaved from the cookbook favourite page would help.
2	Match between system and the real world	i) The button icon for editing a step in modify steps page is not very intuitive and user might not relate the meaning correctly	2	A label might help or using a more well known icon for editing.
		ii) The download button icon has the same issue, The user might not understand that the icon is supposed to download the recipe in an external file in the system	1	A label or help instruction can be helpful in this situation.
		iii) User may not know what the share 'S' icon may do.	2	Use a more universal share icon instead of a letter.
		iv) User may not know what the edit pencil icon may do	2	Adding a label 'edit' to the icon may help the user understand what the icon does.

3	User control and freedom	i) The system does not allow the user to rate a recipe without signing up first, but there are no useful feature for users with a profile other than being able to rate a recipe	3	Incorporate more useful features like being able to remotely access favourite recipes or modified recipe from cloud without using their personal device.
		ii) There is no option for user to jump to a step, with the current design. Users have to go one step at a time to browse a particular step	2	Have a option to jump to a page of choice by user.
		iii) No undo buttons for when steps are deleted or changed or when a modify recipe is deleted	3	Include undo buttons for modifications of a recipe
		iv) Although the recipe modification pages use warning messages to alert the user to a permanent action, the pages don't allow the ability to "reset all", other than cancelling and restarting the edit.	3	The addition of a button to reset the default state of the recipe would allow a more clear pathway to the user to make decisions.
4	Consistency and standards	i) There is a mixture of font size and types, for example compared to Recipe Profile page list of steps, the steps in step by step is different size and style	1	Have same Font family and style in all pages.
		ii) For modifying a recipe, the back button and cancel button may be interpreted as the same thing.	2	Getting rid of the back button can help clear any misinterpretations

		iii) The top tabs on the search page and the cookbook page are inconsistent. The search page top bars are smaller than the cookbook bars.	1	Make them same size
		iv) Rename button in modification page is different from all the other buttons. It is of different color and its font is in italics.	1	Make the button similar to the others
		v) For whenever something is deleted, such as ingredient, or equipment in the modification page it gives you a warning pop up. It does not give you a pop up for trying to delete a modification recipe.	3	Provide warning popup
		vi) Red bars up and down usually signify scrollable area is seems. Such as in the recipe profile page or in the modification sub pages. But search only has 1 red bar on top.	1	Make a red underline for search
5	Error prevention	i) No spelling and grammar check in modify recipe feature	2	Incorporate a spelling checker for better user experience and future failure in searching the recipe.
		ii) There is no check for validity of email addresses in sign up page	3	Add a check to prevent invalid email being stored in the system.
		iii) Deleting a modified	3	Provide the user

		recipe does not give the user a warning before deletion.		with a confirmation message may help the user from making a mistake.
6	Recognition rather than recall	i) Search page should display the current sort/filter if it was chosen from previous screen	3	Have each of the widgets remember and display current state.
		ii) When the user sees the list of recipes, there is no indication if the user already favorited it or already made it	2	Incorporate an indicator to inform the user that he/she already browsed this recipe (browsing in the context that user started the recipe and reached completion page in the past)
		iii) In the step by step page, for an instruction, if a user want to refer back to the ingredient list to figure how much in amount it was needed, the user will have click the back button to go to recipe profile page to find it out	2	Could have the amount in the instruction itself .
		iv) From the search page, listing recipes, the user does not know which of the recipes are favorited.	3	Adding the favourites icon to each of the recipes to indicate whether or not it is in their favourite list.
7	Flexibility and efficiency of use	ii) In the search recipes page, user does not have the option to just press enter to get results, user has to press another button	0	Some of the interactions are rigid, having more than one way to interact or carry out a task can be beneficial

		iii) Need to type out whole name in search.	2	Add in auto complete for search.
		iv) When deleting steps or equipment's, a warning popup always warns the user before hand. A novice user may want to delete a lot of things very fast without the warning pop up every time	2	Maybe add a checkbox in the popups saying "don't show me this in the future"
		No fast way to unfavorite a lot of things. Must go into the profile page and then unfavorite and then go out to unfavorite another	2	Have a way to unfavorite a lot of things. Maybe on the favorite list, have a toggle that allows you select multiple buttons and unfavorite them when you confirm
		i) search results aren't tailored for a specific user.	2	If the search system recommended recipes to a frequent user based on their app usage, it would speed up their experience.
8	Aesthetic and minimalist design	i) some pages are a bit cluttered such as the favourite tab under cookbook	1	White space can be utilized more.
		ii) In Cookbook Favourites Tab, recipe tabs contain the edit icon, clicking on the recipe opens up the recipe profile page with another edit icon, which is	2	Remove one of the edit icons from one page.

		redundant.		
		iii) Black text on pop window on step by step pages is hard to see on the dark red background. On other popups (such as those on the modification page, they use different texts)	1	Make text a different color that's easier to read
9	Help users recognize, diagnose, and recover from errors	i) When the user types in a misspelled word in the search bar, there is no meaningful feedback	2	Incorporate a way to suggest possible alternative words to user.
		ii) Users can search for recipes but can end up with no recipes, and may not know what part of their search resulted in no recipes.	3	Indicate possible fixes to the user, or describe what restriction resulted in no recipes.
10	Help and Documentation	i) When a user first lands on the home page for the first time, the user is not aware of a lot of feature like ability to edit, substitute an ingredient etc	2	A short help/tutorial to highlight the features for first time users..

Summary:

The most severe heuristic violations found were:

- If there are multiple steps where a user started timer, the user does not get feedback on the status of a timer from a different step. (Visibility of system status)
- On clicking "Forgot password?" link in sign in page, there is no feedback or action from the system, The user is not aware if the link is broken or this is a problem with the application. (Visibility of system status)

The heuristic with the most identified violations was "Visibility of system status", however some of them are minor aesthetic issues or areas where additional feedback to the user would be helpful, regardless if some feedback is already provided.

For "Match between system and the real world", there are a few icons that are not intuitive and could be changed into more universal ones.

The "User control and freedom" heuristic violations were due to specific interactions that could provide more freedom to the user.
The "Consistency and standards" heuristic was comparatively well satisfied throughout the application.