Capstone Stage 1

Design and Plan

Part of the Udacity Google Android Nanodegree programme
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The Kitchen Menu

Description

The Kitchen Menu is a productivity app that automates much, if not all of your grocery shopping by creating and managing your shopping lists.

The Kitchen Menus core design objective is to help you play your part in reducing your food waste. To understand why this is such an important issue please read the following articles from the Guardian:

[Americans waste 150,000 tons of food each day – equal to a pound per person](#)
[UK throwing away £13bn of food each year, latest figures show](#)

Main benefits:

- Saves you money
- Saves you time
- Considerably reduces food waste - it literally Saves Food from the dumpster!
- Significantly reduces repeated trips to the shop to get forgotten ingredients

Intended User

To be used by the person or persons in a household who purchase grocery shopping.

Secondary users who are not intended at this stage but could equally benefit include commercial or charitable institutions.

Features

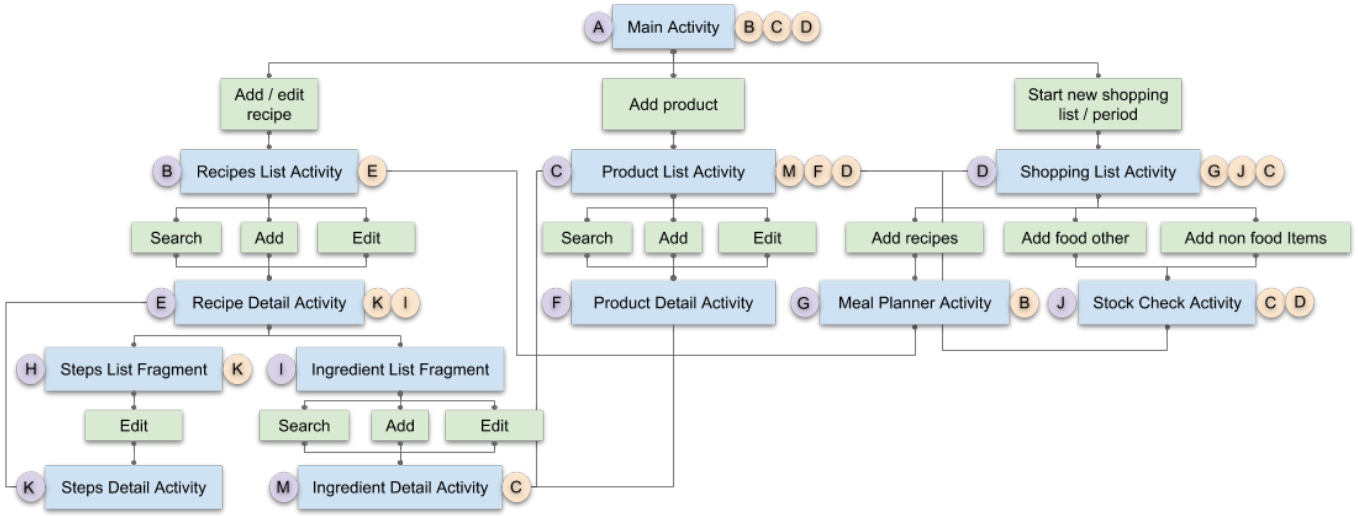
Key features:

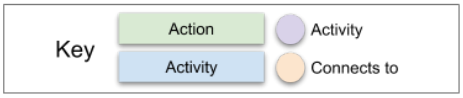
- Works out exactly what you need, no more, no less
- Tells you what you need to buy, where from and when
- Stores your family's favorite recipes
- Includes Meal planner

User Interface Mocks

The following UI mockups are for demonstration purposes only. The layout and theme will change during the development of the application as per the Material Design specifications.

Capstone Stage 1 - A Visual Aid to the Relationships Between Activities

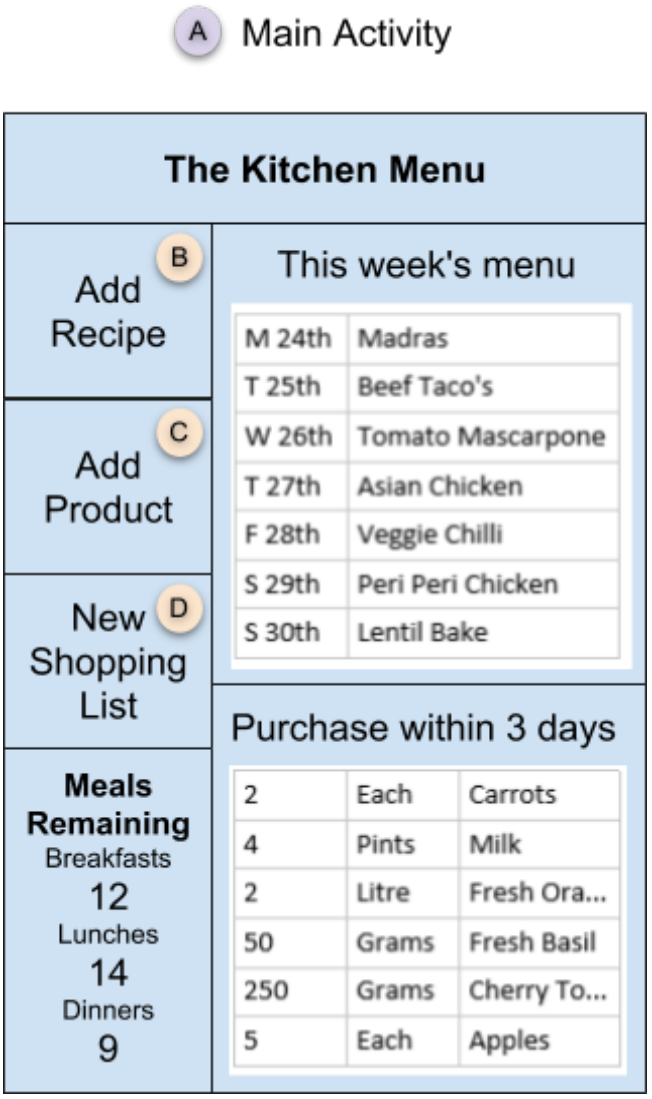




Course: Udacity Android Developer NanoDegree
Student: Peter Wanden - peter.wanden@gmail.com
Project: Capstone Stage 1: Application Design

Main Activity

This screen is the entry point for the application.



Main Activity Views:

- ‘This week’s menu’ - is a recycler view populated with data from the database.
- ‘Purchase within 3 days’ - is a recycler view populated with data from the database.
- ‘Add Recipe’ - Takes you to the Recipes List Activity.
- ‘Add Product’ - Takes you to the Product List Activity.
- ‘New Shopping List’ - Takes you to the Shopping List Activity.
- ‘Meal Remaining’ - Displays calculated information from the database

Landscape and tablet view of this activity will be a minor modification that will display ‘This week’s menu’ and ‘Purchase within 3 days’ plus possibly one or more lists side by side giving the user a much better overview of what is to come.

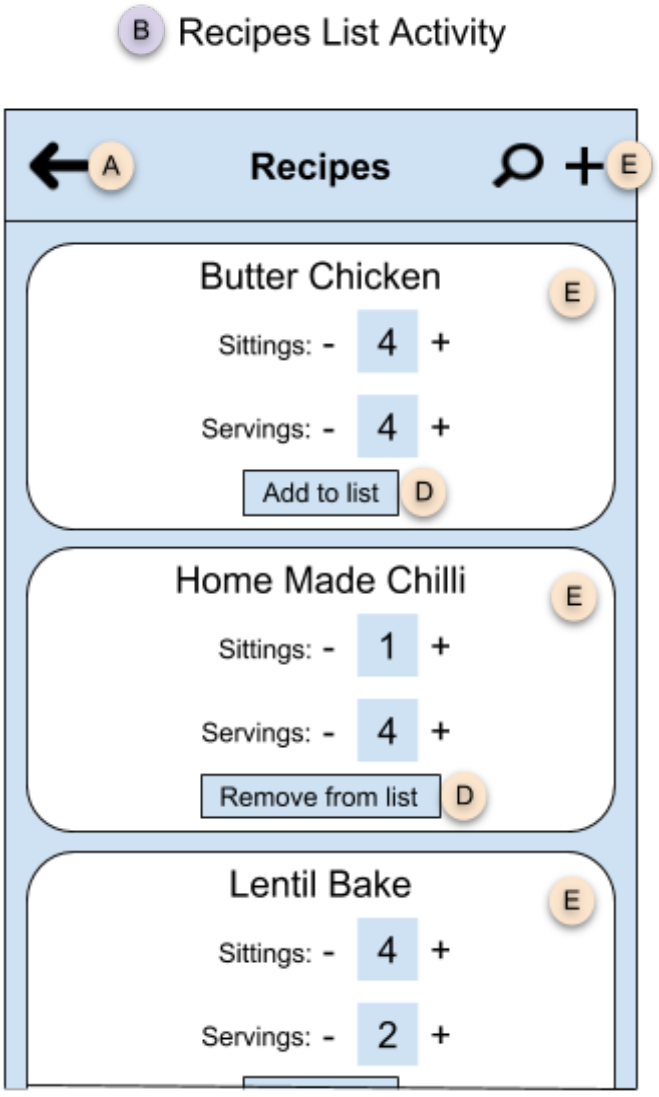
Corner and Edge Cases:

- If ‘This week’s menu’ is empty the ‘empty text’ will display ‘To add items to this week’s menu start a new shopping list’
- The ‘Purchase within 3 days’ data is derived from the same result set as ‘This week’s menu’, therefore if one is empty, so is the other.
- No internet connection - see the database section

Recipes List Activity

Displays a list of all recipes in the database. From here users can:

- Search for recipes
- Add new recipes to a shopping list
- Edit existing recipes
- Adjust the values for the number of servings and sittings of a recipe



Recipes List Views:

The toolbar - comprises of an up button, a title, search bar and a '+' button. The up button takes you to the activity from which it came which could be either the Main Activity, Recipe Detail Activity or the Meal Planner Activity. The '+' button will take you to a blank Recipe Detail Activity so that a new recipe can be added.

The main screen is made up of a recyclerview cardview. Each card will be formatted as per the Material Design Guidelines. Clicking on a card will take you to Recipe Detail Activity so that the selected recipe can be edited. Cards will also contain '+' and '-' buttons for altering the sittings and servings values of a recipe.

A further toggle button allows the user to add or remove a recipe from the current shopping list. This button is only visible if this activity is launched from the Meal Planner Activity. Once selected the user is directed back to the Meal Planner Activity.

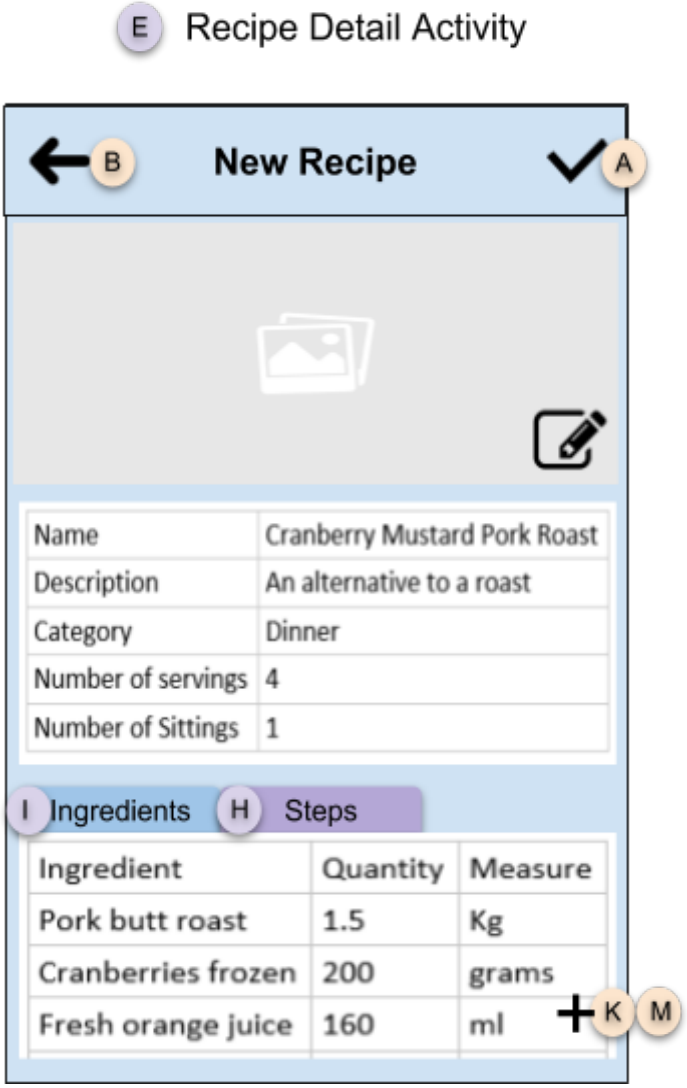
Landscape and tablet view will consist of a gridview of recipe cards.

Corner and Edge Cases:

- If there are no recipes in the database the 'empty screen' will display 'Press the '+' button to add your recipes.
- The minimum sittings and servings value is 1, the default is 1. The maximum for both values is 10.
- The default value for 'Add to list' is 'Add to list'.

Recipe Detail Activity

Allows users to add / edit original recipes.



Recipe Detail Views:

The toolbar comprises of an up button, title and tick. The up button navigates to Recipes List Activity. The title remains the same. The tick saves the new recipe to the database and navigates to the Recipes List Activity.

Picture view - This is where the user can upload or take a picture

Recipe overview - A simple editable overview of the recipe.

Ingredients List Fragment

A tabbed fragment that displays a list of ingredients. Selecting an ingredient takes the user to the Ingredient Detail Activity where they can edit or delete the ingredient. The '+' button allows the user to add a new ingredient by launching the Product List Activity.

Steps List Fragment

A tabbed fragment that displays a list of steps that allows for the viewing and reordering of steps to complete the recipe. Selecting a step takes the user to the Steps Detail Activity where they can modify or delete the selected step. Long pressing a step allows the user to reorder the step to a new location in the list. Selecting the '+' button takes the user to the Steps Detail Activity where they can add a new step.

Animations: A collapsing scrollview will be used so that either the steps or ingredients can be expanded upwards to fill the screen.

Landscape and Tablet view - If either the Ingredients or Steps tab is selected the respective list fragment and its detail activity will follow the Master Detail Flow, with the list to the left and the details to the right.

Corner and Edge Cases

Picture view - Pictures are to be stored in FireStore and downloaded using Picasso or Glide. If camera / storage permissions are granted an intent to the camera will allow a picture to be taken or a picture from the users library will be accessible. If camera permissions are denied this view will be set to 'gone'.

Recipe overview - Name will be restricted to 120 alphanumeric characters. Overflow will use ellipsis.

Recipe Steps Fragment

This is a fragment that populates a recyclerview of ingredients that are selected from the product table in the database, accessed through the Product List Activity. In the event ingredients are not entered the recipe overview information will be saved, however the recipe 'Add to list' button in the recipes list activity will be greyed out.

Recipe steps are not required in any part of the processing of the shopping lists, as such steps are not required to be entered. If a recipe has no steps entered the 'empty screen' message will read 'To add steps select the '+' button.

Ingredient Detail Activity

An overridden Product Detail Activity that allows the user to either change the quantity, retailer, whether you freeze the product as part of the recipe or delete the ingredient.

Ingredient Detail Views:

The toolbar - contains an up button, title, delete button and tick. The up button navigates to the previous activity which could be either the Ingredients List Fragment, The Product Detail Activity or the Product List Activity. The title stays the same. The delete button removes the ingredient from the recipe and returns to the previous activity. The tick saves the changes and navigates to the previous activity.

Picture view - Pictures are to be stored in FireStore and downloaded using Picasso or Glide. If camera / storage permissions are granted an intent to the camera will allow a picture to be taken or a picture from the users library will be accessible. If camera permissions are denied this view will be set to ‘gone’.

Ingredient product view - This is where the user can change the quantity, retailer and product freeze attributes.

The ‘+’ view This functionality allows the user to replace this product with another.

Corner and Edge Cases

If quantity is set to less than 0 the change will be rejected and a toast displaying the issue will be show.
See Recipe Detail Activity, Edge and Corner Cases, Picture View for more information.

Steps Detail Activity

This is where the user can add and modify recipe steps

Steps Detail Views

The toolbar consists of an up button, title and tick. The up button navigates to the previous activity which will be the Steps List Fragment. The title doesn't change, the tick saves any changes and navigates to the previous activity.

The main view consists of the step edit pane and the step title. The step edit pane is an edittext with a large amount of characters allowed. There are no restrictions placed on what the user can enter here (aside from a char limit of 500).

Corner and Edge Cases

No special characters.

Product List Activity

Displays a list of products the user can either search, add or edit.

C Product List Activity

Product List Views

The toolbar consists of up, title, search and '+' buttons. The up button returns the user to the previous activity which can be either the Ingredient Detail Activity, the Product Detail Activity the Shopping List Activity or the Stock Check Activity. The title stays the same, the search button opens a search bar within the title bar and allows the user to search for products. The '+' button navigates to the Product Detail Activity.

Landscape and tablet mode will show a Master Detail Flow arrangement with this activity as the master and the Product Detail Activity as the detail.

Corner and Edge Cases

None.

Product Detail Activity

Allows the user to search, add or edit product details

Product Detail Views

The toolbar consists of an up button, title, search bar and '+' symbol. The up button returns the user to the previous activity which can be either the Product List Activity or the Ingredient Detail Activity. The title stays the same. The search bar allows the user to search for a product. The '+' button allows the user to add a new product.

The picture view allows the user to add a picture

The product detail list allows the user to enter information about the product.

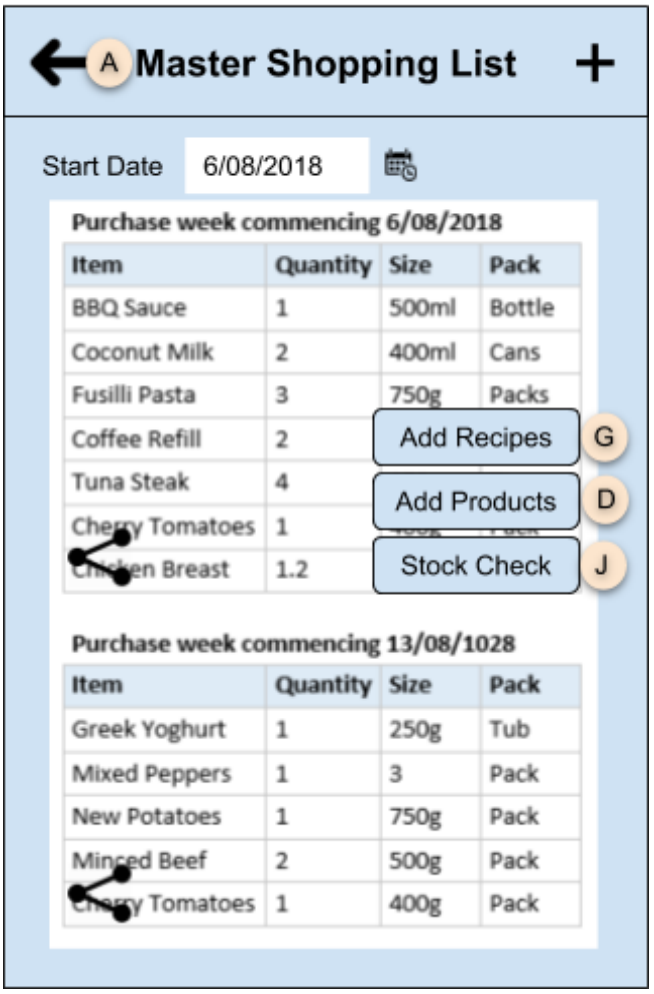
Edge and Corner Cases

- See Recipe Detail Activity, Edge and Corner Cases, Picture View for more information.
- Description - limited to x characters
- Retailer - limited to x chars, pull down with ability to add more
- Shelf life - fixed value pull down
- Pack size, number between 1 and 1000
- Unit of measure - fixed value pull down
- Storage room - limited to x chars, pull down ability to add more
- Storage location - limited to x chars, pull down ability to add more
- 1ml = ng - Used for converting volume to weight, i.e. Curry powder is sold by the gram and is specified in recipes by the teaspoon. If we need 5 teaspoons of curry powder for a recipe how many grams do we need to buy? 1ml (1cm3) of curry powder = 0.4261 grams and a teaspoon = 5ml. 3 teaspoons = 15ml x 1ml curry powder =0.4621 = 6.4 grams.
- Category - fixed value pulldown
- Freeze - boolean (overridden by some recipe ingredients, in for example dump cooking)
- Packs per shop - only shown for non recipe ingredients
- Unit price - will require local currency
- Amortise - only available for non recipe and recipe overridden products

Shopping List Activity

Allows the user to create new shopping lists, share a shopping list and pick a start date.

D Shopping List Activity



Product Detail Views

The toolbar consists of an up button, a title and a '+' button. The up button returns the user to the previous activity which could be either the Main Activity. The title doesn't change. The '+' button clears down the screen and allows the user to enter a new start date for a new shopping list.

Start Date opens a calendar app or produces a calendar view of the current month so the user can pick a start date.

Primary shopping list. This is a RecyclerView whose list can be shared by intent to another application.

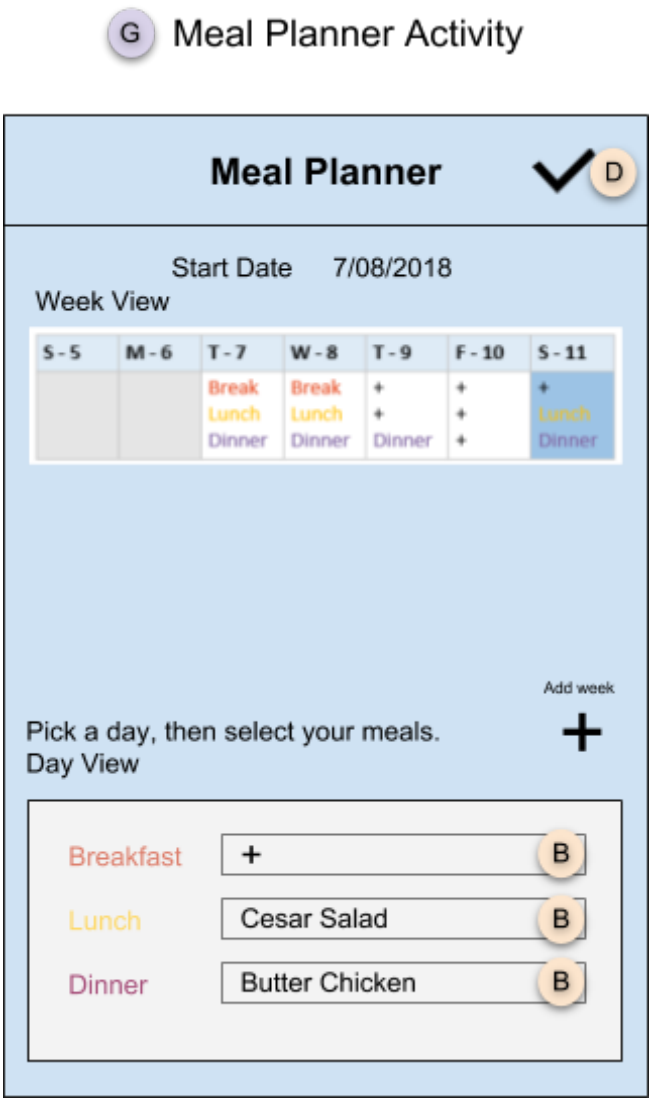
Additional shopping lists are automatically created and added. See Adding Products to the Stock Checklist / Shopping List for more information.
A Shopping List Helper class collects, extracts, converts and consolidates ingredients from recipes saved by the Meal Planner Activity and produces the shopping lists for this Activity.

Edge and Corner Cases

None for this view.

Meal Planner Activity

This activity allows the user to schedule specific meals a week at a time.



Meal Planner Views

The toolbar consists of the title and a tick. The title doesn't change. The tick saves the meals that have been selected and returns to the Shopping List Activity.

The start date is passed from the previous activity.
Week View - The meal planners diary is a single list item view (or fragment) containing seven child views, one for each day of the week. Selecting a day allows the user to update the meals for the Day View. Pressing the plus button adds another week list item view.

Day View - is limited to three meals for now. Selecting a meal option opens Recipes List Activity where a recipe can be selected.

Edge and Corner Cases

Up to four weeks can be added for a single shopping period.

Stock Check Activity

This activity displays an amalgamated list of products ordered by their location within the user's home. It allows the user to physically go to each location, delete or adjust quantities of any products that they already have in stock or add any that have been omitted.

J Stock Check Activity

Stock Check Activity Views

The toolbar consists of the title, a tick and a '+' button. The title never changes. The tick saves any updates to the shopping list and exits to the Shopping List Activity. The '+' button takes the user to the Product List Activity so that they may add a product.

The stock check listview is a scrollable recyclerview.

The listview rows allow you to increase and decrease the volumes of each item as well as delete each item as required.

Edge and Corner Cases

Any ingredients value must not be 0. If it is a toast will show requesting the value be increased or the item deleted.

Widget Activity

Shows the user what's for dinner during the current week.

Key Considerations

Data persistence

The application will have a local copy of the database. However common data, such as the product table will be shared as documents in Firebase.

Relational Database Schema

Product Database Schema
The data in this schema describes every use case for each product and recipe type

Product Table - Contains all common product information

_ID	Description	Retailer	UoM	Pack Size	Shelf Life	Location Room	Location in Room	Category	Pack Price
1	Milk	Waitrose	ml	2272	2	Kitchen	Fridge	Food-Other	1.00
2	Cinnamon	Waitrose	Grams	35	10	Kitchen	Spice Rack	Recipe	1.99
3	Shampoo	Tesco	ml	500	Bottle	Bathroom	Cupboard	Non Food	4.95
4	Chicken	Butcher	Grams	1	2	Kitchen	Fridge	Recipe	0.758

Food Other Table - Unique Information

_ID	_ID (Product)	Freeze	Required Quantity	Amortise
1	1	No	31808	Yes

Recipe Steps Table

_ID	Recipe ID	Step No	Description
1	1	1	Turn the oven on

Recipe Table - Contains all common Recipe Information

_ID	Recipe Title	Description	Category	Servings	Sittings
1	Cranberry Roast	Roast	Dinner	2	4

Non Food Table - Unique Information

_ID	_ID (Product)	Required Quantity
1	3	3

Shelf Life Table

_ID	Description	Value
1	2 Days	2
2	4 Days	4
3	1 Week	7
4	2 Weeks	14
5	3 Weeks	21
6	1 Month	30
7	Frozen	90
8	Dried	365
9	Tin	365
10	Jar	365
11	Bottle	365
13	Packet	365

Ingredients Table - Contains recipe specific product information

_ID	Product ID	Recipe ID	1ml = ng	Quantity Per Serving	Freeze
1	2	1	0.5275	0.3296875	No
2	4	1	0	187.5	Yes

Shopping List Index Table - Stores the 'From' and 'To' dates for each list created

_ID	From Date	To Date
1	01/01/2018	31/01/2018

Meal Planner Dates Table - Stores the dates allocated to specific meals

_ID	List Index ID	Recipe ID	Consumption Date	BLD
1	1	1	10/07/2018	L
2	1	2	10/07/2018	D

Shopping List Product Table - Stores the ID, quantity to purchase individual products purchased for each list

_ID	List Index ID	Product ID	Recipe ID	Quantity	Epd	Sd	Stock Checked	Purchased
1	1	1	null	6	06/07/2018	06/07/2018	No	No
2	1	1	null	6	09/07/2018	09/07/2018	No	No
3	1	2	1	2.6375	06/07/2107	15/07/2018	No	No

Edge and Corner Cases in the UX

Please see User Interface Mocks section above for individual cases for each screen.

Libraries

- Firebase database

- Firebase Auth
- Firebase UI Auth
- Firebase Messaging
- Firebase Storage
- Firebase Config
- Either Picasso or Glide for image loading.
- RecyclerView - for lists
- CardView for carding recipes
- Support libraries for backwards compatibility
- Constraint layout for some activities
- Okhttp for external connections
- Espresso for testing
- Databinding / Butterknife for binding views

Plugins
- Google services

Google Play Services for Auth and Firebase for common data
- Firebase for:
    - Authentication
    - Authorisation
    - Storage and synchronization
    - Storage for user uploaded content, such as photos, audio and video
    - Analytics
    - And if time notifications
    - Remote configurations for testing updates

Next Steps: Required Tasks

Task 1: Project Setup
- Create a new project called ‘The Kitchen Menu’
- Set the min SDK version to Lollipop, target to 28
- Add library dependencies
- Setup Gradle to find common library versions and sotre them elsewhere for easy version updating.
- Create POJO’s and complex data objects
- Create test data
- Create database and insert test data
- Create Firebase database and insert test data
- Implement Google services login

Task 2: Implement UI for Each Activity and Fragment
Implement the UI components that capture and store data in an order that ensures the datas referential integrity.
- Build UI and fragments for Main Activity
- Build UI for Recipes list Activity
- Build UI and fragments for Recipe Detail Activity
- Build UI for Ingredient Detail Activity
- Build UI for Steps Detail Activity

- Build UI for Product List Activity
- Build UI for Product Detail Activity
- Build UI for Shopping List Activity
- Build UI and Fragments for Meal Planner Activity
- Build UI for Stock Check Activity

Task 3: Implement application rules

- Create a Java library in the project root that contains the list, adding and sorting rules.
- Implement the rules
- Test the rules against the test data

Task 4: Connect Data Objects to to the UI

- Connect data objects to the UI in the same order as described in task 2
- Create Espresso test cases for complex UI objects as you go
- Once Task 2 and 4 are completed, test the algorithms in Task 3 against newly inputted data from the UI

Task 5: Implement Animations

- Implement UI animations as described in this document
- Use as much XML as possible to enable reuse

Task 6: Implement Widget

- Implement Widget
