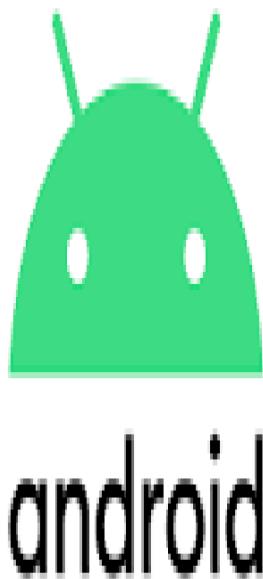


**GROCERY LIST APP
USING KOTLIN AND ANDROID STUDIO**



SUBMITTED BY:

PRATHEEKSHA

Supported by In Collaboration with

 SMARTBRIDGE Let's Bridge the Gap  Google Developers 

**Google Supported FDP &
Virtual Internship Program**

ANDROID BASICS IN KOTLIN

**GOOGLE SUPPORTED
Virtual Internship – Android Application
Development Using Kotlin**

Table Of Content

1. Introduction

- Overview
- Purpose

2. Literature Survey

- Existing Problem
- Proposed Solution

3. Theoretical Analysis

- Block Diagram
- Hardware / Software Designing

4. Experimental Investigations

- Analysis Or the Investigation Made While Workingon The Solution.

5. Flowcharts

- Diagram Showingthe Control Flow of The Solution

6. Results

- Final Findings(Output) Of the Project Alongwith Screenshots.

7. Advantages & Disadvantages

- ListOf Advantages andDisadvantages of The Proposed Solution

8. Applications

- The Areas Where This Solution Can Be Applied

9. Conclusions

- Conclusion Summarizing the Entire Work and Findings.

10. Future Scope

- Enhancements That Can Be Made in The Future.

11. Bibliography

- References Of Previous Works or Websites Visited/Books Referred For
- Analysis About the Project, Solution Previous Findings Etc.
- **Appendix**
- **A. SourceCode**

1. Introduction

1. Overview:

Grocery lister app, android based application helps user to simplify the daily chaos of remembering the stuff they need to buy. This provides active database to list items out and its price in very efficient way. In this project, we are using mvvm (model view viewmodel) for architectural patterns, room for database, coroutines and recycler view to display the list of items.

2. Purpose:

Grocery lister app aims to provide a comfortable experience while shopping daily need items. This project helps in assisting them in their tasks by providing a user-friendly interface to create list of items they want to buy and keep track of their purchases. This helps them to simplify the calculations by totalling the amount also making it easier to help them remember by saving it in database unless deleted. Its functionality also includes the taking note of items with quantity and amount mention.

2. Literature survey

a. Existing problem:

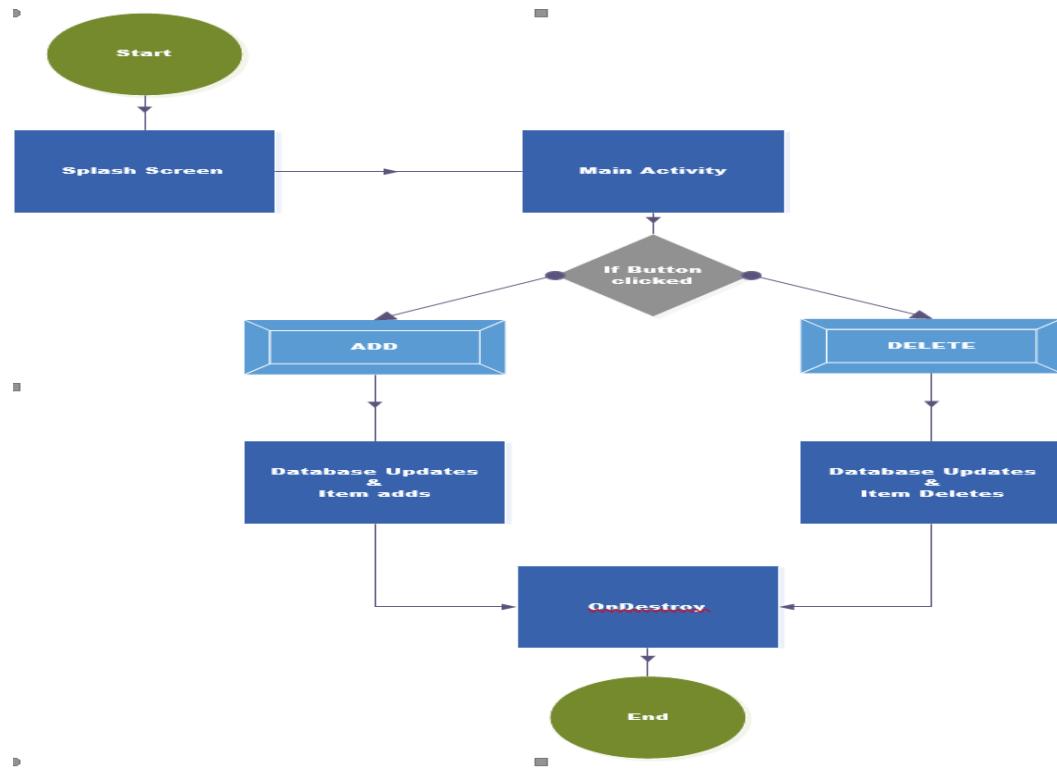
In general scenario most people go shopping while keeping notes in their head which they eventually end up forgetting about items they needed to buy, even while they keep it on paper note and carry it all along it has been seen that notes can actually get lost while travelling due to bad weather and also it gets difficult to add items while its on your mind and you in real crowded market. To deal with all scenarios for one and all there shall be something more reliable and durable which helps people to carry their list which can't be damaged easily in addition to which also allows to add items far easily.

b. Proposed solution:

For the easiness of people and making human mind less occupied over tiny stuff but also giving a new ease way to make their list of items in digital and efficient way, the grocery lister, an app with functionalities which allows adding and deleting of items in user friendly way also helps them note down price and do total with quantities provided.

3.Theoretical analysis

a.Block diagram



On start of application the splash screen shows up which constitutes app icon, it will be shown for almost around 1.7 seconds. After the splash screen goes away main screen comes in notice consisting of two buttons namely add and delete. Add button by default is at bottom while delete button appears when item is already added. After all required operations get done and app is been closed then after just action has been taken place it leads to updating of database either deletion or addition of items from it.

b.Hardware / Software designing:

Software:

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

Operating System:

Windows 11

Software Languages:Kotlin
and Java

Emulator:

Pixel 4 API 30 3.2

Hardware:

RAM: 16 GB RAM
ROM: 20
GB ROM

4.Theoretical analysis

- The project has been developed using Kotlin programming language.
- The software, Android Studio used to develop application.
- For other testing purposes the emulator has been used and also been tested upon Android phone (specific model: Samsung A8+).
- 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 treats Activity classes and XML files as View. This design pattern separates UI from its logic. Here is an image to quickly understand MVVM.
- Room Database 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 is a container and it is used to display the collection of data in a large amount of data set that can be scrolled very effectively by maintaining a limited number of views.
- Coroutines are a lightweight thread, we use a coroutine to perform an

operation on other threads, 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 [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: ImplementRoom Database

a. 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 file as **GroceryEntities**. See the code below to completely understand and implement.

b. 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 using suspend 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.

c. 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.

a.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**.

b.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**.

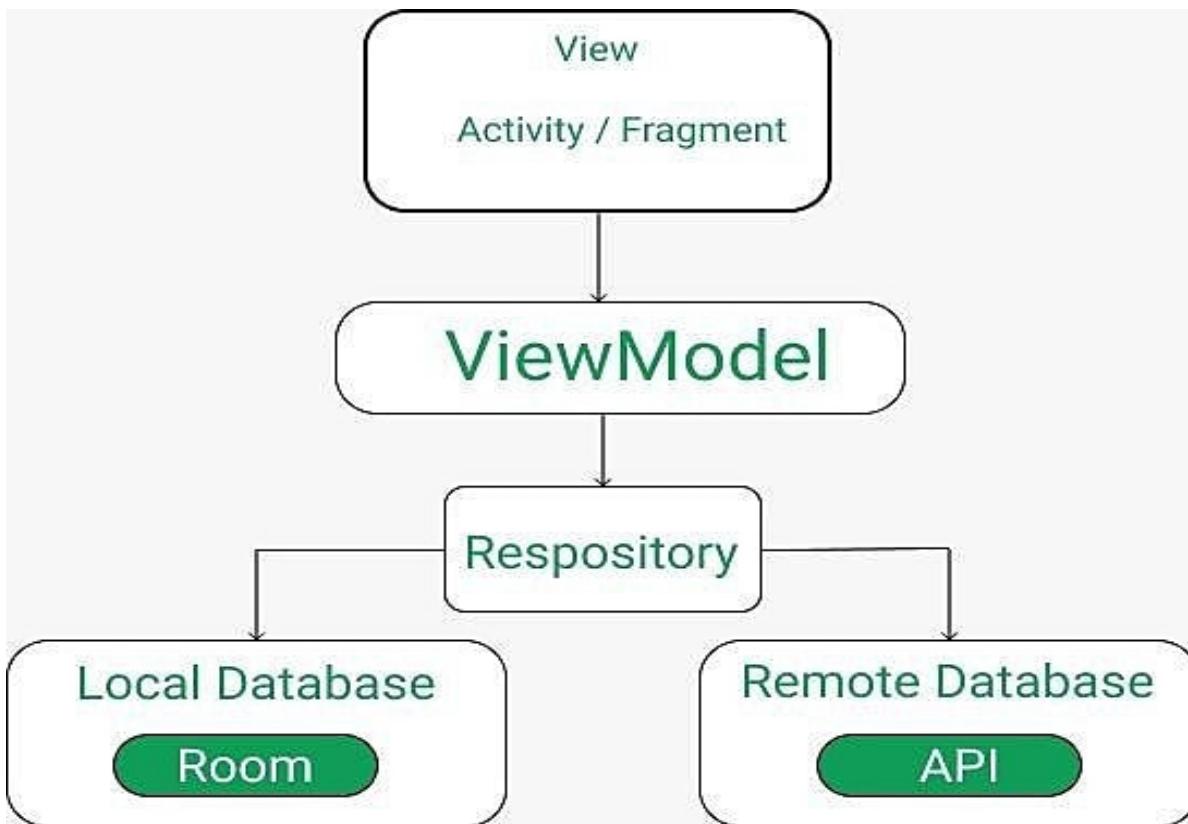
Step 7

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:

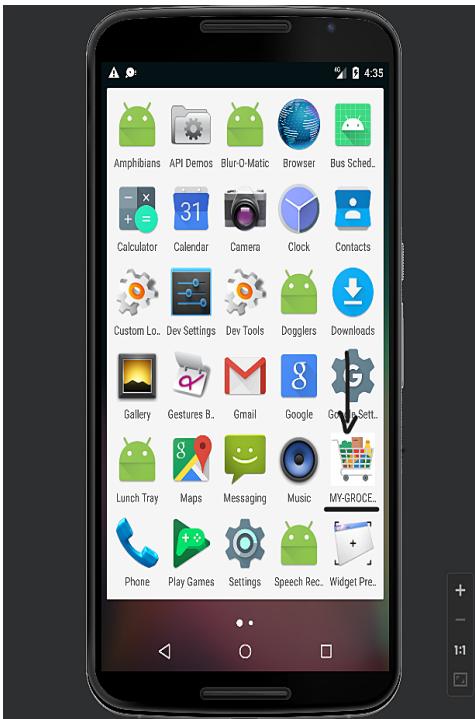
In this final step we will code in our **MainActivity**. In our **MainActivity**, we have to set up the recyclerview and add click listener on add button to open the dialog box.

5.Flowchart

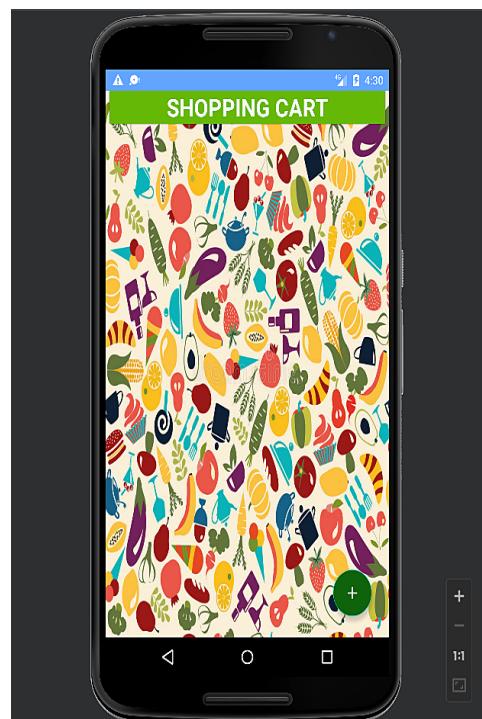


6.Result

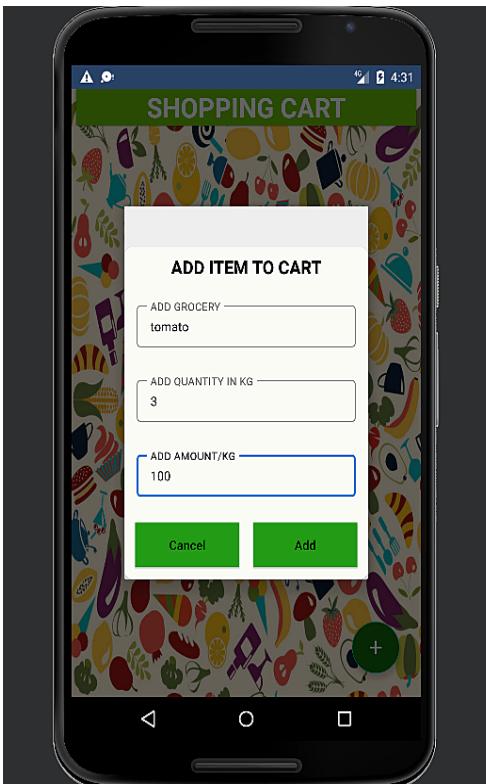
Grocery Lister App, Android based application helps user to simplify the daily chaos of remembering the stuff they need to buy. This project helps in assisting them in their tasks by providing a user-friendly interface to create list of items they want to buy and keep track of their purchases. This helps them to simplify the calculations by totalling the amount also making it easier to help them remember by saving it in database unless deleted. Its functionality also includes the taking note of items with quantity and amount mention.



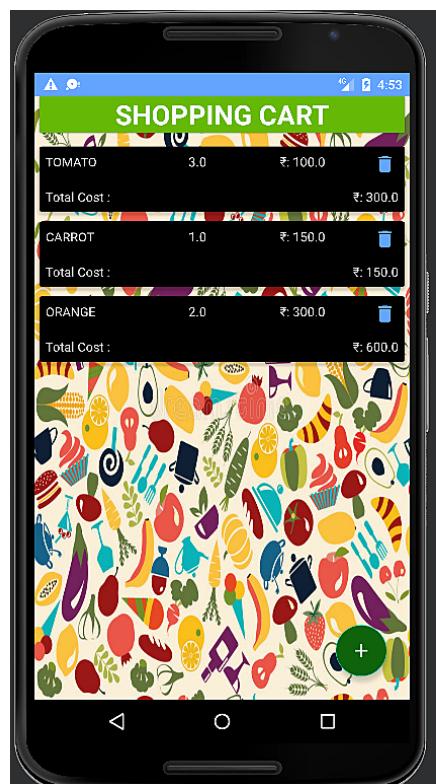
APP LOGO



MAIN PAGE OF APP



ADD AN ITEM DIAGLOGUE BOX



AFTER ADDING ITEM

7.Advantages &Disadvantages

Advantages:

1. Scope of this project includes giving users the ability to make lists of products they willing to purchase.
2. Application helps user to simplify the calculations by totalling the amount while also making it easier to help them remember by saving it in database unless deleted.
3. Its functionality also includes the taking note of items with quantity and amount mention.

Disadvantages:

4. This project doesn't give users the ability to buy a product from a shop (online).
5. It doesn't include information from real bank account to create an expense history.

8.Applications

Its application is but not limited to making items listing, managing items and price of data or items in the list. It can further be used to manage a total financial evaluation by total pricing it. Further, it can be applied to transaction history and which helps to evaluate it too.

9.Conclusion

This project helps in assisting them in their tasks by providing a user-friendly interface to create list of items they want to buy and keep track of their purchases. This grocery application will help to store the list of data items include name of item, price and quantity required. Admins store his/her data in the list, the grocery application very helpful to users.

10.Future Scope

This application helps to store the list of items by Admin. But also can integrate the transaction management so one can actually evaluate their financial expenditure

In Future we can also add scheduledaddition of items according to requirement of user.

The Featuresare:

- Add User Panel
- Add AdminPanel
- Provide Login Authentication
- Add Image to user Product and Rating

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<https://developer.android.com/courses/android-basics-kotlin/unit-3>

<https://developer.android.com/courses/android-basics-kotlin/unit-4>

<https://developer.android.com/courses/android-basics-kotlin/unit-5>

<https://developer.android.com/courses/android-basics-kotlin/unit-6>

APPENDIX

a. Source Code:

The image shows two screenshots of the Android Studio IDE displaying source code for a Kotlin-based Android application named "Grocery App".

Screenshot 1: GroceryDao.kt

```
File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Grocery App - GroceryDao.kt [Grocery_App.app.main]  
GroceryApp app src main java com examples groceryapp GroceryDao  
AndroidManifest.xml  
AndroidManifest.xml  
java com examples groceryapp  
GroceryDao  
GroceryDatabase  
GroceryItems  
GroceryRepository  
GroceryRVAdapter  
GroceryViewModel  
GroceryViewModelFactory  
MainActivity  
com androidTest  
com test  
com generated  
com com examples groceryapp BuildConfig  
com  
res drawable bg.jpg btn_bg.xml header_bg.xml ic_baseline_add.xml ic_baseline_delete_24.xml ic_launcher_background.xml ic_launcher_foreground.xml v24 shop.jpg layout  
Version Control TODO Problems Terminal Logcat Profiler App Inspection Event Log Layout Inspector 8:11 LF UTF-8 4 spaces  
daemon started successfully (2 minutes ago)  
Cloudy 84F 12:17 25-09-2022
```

```
1 package com.examples.groceryapp
2
3 import ...
4
5 @Dao
6
7 interface GroceryDao {
8     @Insert(onConflict = OnConflictStrategy.REPLACE)
9     suspend fun insert(item: GroceryItems)
10    @Delete
11    suspend fun delete(item: GroceryItems)
12    @Query("SELECT * FROM Grocery_items")
13    fun getAllGroceryItems(): LiveData<List<GroceryItems>>
14 }
```

Screenshot 2: GrocerDatabase.kt

```
File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Grocery App - GrocerDatabase.kt [Grocery_App.app.main]  
GroceryApp app src main java com examples groceryapp GrocerDatabase  
AndroidManifest.xml  
AndroidManifest.xml  
Java com examples groceryapp  
GroceryDao  
GroceryDatabase  
GroceryItems  
GroceryRepository  
GroceryRVAdapter  
GroceryViewModel  
GroceryViewModelFactory  
MainActivity  
com androidTest  
com test  
com generated  
com com examples groceryapp BuildConfig  
com  
res drawable bg.jpg btn_bg.xml header_bg.xml ic_baseline_add.xml ic_baseline_delete_24.xml ic_launcher_background.xml ic_launcher_foreground.xml v24 shop.jpg layout  
Version Control TODO Problems Terminal Logcat Profiler App Inspection Event Log Layout Inspector 11:16 LF UTF-8 4 spaces  
daemon started successfully (2 minutes ago)  
Cloudy 84F 12:17 25-09-2022
```

```
1 package com.examples.groceryapp
2
3 import ...
4
5 @Database(entities = [GroceryItems::class], version = 1)
6 abstract class GrocerDatabase : RoomDatabase() {
7
8     abstract fun getGroceryDao() : GroceryDao
9     companion object {
10         @Volatile
11         private var instance: GrocerDatabase? = null
12         private val LOCK = Any()
13
14         operator fun invoke(context: Context) = instance ?: synchronized(LOCK) {
15             instance?: createDatabase(context).also {
16                 instance = it
17             }
18         }
19
20         private fun createDatabase(context: Context) =
21             Room.databaseBuilder(
22                 context.applicationContext,
23                 GrocerDatabase::class.java,
24                 name: "GroceryApp.db"
25             ).build()
26     }
27 }
```

The screenshot shows the Android Studio interface with the code editor open to `GroceryItems.kt`. The code defines a data class `GroceryItems` with properties `itemName`, `itemQuantity`, and `itemPrice`, and a primary key `id`. The code editor has syntax highlighting and code completion suggestions.

```
package com.examples.groceryapp

import ...

@Entity(tableName = "Grocery_items")
data class GroceryItems (
    @ColumnInfo(name = "itemName")
    var itemName:String,
    @ColumnInfo(name = "itemQuantity")
    var itemQuantity:Double,
    @ColumnInfo(name = "itemPrice")
    var itemPrice:Double,
    @PrimaryKey(autoGenerate = true)
    var id:Int?=null
)
```

The screenshot shows the Android Studio interface with the code editor open to `GroceryRepository.kt`. The code defines a repository class with methods for inserting and deleting items from the database, and a method to get all items. The code editor has syntax highlighting and code completion suggestions.

```
package com.examples.groceryapp

class GroceryRepository(private val db:GroceryDatabase) {
    suspend fun insert(items: GroceryItems) = db.getGroceryDao().insert(items)
    suspend fun delete(items: GroceryItems) = db.getGroceryDao().delete(items)

    fun getAllItems() = db.getGroceryDao().getAllGroceryItems()
}
```

File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Grocery App - GroceryRVAdapter.kt [Grocery_App.app.main]

GroceryApp app src main java com examples groceryapp GroceryRVAdapter.kt

Resource Manager Project Device Manager

```
19
20     val totalIV = itemView.findViewById<TextView>(R.id.total_iv)
21     val deleteIV = itemView.findViewById<Imageview>(R.id.delete_iv)
22
23
24     interface GroceryItemClickListener{
25         fun onClick(groceryItems: GroceryItems)
26     }
27
28     override fun onCreateViewHolder(parent: ViewGroup, viewType: Int): GroceryViewHolder {
29         val view = LayoutInflater.from(parent.context).inflate(R.layout.grocery_rv_item, parent, false)
30         return GroceryViewHolder(view)
31     }
32
33     override fun onBindViewHolder(holder: GroceryViewHolder, position: Int) {
34         holder.nameTV.text = list.get(position).itemName
35         holder.quantityTV.text = list.get(position).itemQuantity.toString()
36         holder.rateIV.text = "₹ " + list.get(position).itemPrice.toString()
37         val itemTotal :Double = list.get(position).itemQuantity * list.get(position).itemPrice
38         holder.totalTV.text = "₹ " + itemTotal.toString()
39         holder.deleteIV.setOnClickListener { itemView ->
40             groceryItemClickListener.onClick(list.get(position))
41         }
42     }
43
44     override fun getItemCount(): Int {
45         return list.size
46     }
47 }
```

OneDrive Screenshot saved The screenshot was added to your OneDrive.

84°F Cloudy

File Edit View Navigate Code Refactor Build Run Tools VCS Window Help Grocery App - GroceryViewModel.kt [Grocery_App.app.main]

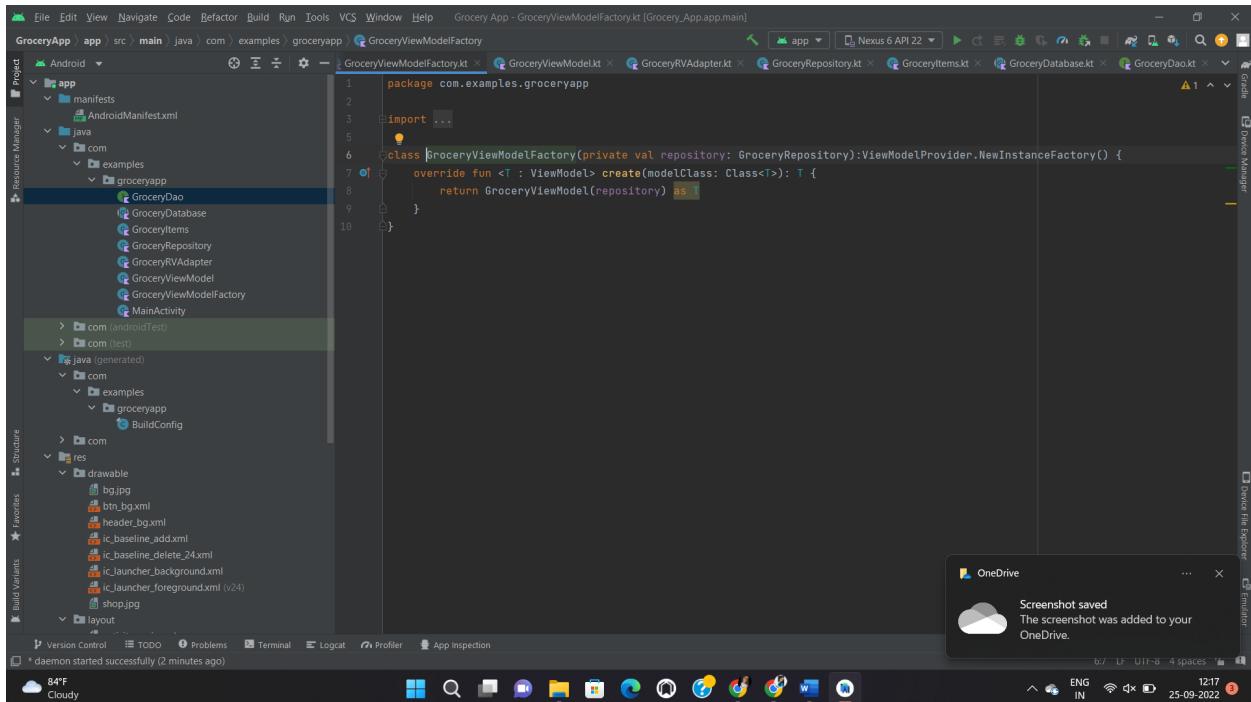
GroceryApp app src main java com examples groceryapp GroceryViewModel.kt

Resource Manager Project Device Manager

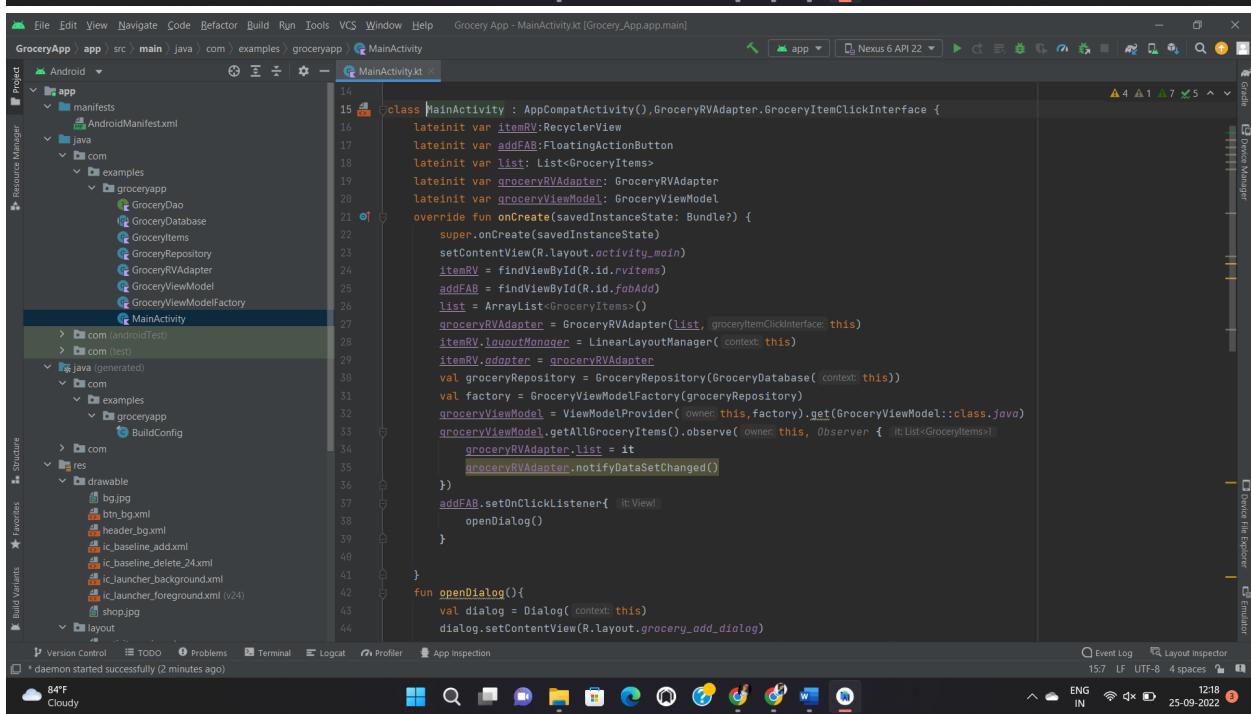
```
1 package com.examples.groceryapp
2
3 import ...
4
5 class GroceryViewModel(private val repository: GroceryRepository): ViewModel() {
6     fun insert(items: GroceryItems) = GlobalScope.launch { thisCoroutineScope
7         repository.insert(items)
8     }
9     fun delete(items: GroceryItems) = GlobalScope.launch { thisCoroutineScope
10        repository.delete(items)
11    }
12    fun getAllGroceryItems() = repository.getAllItems()
13
14 }
```

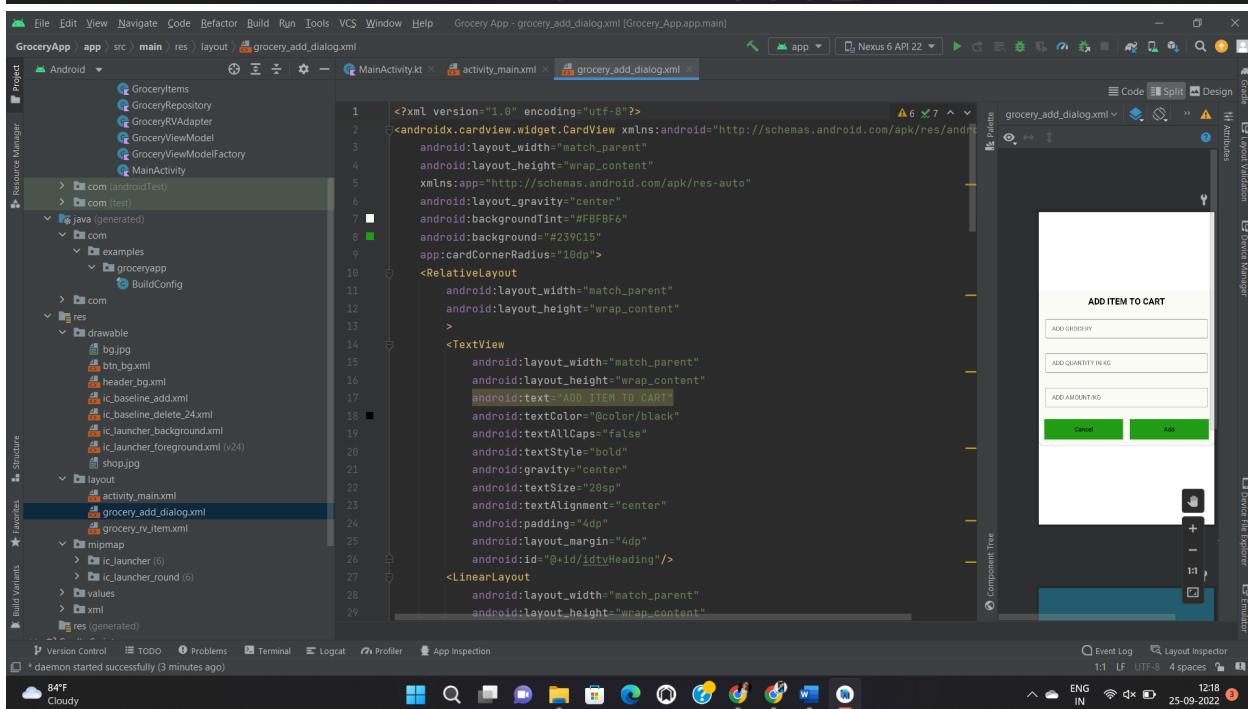
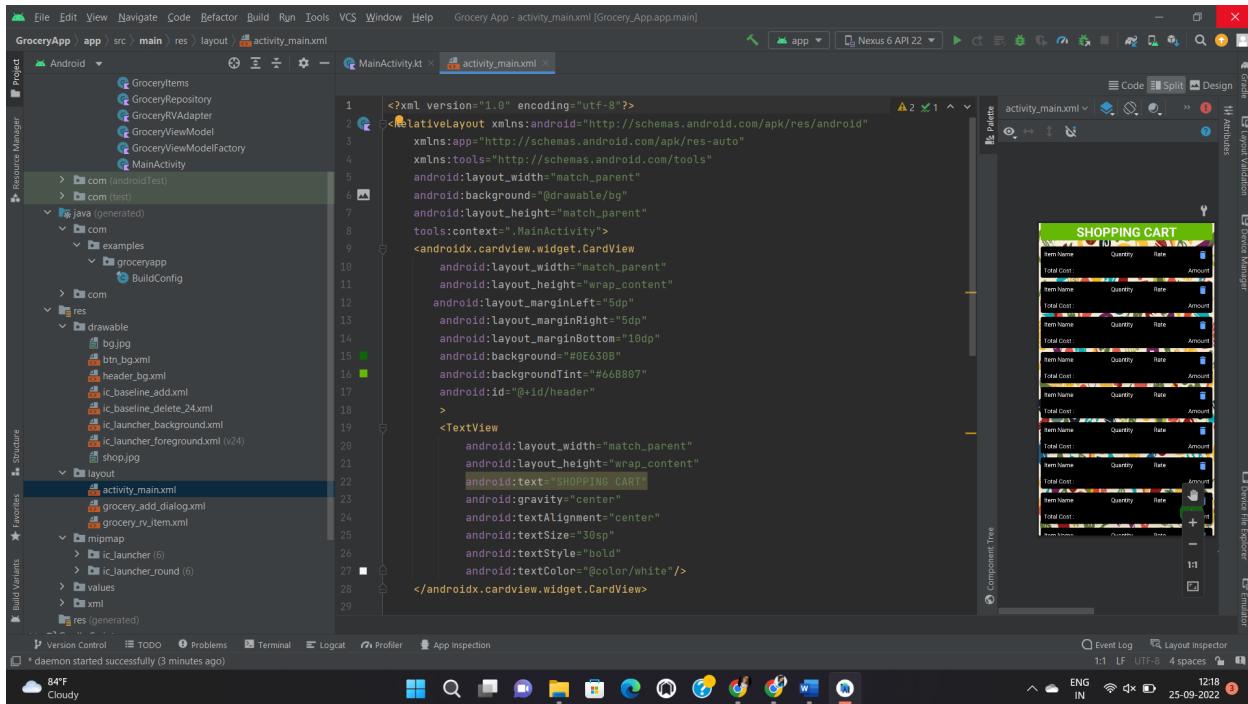
OneDrive Screenshot saved The screenshot was added to your OneDrive.

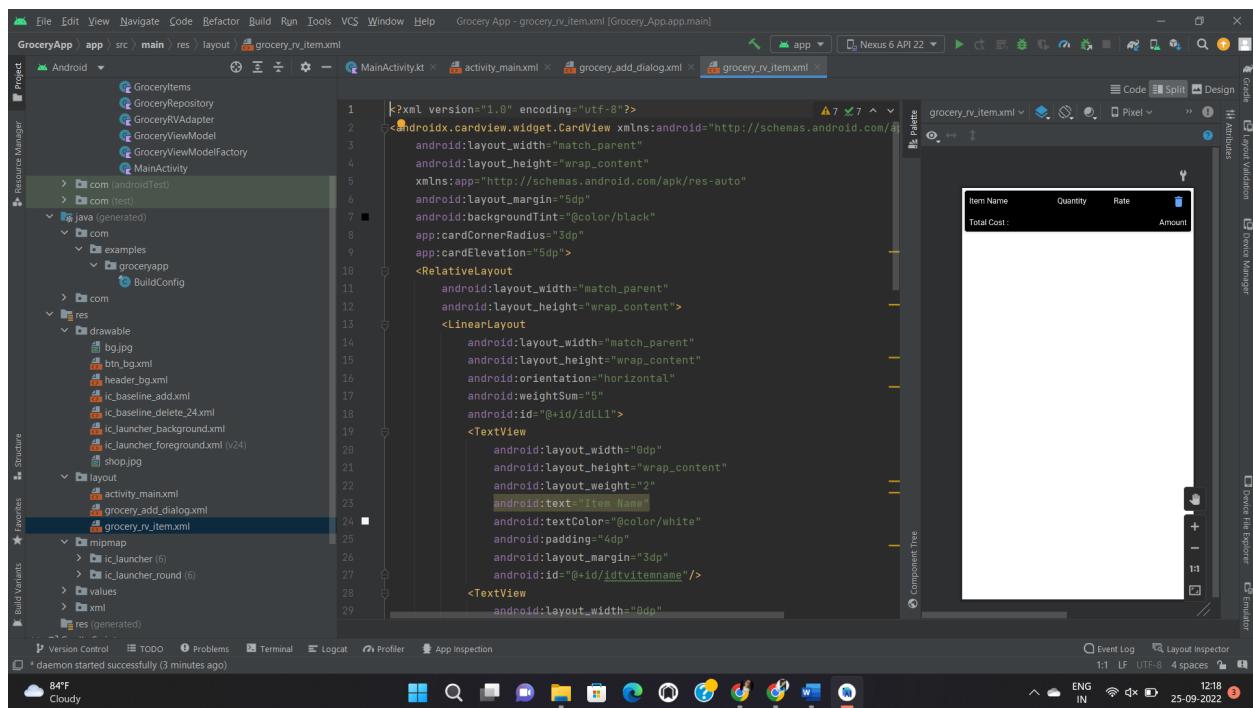
84°F Cloudy



Screenshot saved
The screenshot was added to your OneDrive.







URL's:

Google Developer's Profile:

<https://developers.google.com/profile/u/113534802479690885320?authuser=1>

GitHub Profile Link:

<https://github.com/smartinternz02/SPSGP-104620-Virtual-Internship--Android-Application-Development-Using-Kotlin>

Demo Link of project :

<https://www.youtube.com/embed/6rM00mjrzOE>

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