

An Android Development Project Report On

GROCERY LIST APPLICATION USING KOTLIN IN ANDROID STUDIO

SUBMITTED BY:

SRIJITA SHIL

UNDER



SPS_APL_20220097394

Virtual Internship - Android Application

Development Using Kotlin

INDEX

CHAPTER 1: Introduction

- a. Abstract
- b. Objective
- c. Problem Targeted
- d. Problem's Primary Goals
- e. Introduction

CHAPTER 2: Background & Diagrams

- a. Background
- b. Context Diagram

CHAPTER 3: Technical Requirements

- a. Software
- b. Hardware

CHAPTER 4: Implementation and Designing

- a. MVVM
- b. ROOM DATABASE
- c. RECYCLERVIEW
- d. COROUTINES
- e. Step 1 to Step 8

CHAPTER 5: Conclusion and Future Scope

- a. Expected Outcome
- b. Conclusion &Future Scope

CHAPTER 6: URLs, Ids, Acknowledgements, Reflection Notes and References

- a. URLs & Account Ids
- b. Acknowledgements
- c. Reflection Notes
- d. References

CHAPTER 1: Introduction

a. ABSTRACT

Shopping is one of the activities that some people consider part of their life, while others do not even think of it. This comparison makes us discover people's problems with shopping. People have shopping problems such as limited time, expats in foreign countries without cars, a transportation issue, people consider physical shopping as a waste of time, health issues, long-distance to market and the difficulty in obtaining some items.

As the problems mentioned above, we have explored our idea, which is related to personal shopping. Therefore, we have built an application that combines different market shops, i.e. (Malls, supermarkets, and pharmacies).

This personal grocery shopping is an innovative app that allows the customers to get all their needs and suggest items based on previous history. Then deliver items to their doorstep and can facilitate online shopping procedure where customers can browse unlimited products all at one time. This work supports people in exploiting their time to be safer and more accessible than wasting it physically.

Moreover, people can order the product from home instead of going around for long distances for shopping. In addition, this app could help people who are facing health problems and unable to buy something physically to avoid future problems.

Finally, some people do not have transportation methods for shopping, and they should keep pace with the evolution.

b. OBJECTIVE

The main aim of this project is to list the items so that whenever users go to grocery stores, users will not be able to forget their items and this grocery application helps the users to tackle their day to day chaos more effortlessly.

c. PROBLEM TARGETED

It's not easy for the users to remember every item in this hectic lifestyle, they frequently can't recall their required necessity so we decided to build an app to store the items in the database for their future use. After buying the items users can delete the added items in the

database.

d. PROBLEM'S PRIMARY GOALS

The goal of this project is to make an app that stores the user items in a cart and can modify and delete the added item in the list. To develop a reliable system, I have some specific goals such as:

- Develop a system such that users can add item details like product name, product Quantity, and Product Price.
- Develop a database room that is used to store the user data which already been added by the user in the cart and the user can also remove the previously added item in the cart.
- Develop a good UI design that user friendly to the user.
- Develop a good UI that is supported for all android devices.

e. INTRODUCTION

Android is an open-source operating system that runs on the Linux kernel. With the advent of new mobile technologies, the mobile application industry is advancing rapidly. Consisting of several operating systems like Symbian OS, iOS, blackberry, etc., Android OS is recognized as the most widely used, popular and user-friendly mobile platform. This open-source Linux kernel based operating system offers high flexibility due to its customization properties making it a dominant mobile operating system.

Android applications are developed using the java language. Google has its own Software Development Kit (SDK) which enables these java codes to control devices like mobile phones, tablets, etc. Android mobile application development provides a flexible platform for developers where they can use both java Integrated Development Environment (IDEs) and android java libraries.

Google android SDK delivers a special software stack that provides developers an easy platform to develop android applications. Moreover, developers can make use of existing java IDEs which provides flexibility to the developers. Java libraries are predominant in the process of third-party application development. Cross-platform approaches make sure that developers do not have to develop platform-dependent applications. With the

help of these approaches, an application can be deployed to several platforms without the need for changes in coding. However, android is more prone to security vulnerabilities which the majority of the users do not take into account.

Any android developer can upload their application on the android market which can cause a security threat to any android device. These applications do not have to go through rigorous security checks.

Android is an open source and Linux-based Operating System for mobile devices such as smartphones and tablet computers. Android was developed by the Open Handset Alliance, led by Google, and other companies.

Android offers a unified approach to application development for mobile devices which means developers need only develop for Android, and their applications should be able to run on different devices powered by Android. The first beta version of the Android Software Development Kit (SDK) was released by Google in 2007 whereas the first commercial version, Android 1.0, was released in September 2008.

On June 27, 2012, at the Google I/O conference, Google announced the next Android version, 4.1 Jelly Bean. Jelly Bean is an incremental update, with the primary aim of improving the user interface, both in terms of functionality and performance.

The source code for Android is available under free and open source software licenses. Google publishes most of the code under the Apache License version 2.0 and the rest, Linux kernel changes, under the GNU General Public License version 2.

We are going to build a grocery application in android using Android Studio. Many times we forget to purchase things that we want to buy, after all, we can't remember all the items, so with the help of this app, you can note down your grocery items that you are going to purchase, by doing this you can't forget any items that you want to purchase. In this project, we are using (MVVM) for architectural patterns, Room for database, RecyclerView and Coroutines to display the list of items.

CHAPTER 2: Background & Diagrams

a. BACKGROUND

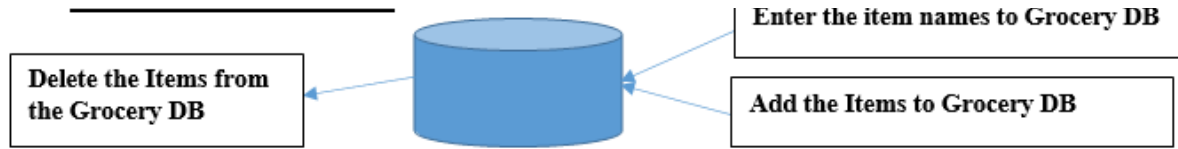
The grocery cart application project will help the user or admin to store the list of items in proper sequence. User/Admin can add and remove the items in the list according to his/her will.

i. UI DESIGN IN THE ANDROID PLATFORM

ii. ANDROID APPLICATION DEVELOPMENT

iii. DATABASE CONNECTION TO STORE USER DATA

b. CONTEXT DIAGRAM



CHAPTER 3: Technical Requirements

c. SOFTWARE

The Software Package is developed using Kotlin and Android Studio, basic SQL commands are used to store the database.

Operating System:

Windows 10

Software: Kotlin

Emulator: Pixel 4 API

30

d. HARDWARE

RAM: 16

GB RAM

ROM: 20

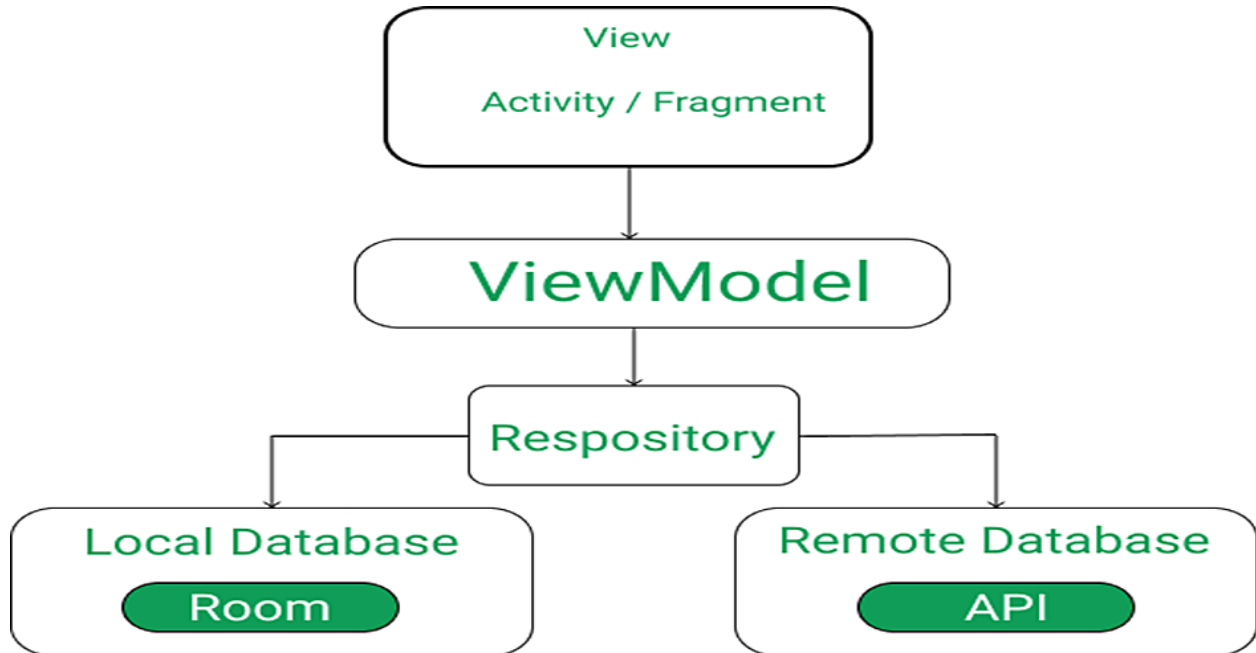
GB ROM

CHAPTER 4: Implementation and Designing

In this project, we are using MVVM (Model View ViewModel) for architectural patterns, **Room** for database, Coroutines and RecyclerView to display the list of items.

MVVM (Model View ViewModel)

MVVM architecture in android is used to give structure to the project's code and understand code easily. MVVM is an architectural design pattern in android. MVVM treat Activity classes and XML files as View. This design pattern completely separate UI from its logic. Here is an image to quickly understand MVVM.



ROOM Database

Room persistence library is a database management library and it is used to store the data of apps like grocery item name, grocery item quantity, and grocery item price. Room is a cover layer on SQLite which helps to perform the operation on the database easily.

RecyclerView

-

RecyclerView is a container and it is used to display the collection of data in a large amount of dataset that can be scrolled very effectively by maintaining a limited number of views.

-

Coroutines

-

Coroutines are a lightweight thread, we use coroutines to perform an operation on other threads, by this our main thread doesn't block and our app doesn't crash.

Step By Step

Process Step 1: Create a New Project

To create a new project in Android Studio please refer to [How to Create/Start a New Project in Android Studio](#). Note that select **Kotlin** as the programming language.

Step 2: Before going to the coding section first you have to do some

pre-task Before going to the coding part first add these libraries in your gradle_file_and also apply the plugin as 'kotlin-kapt'. To add these library go to **Gradle Scripts > build.gradle (Module: app)**.

Step 3: Implement Room Database

1. Entities class

The entities class contains all the columns in the database and it should be annotated with @Entity (tablename = "Name of table"). Entity class is a data class. And @Column info annotation is used to enter column variable name and datatype. We will also add Primary Key for auto-increment. Go to **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create Kotlin file/class and name the file as **GroceryEntities**. See the code below to completely understand and implement.

2. DAO Interface

The DAO is an interface in which we create all the functions that we want to implement on the database. This interface also annotated with @Dao. Now we will create a function using suspend function which is a coroutines function. Here we create three functions, First is the insert function to insert items in the database and annotated with @Insert, Second is for deleting items from the database annotated with @Delete and Third is for getting all items annotated with @Query. Go to the **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create Kotlin file/class and name the file as **GroceryDao**. See the code below to implement.

3. Database class

Database class annotated with @Database(entities = [Name of Entity class.class], version = 1) these entities are the entities array list all the data entities associating with the database and version shows the current version of the database. This database class inherits from the Room Database class. In **GroceryDatabase** class we will make an abstract method to get an instance of DAO and further use

this method from the DAO instance to interact with the database. Go to the **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create Kotlin file/class as **GroceryDatabase**.

Step 4: Now we will implement the Architectural Structure in the App

a. Repository class

The repository is one of the design structures. The repository class gives the data to the ViewModel class and then the ViewModel class uses that data for Views. The repository will choose the appropriate data locally or on the network. Here in our Grocery Repository class data fetch locally from the Room database. We will add constructor value by creating an instance of the database and stored in the db variable in the Grocery Repository class. Go to the **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create Kotlin file/class as **GroceryRepository**. Go to **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create a new Package called **UI** and then right-click on UI package and create a Kotlin file/class.

b. ViewModel class

ViewModel class used as an interface between View and Data. Grocery View Model class inherit from View Model class and we will pass constructor value by creating instance variable of Repository class and stored in repository variable. As we pass the constructor in View Model we have to create another class which is a Factory View Model class. Go to **app > java > com.example.application-name > UI**. Right-click on the UI package and create a Kotlin file/class and name the file as **GroceryViewModel**.

C. FactoryViewModel class

We will inherit the Grocery ViewModelFactory class from ViewModelProvider. NewInstanceFactory and again pass constructor value by creating instance variable of GroceryRepository and return GroceryViewModel (repository). Go to the **app > java > com.example.application-name > UI**. Right-click on the UI package and create a Kotlin file/class name it **GroceryViewModelFactory**.

Step 5: Now let's jump into the UI part

In the **activity_main.xml** file, we will add two ImageView, RecyclerView, and Button

after clicking this button a **DialogBox** open and in that dialog box user can enter the item name, item quantity, and item price.

Step 6:

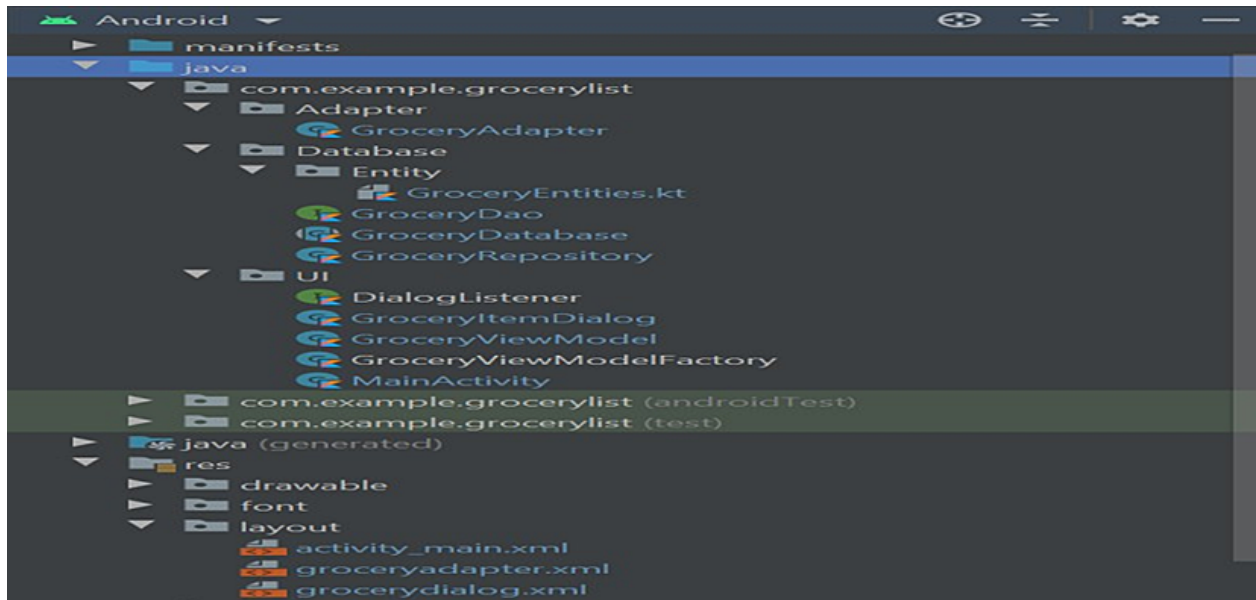
Let's implement **RecyclerView**. Now we will code the UI part of the row in the list. Go to **app > res > layout**. Right-click on layout, go to new, and then add a **Layout Resource File** and name it as **GroceryAdapter**. We will code adapter class for recyclerview. In the GroceryAdapter class, we will add constructor value by storing entities class as a list in list variable and create an instance of the view model. In Grocery Adapter we will override three functions: onCreateViewHolder, getItemCount, and onBindViewHolder, we will also create an inner class called grocery view holder. Go to the **app > java > com.example.application-name**. Right-click on **com.example.application-name** go to new and create a new Package called **Adapter** and then right-click on Adapter package and create a Kotlin file/class name it **GroceryAdapter**.

Step 7:

To enter grocery item, quantity, and price from the user we have to create an interface. To implement this interface we will use DialogBox. First create UI of dialog box. In this dialog box we will add three edit text and two text view. Three edit text to enter grocery item name, quantity and price. Two text view one for save and other for cancel. After clicking the save text all data saved into the database and by clicking on the cancel text dialog box closes. Go to the **app > res > layout**. Right-click on **layout**, go to new and then add a **Layout Resource File** and name it as **GroceryDialog**. To add a click listener on save text we have to create an interface first in which we create a function. Go to the **app > java > com.example.application-name > UI**. Right-click on the **UI** package and create a Kotlin file/class and create an **interface** name it as **DialogListener**.

Step 8:

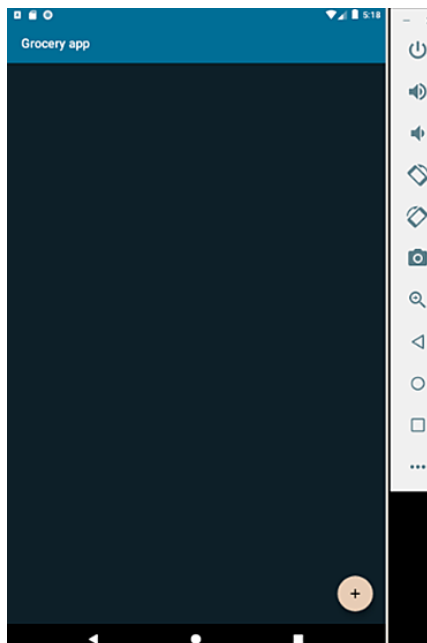
In this final step we will code in our **MainActivity**. In our **MainActivity**, we have to set up the recyclerview and add click listener on add button to open the dialog box.

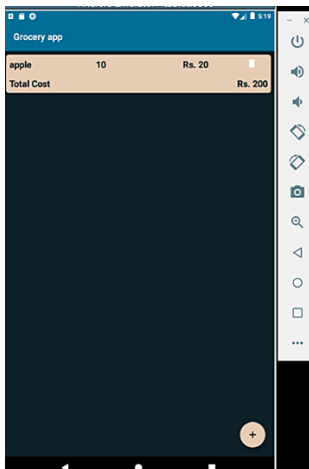
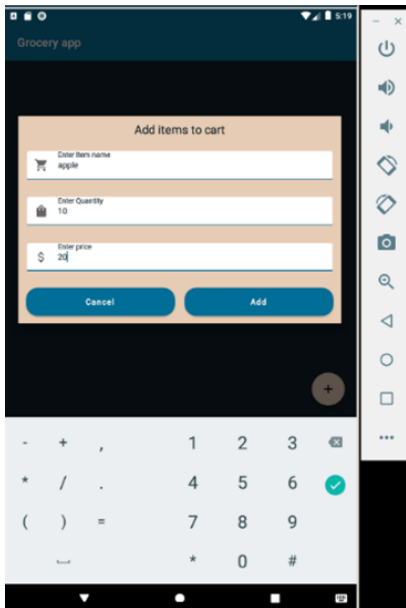
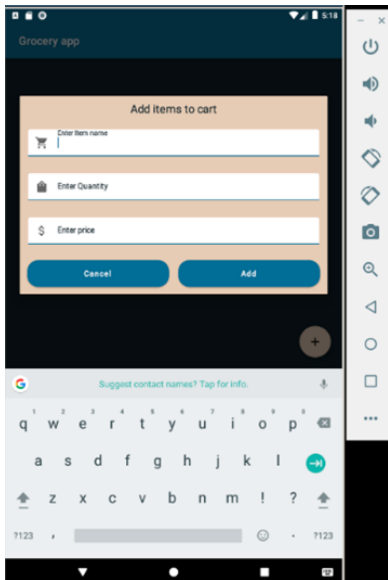


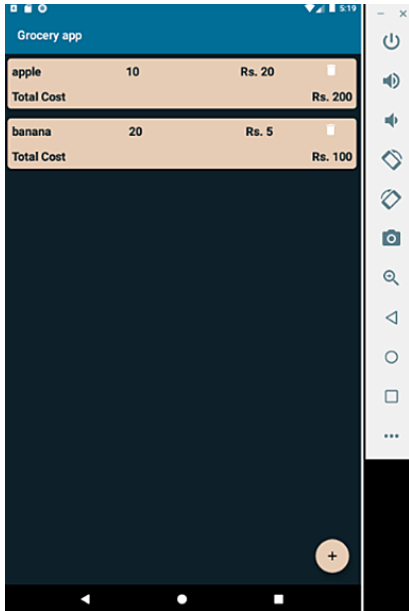
Complete Project Structure

CHAPTER 5: Conclusion and Future Scope

a. Expected Outcome







CHAPTER 6: URLs, Ids, Acknowledgements, Reflection Notes and References

URLs &

Account

Ids

GitHub URL:

<https://github.com/smart>

internz02/SPSGP-

83161-Virtual-

Internship---Android-

Application-

Development-Using-

Kotlin

Smart Internz Registered

ID:

srijitashil3@gmail.com

a. Acknowledgements

I have taken much efforts in this project. However, it would not have been possible without the kind support and help of many individuals and organizations. I would like to extend my sincerethanks to all of them.

I am highly indebtedto SMARTINTERNZ (Experiential Learning & Remote Externship Platform to bring academia & industry very close for a common goal of talent creation) for their guidance and constant supervision as well as for providing necessary information regarding the project & also for their support in completing the project. I would like to express my gratitude towards member of (Smart Internz) for their kind co-operation and encouragement which help mein completion of this project.

I would like to express my special gratitude and thanks to industry persons for giving me suchattention and time.

My thanksand appreciations also go to people who have willingly helped me out with theirabilities.

a. References

- <https://github.com/divyanshu15/GroceryApp>
- <https://youtu.be/5YmJLB8f3W0>
- https://www.youtube.com/watch?v=vdcLb_Y71lc
- <https://www.geeksforgeeks.org/introduction-to-android-development/#:~:text=Google%20first%20publicly%20announce,d%20Android,with%20the%20version%20Android%201.0>

- <https://www.geeksforgeeks.org/introduction-to-kotlin/>