

## Abstract

Applications for phones has formed what is now a massive and valid field for exposure for companies, expansion of a consumers' needs, and convenience for quick and easy access to multiple things including gaming, ordering stuff, maps, among others. Phones are now at the point where they are more a need, then a convenience, and as such the applications that are found within them are now staples of life. The goal for this project is to make an application for phones in which you can view food and place it into a shopping cart, a food ordering app. We'll make the app using Android Studio and the programming language of Kotlin, as well as using Firebase as a database to contain the products. At the end we would have a fluid app with visual for food, prices, and a working shopping cart named Minyx's Dinner.

## Introduction

This project originated from my fascination of how apps in phones work. We use apps daily for multiple things, but the workings behind them are a mystery to most people. Not only that, but often apps can crash or not work as fluidly as expected. Thus, my project idea, making something that could be used by anyone and has plenty of use. I wanted to make an app that would work with a database to hold the products and allow them to be easily modified from the database and have that affect the app. While the app would show the user the menu in a visually appealing way and allow the user to select stuff for the shopping cart.

## Background

Software Engineering is a huge field. In theory, it is a specialization on just software, but what one must realize is that software in the present day is made for many objects including phones, tablets, computers, to any number of hardware that requires software. I had to find something specific for my final project, and I saw the situation in our present day and decided apps in phones and tablets would be ideal. This since Covid-19 made these years hard for standard jobs and made most things work online now, including jobs, and more specifically for me, ordering food online. There are around 5 million apps at the start of 2022. This is a massive number, and one that shows the potential of the app market. Apps not only help consumers with taking care of their stuff, but also helps the producers behind the apps. Apps allow companies to show off their produce, it works as free advertisement while also helping the consumer. Apps have a whole e-commerce system behind them so it's a field that can't be underestimated. Understanding all this I opted to learn more about the process behind the makings of an app. As such I ended up making a food ordering app and in spirit of the project made it for an "official" dinner so I could do an app as official as possible.

## Problem

The problem is in making the app. Apps aren't simple, some use just the app to work, but many require a database, or attachments to make them work correctly using external factors. The problem for this app was where to designs it and what programming language, how to make it work with a database, and making the app have a menu and shopping cart that worked smoothly.

## Methodology

To create an application, we must first develop diagrams to give an idea of how the program would work. The simplest diagram I made was of a Use Case Diagram to show how the user would interact with the app, and how the app would use the database attached to it.

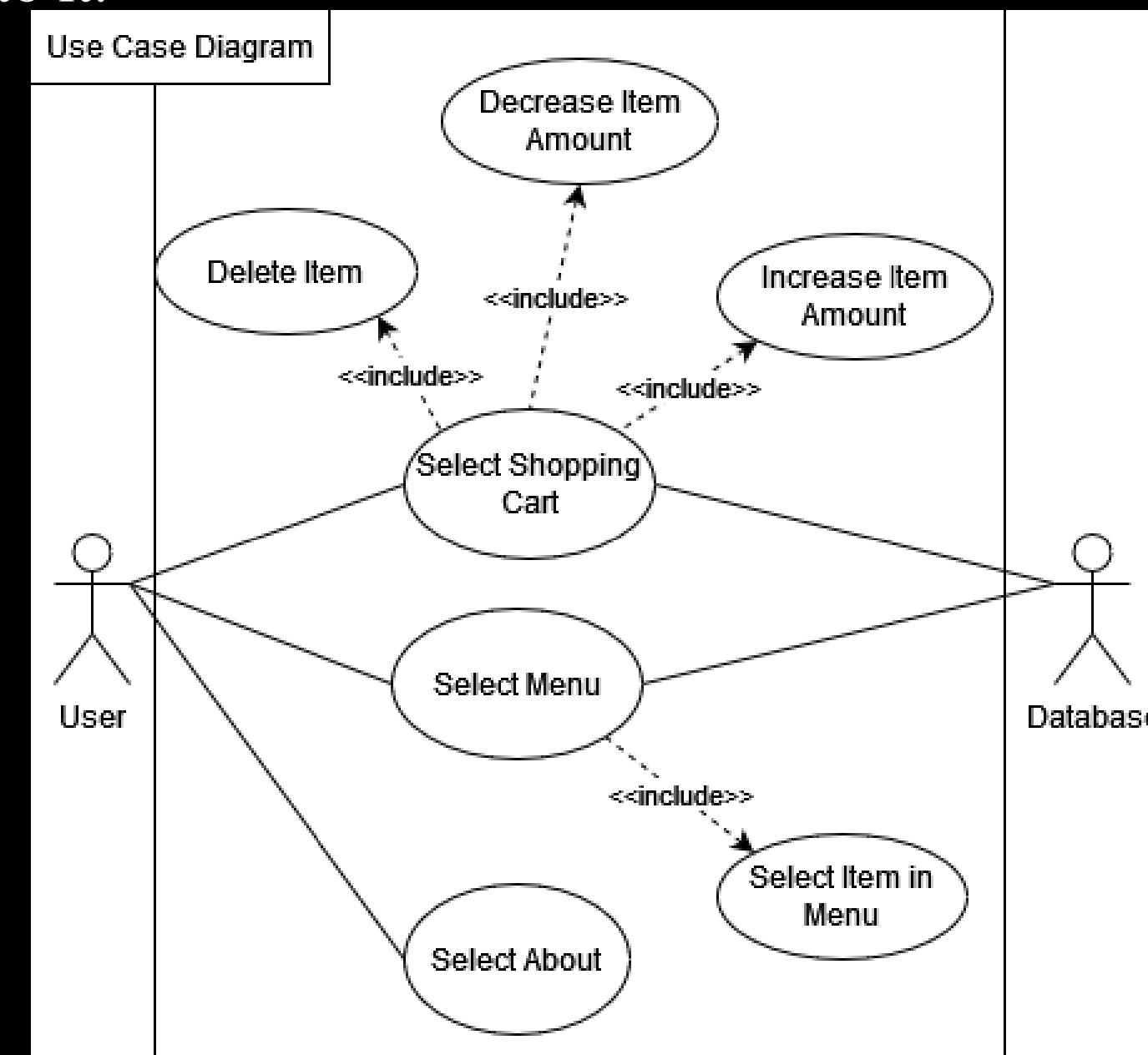


Figure 1: Use Case Diagram for the application of Minyx's Dinner. It shows how a user will interact with the three screens present in the app. It also shows how the database will provide the information for two of those screens.

After making this Use Case Diagram we have a better idea of what we want. As simple as it is, it is a good way to establish what is desired. Following that I must research how to make it come true. Designing apps can be done in multiple platforms, ultimately, I decided to work using Android Studio since I would make my app specifically for Android. Knowing that I'd be using Android Studio, and knowing the programming language used in it to be Kotlin, I could then think of how to code the app.

From that I made a diagram to show the program structure that will be used in the process of designing the app.

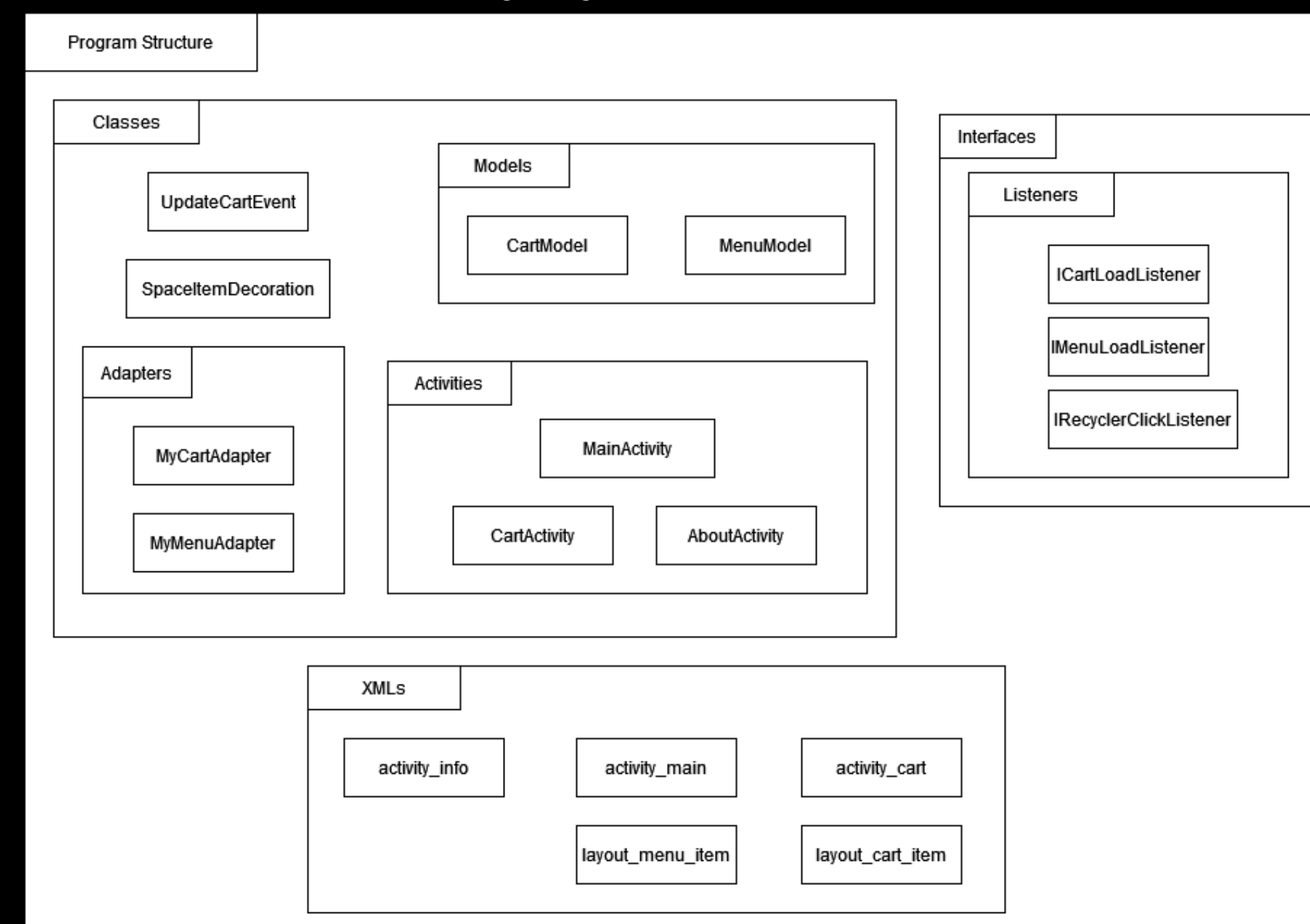


Figure 2: Program Structure for the app Minyx's Dinner. It shows the different sections that will be done when coding the app. This includes classes that will carry the bulk of the code and interactions. Interfaces that will make sure that listeners work well in the process of using buttons for the app. Lastly, XMLs that will hold the layouts that will ultimately be seen by the users.

We also needed a database that would work well with my app. There are multiple databases that can work for what I want but working with Android Studio I had the distinct advantage of using the already attached Firebase database, connecting them and filling up the information in the database.

Lastly, it is simply a slow process of coding and testing until the app is made.

## Results and Discussion

As a result of programming an app in Android Studio I ended up with an app that had a menu, a shopping cart, and an about page. The menu would contain the food and its prices and they could be clicked to be added to the cart, not only that, but the menu was updated real time from the database. So should I change anything in the database, the menu in the app would change as well. The shopping cart would obtain the information from the database for the products, and be updated from items selected from the menu, it would also show total price and allow the same product to be multiplied. Lastly, I had an About page with my information and the name of the app.

In total Minyx's Dinner had 3 layouts to show the users.

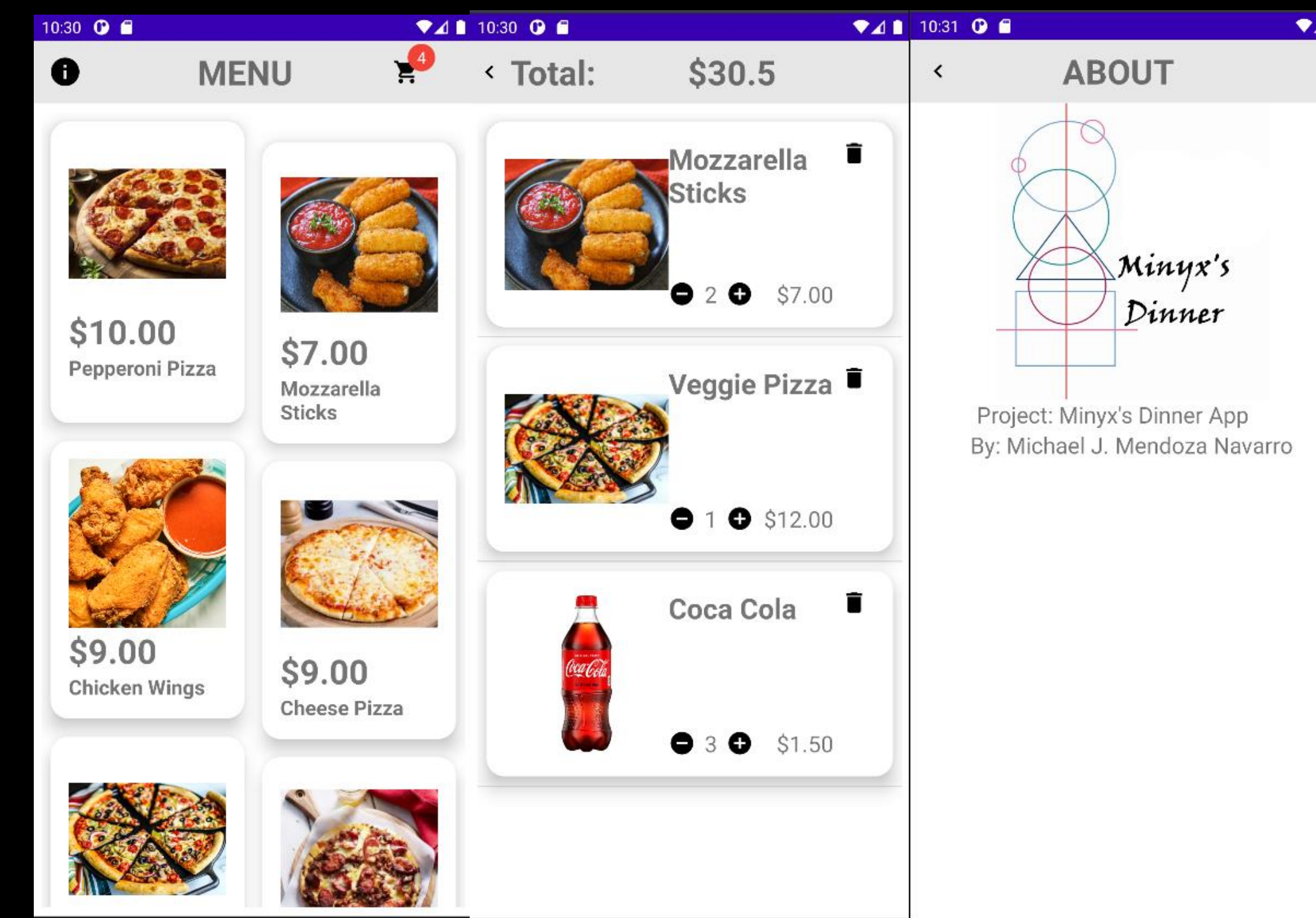


Figure 3: This figures show the 3 different screens showed in Minyx's Dinner app. It starts off in the Menu where one can go to either the shopping cart or the about. The shopping cart then shows the food selected, the number selected and the total cost. Lastly, the About screen shows the app information.

In the process of making the app, I ended up making a real-time Firebase database to work for it. This database contained a object for the unique user ID, but more importantly, it contained all the product information. Those being the image, the price, and the name of the product.

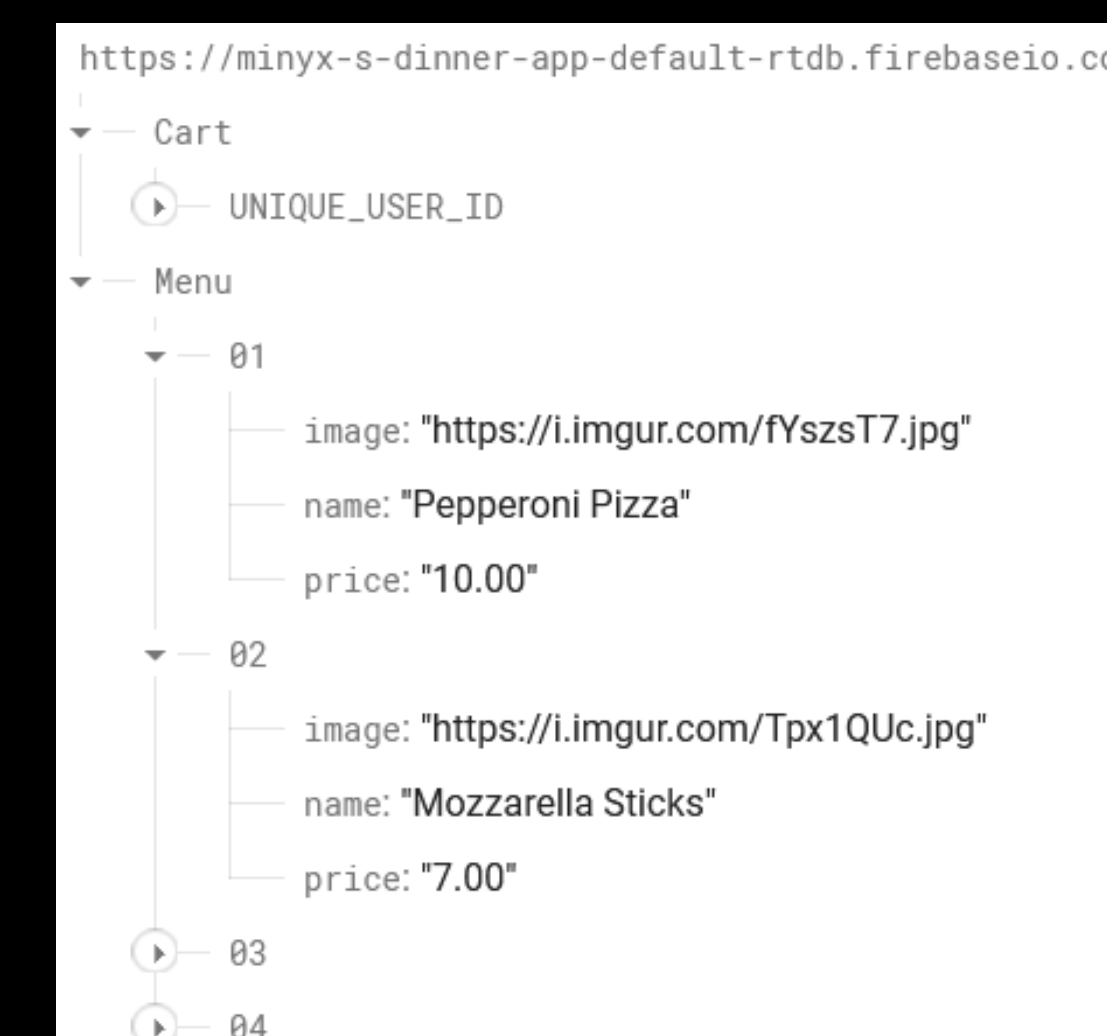


Figure 4: Firebase Database with unique user ID and product information. New products can be added to the list to update the app in real time.

I also tested the app to make sure that it worked well not only on phones, but also on tablets. This was done since all Android phone apps can also be downloaded in Android tablets.

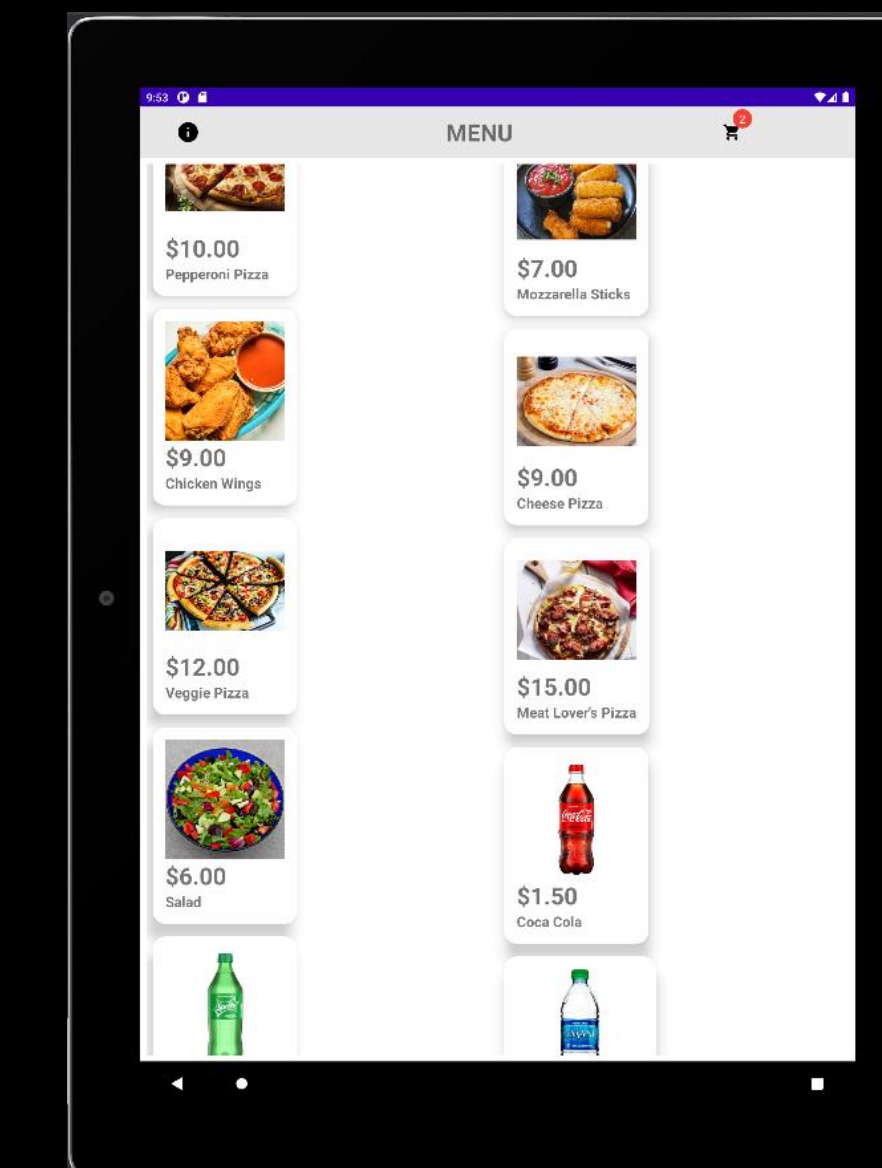


Figure 5: Test for Minyx's Dinner app on a tablet.

## Conclusions

The objective of this project was to make a program representing a food ordering app for a phone. As such, I showed what a food ordering app would be like and the work that would go into it. The code for what may seem like a simple app is extensive as shown in figure 2 with all the different sections that the program would have just to work. For this project I learned how to work with the Kotlin programming language and the rest of the process that one needs to do when using Android Studio. Besides that, I also learned how to work with the Firework database and how that works when using it in conjunction with an app. The program successfully adds a menu straight from the database and dynamically adds the products into the menu and shopping cart so that the products can be modified at will in the database without causing any issue in the app. In conclusion, I had a well functioning app that gave the user a food ordering app's experience.

## Future Work

- Future work for this project would be divided into three areas:
- Login Screen with username and password. Two objects that would have to be added to the Firebase database.
  - A screen with estimated time that would likely require a Google Maps attachment to be able to estimate the time by using the Google estimate with the map locations.
  - Settings screen with user information for checkout.

## Acknowledgements

I would like to acknowledge Dr. Jeffrey Duffany for allowing me to go through with my idea for an app for phones and assisting me with the process of approval and revision.

## References

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