An Android Development Project Report On

GROCERY LIST APPLICATION USING KOTLIN IN ANDROID STUDIO

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UNDER

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Virtual Internship - Android Application Development UsingKotlin

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CHAPTER 1: Introduction

a. ABSTRACT

Shopping is one of the activities that some peopleconsider part of their life, while others do noteven 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- distanceto 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 differentmarket 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 canfacilitate 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 unableto buy something physically to avoid future problems.

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

b. OBJECTIVE

The main aim of this project is to list the items so that whenever users go to grocery stores, userswill 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’trecall their requirednecessity so we decided to build an app to store the items in the databasefortheir futureuse. After buying the items users can deletethe added items in the

database.

d. PROBLEM'S PRIMARY GOALS

The goal of this project is to make anapp that storesthe user itemsin a cart and canmodify anddelete 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 bythe user in the cart and the user can also remove the previously added item in the cart.
- Develop a good UI design that user friendlyto the user.
- Develop a good UI that is supported for all androiddevices.

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 kernelbased 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. Androidmobile application development provides a flexibleplatform for developerswhere 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 whichprovides 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 securityvulnerabilities 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 asecurity threat to any android device. These applications do not have to go through rigorous securitychecks.

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 byGoogle, 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 releasedin September 2008.

On June 27, 2012, at the Google I/O conference, Google announced the next Android version, 4.1Jelly 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. Googlepublishes 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,Recycler View and Coroutines to displaythe list of items.

CHAPTER 2: Background & Diagrams

a. BACKGROUND

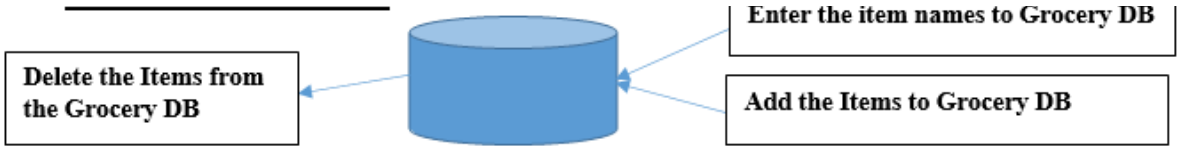
The grocery cart application project will help the user or admin to store the list of items in propersequence. User/Admin can add and remove the items in the list accordingto his/her will.

i. UI DESIGN IN THE ANDROID PLATFORM

ii. ANDROID APPLICATION DEVELOPMENT

iii. DATABASE CONNECTIONTO STORE USER DATA

b. CONTEXT DIAGRAM



c. SOFTWARE

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

Operating System:

Windows10

Software: Kotlin

Emulator: Pixel 4 API

30

d. HARDWARE

RAM: 16
GB RAM

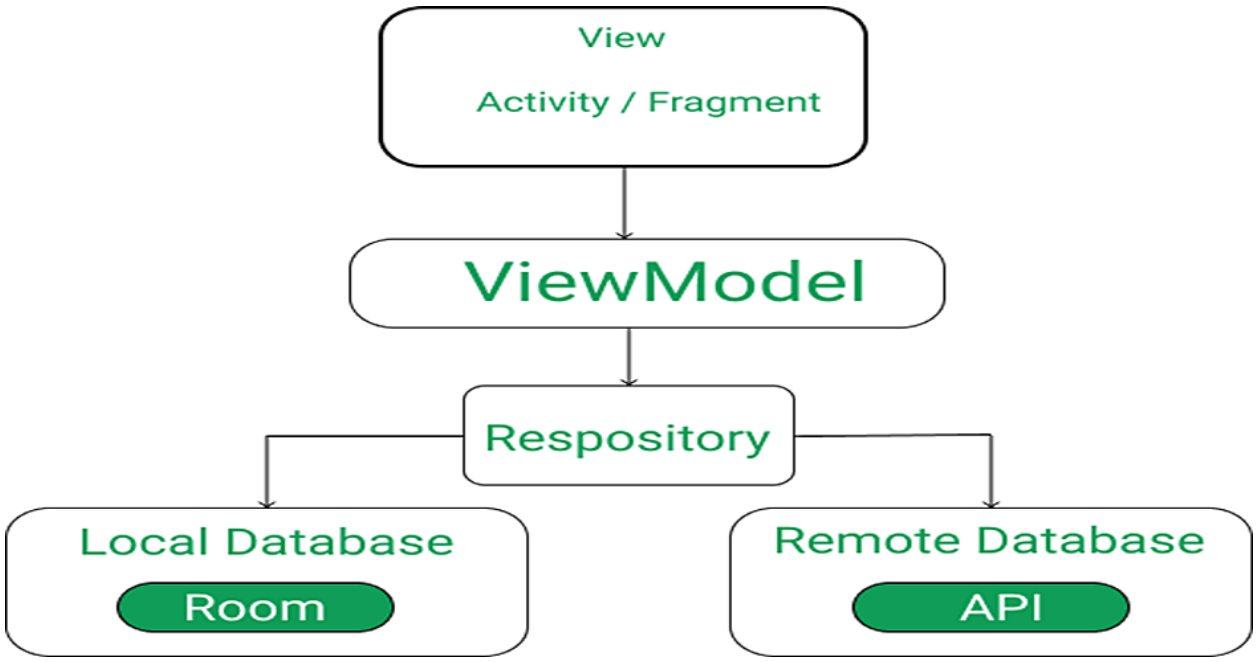
ROM:20
GB ROM

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 structureto the project's code and understand code easily. MVVM is an architectural design pattern in android. MVVM treat Activity classesand XML files as View. This design pattern completelyseparate 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 operationon the database easily.

RecycleView

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 otherthreads, by this our main thread doesn't block and our app doesn't crash.

Step By Step

ProcessStep 1: Create a New Project

To create a new projectin 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-taskBefore 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: ImplementRoom Database

1. ### Entities class

The entitiesclass contains all the columnsin 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 fileas **GroceryEntities**. See the code below to completely understand and implement.

2. DAO Interface

The DAO is an interface in which we create all the functionsthat we want to implementon the database. This interfacealso annotated with @Dao. Now we will create a function usingsuspend function which is a coroutines function.Here we create three functions,First is the insert function to insert items in the databaseand annotated with @Insert, Second is for deleting items from the database annotatedwith @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 entitiesare the entities array list all the data entitiesassociating with the database and version shows the currentversion of the database. This database class inherits from the Room Database class. In **GroceryDatabase** classwe will make an abstract method to get an instance of DAO and further use

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

Step 4: Now we will implementthe Architectural Structurein the App

a. Repository class

The repositoryis one of the design structures. The repository class gives the data to the ViewModelclass and then the ViewModelclass uses that data for Views. The repository will choose the appropriate data locally or on the network. Here in our Grocery Repositoryclass data fetch locally from the Room database. We will add constructor value by creatingan instance of the databaseand stored in the db variable in the Grocery Repository class. Goto 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 thenright-click on UI package and create a Kotlin file/class.

b. ViewModel class

ViewModel class used as an interfacebetween View and Data. Grocery View Model class inherit from View Model class and we will pass constructor value by creatinginstance variable of Repository class and stored in repositoryvariable. As we pass the constructor inView 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 andcreate a Kotlin file/classand 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 Kotlinfile/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, itemquantity, and item price.

Step 6:

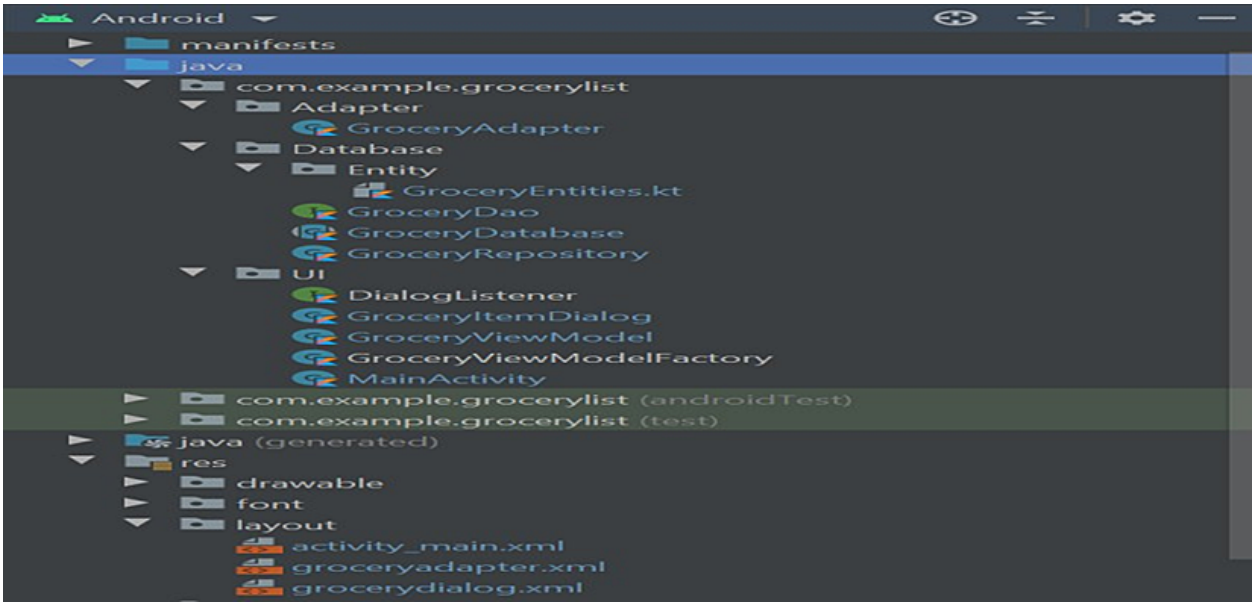
Let's implement **RecyclerView**. Now we will code the UI part of the row in the list. Go to **app > res > layout**. Right-click on layout, go to new, and then add a **Layout Resource File** and name it as **GroceryAdapter**. We will code adapter class for recyclerview. In the GroceryAdapter class, we will add constructor value by storingentities class as a list in list variable and create an instance of the view model. In Grocery Adapterwe will override three functions: onCreateViewHolder, getItemCount, and onbindViewHolder, we will also create aninner 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, quantityand price. Two text view one for save and other for cancel. After clicking the save textall data saved into the databaseand 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 clicklistener 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:

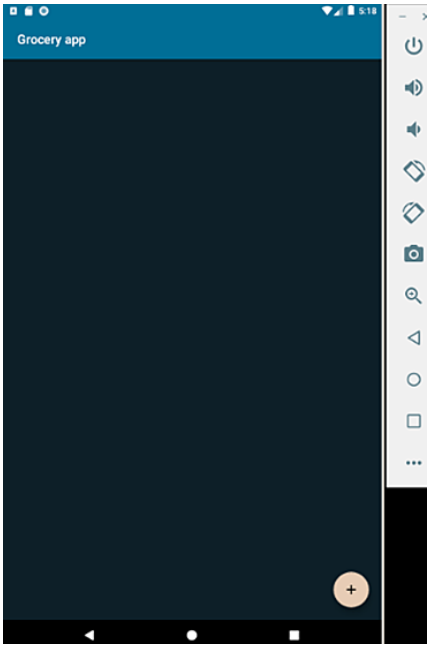
In this final step we will code in our **MainActivity**. In our **MainActivity**, we have to set up therecyclerview and add click listener on add button to open the dialog box.

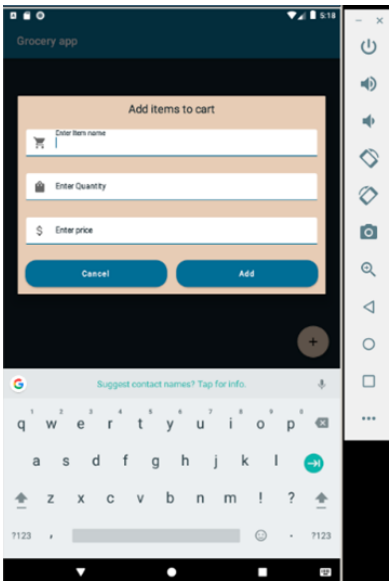


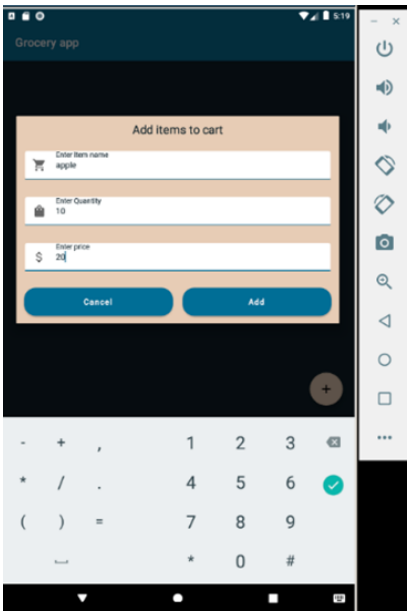
Complete Project Structure

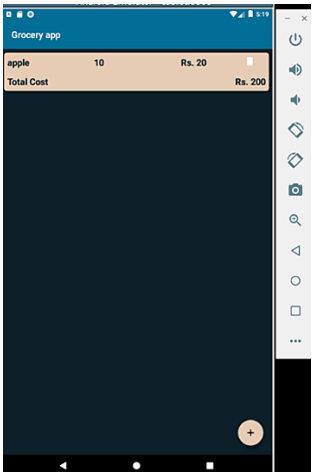
CHAPTER 5: Conclusion and Future Scope

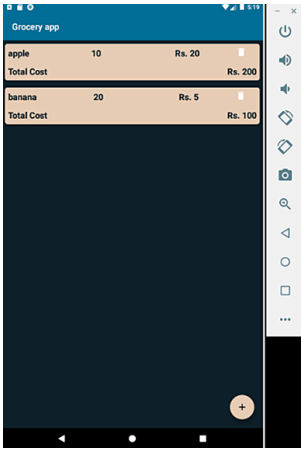
a. Expected Outcome




Grocery app
Add items to cart
Enter Item name
Enter Quantity
Enter price
Cancel
Add
Suggest contact names? Tap for info.


Grocery app
Add items to cart
Enter Item name
apple
Enter Quantity
10
Enter price
20
Cancel
Add


Grocery app
apple
10
Rs. 20
Total Cost
Rs. 200



ADVANTAGES & DISADVANTAGES

Advantages

1. Easier to maintain item list compared in this form compared to pen-paper
2. Easier to tally money spent on each item if we are buying multiple of it as it tells total cost of item for the quantity.

Disadvantages

1. Currently only support single user's single list.
2. No authentication so anyone can access the list if they have access to list.
3. No categorization or history of past data.

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

URLs & Account IDs:

GitHub URL:
https://github.com/smartinternz02/SPSGP-83161-Virtual-Internship---Android-Application-Development-Using-Kotlin

Smart Internz Registered Email Id:
srijitashil3@gmail.com

Smart Internz Id:
https://smartinternz.com/student-profile/feed/U0IyMDIyMDIzNDYzNA==

a. Acknowledgements

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

a. References

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- https://www.youtube.com/watch?v=vdcLb_Y71Ic
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- https://www.geeksforgeeks.org/introduction-to-kotlin/