# Point Of Sales Android App

**DESIGNED AND DEVELOPED**

**BY**


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# ABSTRACT

In The Todays Times Most Shopkeepers Use The Manual Method Of Writing And Storing Records So To Avoid This Pos App Aims To Help Keep Track Of Recorda And Stocks In The System. Pos App Manages The Records. Here User Can Define Categories Like Food Items , Drinks And Manage It Effeciently. This also reduces the manual work and it helps us to switch to digital storage of data.

# ACKNOWLEDGMENT

I am glad to present my project **Point Of Sales Android application.** For everything I have achieved, the credit goes to all those who offered me invaluable assistance and guidance to make the project.

I take this opportunity to express my soulful gratitude management of **B. N. BANDODKAR COLLEGE OF SCIENCE** for giving this opportunity to accomplish this project work.

I am thankful to our project guide **Mr. Abhishek Vartak** for most sincere, useful & encouraging contribution throughout the project span. Without their support we couldn't complete the project on time.

I am highly obliged to the teaching members of the Computer Science who took efforts to make the project a successful endeavour. I would also like to thank non-teaching staff members.

Last, I extend my sincere thanks and appreciation to my family for supporting me a lot in finalizing this project within the limited time frame.

# DECLARATION

I here by the declare that the project entitled, "**Point OF Sales Android application**" done at **B. N. Bandodkar College of Science**, has not been in any case duplicate to submit to any other university for the award of any degree. To best of my knowledge other than me, no one has submitted to any other university.

The project is done in partial fulfillment of the requirement for the award of degree of **BACHELOR OF SCIENCE (Computer Science)** to be submitted as final semester project as part of our curriculum.

**Name and Signature of the Student**

# SYNOPSIS

## ❖ Introduction :-

The Point Of Sales Android Application is a user friendly android app that helps the user to keep track of their Products and Stocks. The app focuses on the main feature of letting the user to input their product details and stocks details and prices to calculate amount effectively. It also contains categories which are the parts of products and both catgeories and products have crud operations.

## ❖ Current System :-

Most of the shopkeepers do not even keep the track of their records and data. On the other hand, shopkeepers who keeps the track of their records notes it on paper or diary. Keeping records on paper is not a great aproach because maitaining records is not reliable. The paper can get lost, or can also be teared.

## ❖ Problems Faced in Current System :-

In the current manual work of maintaining the records on paper, there is a possibility of loss of records. Once the records are lost somehow, there isn't any way to recover the data back.

## ❖ Proposed System :-

The new proposed systems ensures flexibility and reliability. The system asks the user to create a account first that can be logged in using any other android device hence ensures flexibility. The system helps to keep the records in a proper manner so that the records can be accessed from anywhere by the user. The user would only need to login to his account using credentials such as username & password. Once the user logs into his account, he can view his products and categories data, thus ensures reliability.

## ❖ Software Requirements :-

- Operating System : Android 5 Lollipop or higher

## ❖ Hardware Requirements :-

- Memory : Minimum 1 GB RAM
- Storage : Minimum 5 MB

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# INTRODUCTION

## 1.1 Background :-

The Point OF Sales Android Application is a user friendly android app that helps the shopkeepers to keep track of their products and stocks. On the other hand, people who keeps the track of their records notes it on paper or diary. Keeping records on paper is not a great aproach because maitaining records is not reliable. The paper can get lost, or can also be teared. In the current manual work of maintaining the records on paper, there is a possibility of loss of records. Once the records are lost somehow, there isn't any way to recover the data back. The application ensures flexibility and reliability. The system asks the user to create a account first that can be logged in using any other android device hence ensures flexibility. The app helps to keep the records in a proper manner so that the records can be accessed from anywhere by the user. The user would only need to login to his account using credentials such as username & password. Once the user logs into his account, he can view his products and categories data, thus ensures reliability.

## 1.2 Feasibility Study :-

The Feasibility Study plays a major role in the analysis of the system. As the name implies, a feasibility study is used to determine the viability of an project, such as ensuring a project is technically feasible as well as economically justifiable. The system should ensure no misuse of data. Feasibility studies reflect a projects unique goals and needs.

There are various measures of feasibility that helps to decide whether a particular project is feasible or not. These measures include :-

1) **Technical Feasibility :**

This involves questions such as whether the technology needed for the system exists, how difficult it will be to build, and whether the firm has enough experience using that technology. The assessment is based on outline design of system requirements in terms of input, processes, output, fields, programs and procedures. This can be qualified in terms of volume of data, trends, frequency of updating inorder to give an introduction to the technical system. The application is the fact that it has been developed on windows XP platform and a high configuration of 1GB RAM on Intel Pentium Dual core processor. This is technically feasible .The technical feasibility assessment is focused on gaining an understanding of the present technical resources of the organization and their applicability to the expected needs of the proposed system. It is an evaluation of the hardware and software and how it meets the need of the proposed system.

**2) Operational Feasibility :**

Operational feasibility is the measure of how well a proposed system solves the problems, and takes advantage of the opportunities identified during scope definition and how it satisfies the requirements identified in the requirements analysis phase of system development.The operational feasibility assessment focuses on the degree to which the proposed development projects fits in with the existing business environment and objectives with regard to development schedule, delivery date, corporate culture and existing business processes.To ensure success, desired operational outcomes must be imparted during design and development. These include such design-dependent parameters as reliability, maintainability, supportability, usability, producibility, disposability, sustainability, affordability and others. These parameters are required to be considered at the early stages of design if desired operational behaviours are to be realised. A system design and development requires appropriate and timely application of engineering and management efforts to meet the previously mentioned parameters. A system may serve its intended purpose most effectively when its technical and operating characteristics are engineered into the design. Therefore, operational feasibility is a critical aspect of systems engineering that needs to be an integral part of the early design phases.

**3) Economical Feasibility :**

Establishing the cost-effectiveness of the proposed system i.e. if the benefits do not outweigh the costs then it is not worth going ahead. In the fast paced world today there is a great need of online social networking facilities. Thus the benefits of this project in the current scenario make it economically feasible. The purpose of the economic feasibility assessment is to determine the positive economic benefits to the organization that the proposed system will provide. It includes quantification and identification of all the benefits expected. This assessment typically involves a cost/benefits analysis.

## 1.3 Objective :-

- The main objective of the project is to simplify the task of the client.
- This system is flexible to used and reduce the need of arranging & managing an appropriate product according to the requirement of client.
- This system must store all the records of customer digitally, so it saves the time and this system is storing the records in digital manner so paper and the cost required for these papers should be save.
- The system must provide security that means only the authenticate persons can only have the access to the system.
- System must keep the records of customer, employees and keep track of the stocks.it should be able for saving, deleting and updating the records.

## 1.4 Purpose :-

The proposed system is fulfilling the requirements of Client so that the data and information can be store for longer period of time with easy access to the data and manipulation of the data. This system lead to error free, secure, reliable and fast management of the store. The application can assist to concentrate on their work rather than concentrating on the record keeping.

The purpose of this project is to provide client easy way to store data of their products and stocks, this reduces the cost spent on buying a large amount of papers and improve space utilization. The Client can maintain his records and able to access it from any android device. The system is able to control the security means that only authorized persons can have access to it. The project aims to building a digital application that would be more effective and efficient than existing manual system. This proposed system will eliminate all the manual interventions and increase the speed of whole process and will provide a well build software to monitor their expense/incomes.

## 1.5 Scope :-

The scope of project is to simplify the work of client, reduce the overall cost, access to their data easily, reduce time consumption of the client. The proposed system can be use for the various operations like if the user inputs the data incorrectly, the user can update the record. If the user wants to delete a particular record, the user would easily do that as the application is easy to use and user friendly.

This project is helpful for all shopkeepers and by using this POS application will reduce the manual entering of data in hardcopies and also there will be change in existing system.

## 1.6 Advantages :-

A client needs a software, which can facilitate store operations and make their day-to-day lives much easier. Mobile Store Management System is application software designed to take advantage of today's technology and reduce or avoid the burden of storing data on paper and in files.

Some advantages are –

- The proposed system would easily overcome most of the difficulties coming from the current system.
- Not much manual work is involved.
- The client is able to store the records digitally, no need of maintaining paper records.
- The system will help to the user to keep track of products and stocks in system.
- The system will provide the security that is only the authorised persons can access the system.
- The system will save time of the client.
- The system will provide the user friendly interface for the operations.

## 1.7 Applicability :-

Firstly When The User Opens The App He Will See A Interface Containing Login And Signup If The User Is Already Registered He Needs To Login The System. In Signup The User Details Such As Name, Username, Password And Confirm Password Will Be Asked. After Succesfully Signup User Needs To Login, In Login User Needs To Enter Username And Password In Order To Access The System.

Once Successfully Logged In System There Will Have Another Interface Containing Several Modules Such As Product , Product View, Category, Category View , Pos And Logout Button.

The User Can Add Products In Product Module And Can Edit Products In Product View By Performing Crud Operations Edit And Delete. And Category Module Contains Id And Name Of Categories And Cayegory View Contains List Of Categories Added To It And Can Perform Crud Like Edit And Delete.

The Pos Module Contains Product Id Search Bar Which Displays Product Name , Quantity And Price Which Are Editable And This Module Displays Final Amount Of Products.

## 1.8 Achievements :-

After doing this project I got to know how a project is managed and completed successfully to meet its goals. I also got a lot of new information about the software I used to develop this project. Client is presently using the project and is very satisfied. Objectives stated of projects are fulfilling the client needs. Client manage all data on this application in less amount of time.

# SURVEY OF TECHNOLOGY

## ❖ TOOLS :-

The tools that we are using for this software are as follows:

- Android Studio
- Google Firebase Database.

### ➢ ANDROID STUDIO

Android Studio is the official integrated development environment (IDE) for Google's Android operating system, built on JetBrains' IntelliJ IDEA software and designed specifically for Android development.It is available for download on Windows, macOS and Linux based operating systems or as a subscription-based service in 2020. It is a replacement for the Eclipse Android Development Tools (E-ADT) as the primary IDE for native Android application development. Android Studio was announced on May 16, 2013 It was in early access preview stage starting from version 0.1 in May 2013, then entered beta stage starting from version 0.8 which was released in June 2014. The first stable build was released in December 2014, starting from version 1.0.

### ➢ FIREBASE DATABASE

Firebase is a platform developed by Google for creating mobile and web applications. It was originally an independent company founded in 2011. In 2014, Google acquired the platform and it is now their flagship offering for app development. Firebase evolved from Envolve, a prior startup founded by James Tamplin and Andrew Lee in 2011. Envolve provided developers an API that enables the integration of online chat functionality into their websites. After releasing the chat service, Tamplin and Lee found that it was being used to pass application data that were not chat messages. Developers were using Envolve to sync application data such as game state in real time across their users. Tamplin and Lee decided to separate the chat system and the real-time architecture that powered it. They founded Firebase as a separate company in September 2011and it launched to the public in April 2012.

## ❖ TECHNOLOGY :-

Technologies that we have used in our project are as follows:

- JAVA
- FIREBASE

### ➢ JAVA

Java is a class-based, object-oriented programming language that is designed to have as few implementation dependencies as possible. It is a general-purpose programming language intended to let application developers write once, run anywhere (WORA),meaning that compiled Java code can run on all platforms that support Java without the need for recompilation.Java applications are typically compiled to bytecode that can run on any Java virtual machine (JVM) regardless of the underlying computer architecture. The syntax of Java is similar to C and C++, but has fewer low- level facilities than either of them. The Java runtime provides dynamic capabilities (such as reflection and runtime code modification) that are typically not available in traditional compiled languages. As of 2019, Java was one of the most popular programming languages in use according to GitHub,particularly for client-server web applications, with a reported 9 million developers.

### ➢ FIREBASE

Firebase is a platform developed by Google for creating mobile and web applications. It was originally an independent company founded in 2011. In 2014, Google acquired the platform and it is now their flagship offering for app development. Firebase evolved from Envolve, a prior startup founded by James Tamplin and Andrew Lee in 2011. Envolve provided developers an API that enables the integration of online chat functionality into their websites. After releasing the chat service, Tamplin and Lee found that it was being used to pass application data that were not chat messages. Developers were using Envolve to sync application data such as game state in real time across their users. Tamplin and Lee decided to separate the chat system and the real-time architecture that powered it. They founded Firebase as a separate company in September 2011 and it launched to the public in April 2012. Firebase's first product was the Firebase Realtime Database, an API that synchronizes application data across iOS, Android, and Web devices, and stores it on Firebase's cloud. The product assists software developers in building real-time, collaborative applications.

# REQUIREMENT AND ANALYSIS

## 3.1 Problem Definition :-

In the current manual work of maintaining the records on paper, there is a possibility of loss of records. Once the records are lost somehow, there isn't any way to recover the data back.

## 3.2 Requirement Specification :-

Firstly When The User Opens The App He Will See A Interface Containing Login And Signup If The User Is Already Registered He Needs To Login The System. In Signup The User Details Such As Name, Username, Password And Confirm Password Will Be Asked. After Succesfully Signup User Needs To Login, In Login User Needs To Enter Username And Password In Order To Access The System. Also the login and signup fields are validated before accepting user input in it.

Once Successfully Logged In System There Will Have Another Interface Containing Several Modules Such As Product , Product View, Category, Category View , Pos And Logout Button.

The User Can Add Products In Product Module And Can Edit Products In Product View By Performing Crud Operations Edit And Delete. And Category Module Contains Id And Name Of Categories And Cayegory View Contains List Of Categories Added To It And Can Perform Crud Like Edit And Delete.

The Pos Module Contains Product Id Search Bar Which Displays Product Name , Quantity And Price Which Are Editable And This Module Displays Final Amount Of Products.

For making this application we are using following software and tools :-

- Android Studio Software
- Firebase Database
- Java Programming Language

## 3.3 Planning and Scheduling :-

### 3.3.1 Life Cycle Of Project :-

Software Development Life Cycle (SDLC) is a process used to design, develop and test high quality softwares. The SDLC aims to produce a high-quality software that meets or exceeds customer expectations, reaches completion within times and cost estimates.

For development of the Proposed system the model using is the WATERFALL MODEL.

- **Waterfall Model :-**

The waterfall model is a project management methodology based on a sequential design process in which progress is seen as flowing steadily downwards (like a waterfall) through the different phases.

This model is simple and easy to understand and use. It is easy to manage due to the rigidity of the model. Each phase has specific deliverables and a review process. In this model phases are processed and completed one at a time.

- **The Phases of Waterfall Model :-**

**1) Requirement definition :-**

For the development of the proposed system the requirements of the client are:

1. Client want to keep tracks of products and its details and its prices.

2. Client is needed a flexible application that can be accessed from any android device.

**System and Software Design :-**

This phase allocates the requirement to either hardware or software system by establishing an overall system architecture.

For designing the system we required Android Studio software for developing the front-end and the Firebase Cloud Database as a back-end of our system.

And as a part of software design there will be Modules in the system like

1. Login and Signup Module
2. Dashboard
3. Product Module
4. Product view module
5. Category module
6. Category view module
7. Pos module
8. Logout

**2) Implementation and Unit Testing :-**

During this phase the software design realized as a set of programs or program unit.

Unit testing involves verifying that each unit need its specifications.

**3) Integration and system testing :-**

In this phase the individuals program units are integrated and tested as a complete system to ensure that the system requirements meets to its specifications.

After this phase the system is delivered to the client.

**4) Operation and Maintenance :-**

This is the longest phase of SDLC.

The application is installed on client android phone and put into the practical use.

Maintenance involves correcting the errors and providing the better application to the client.

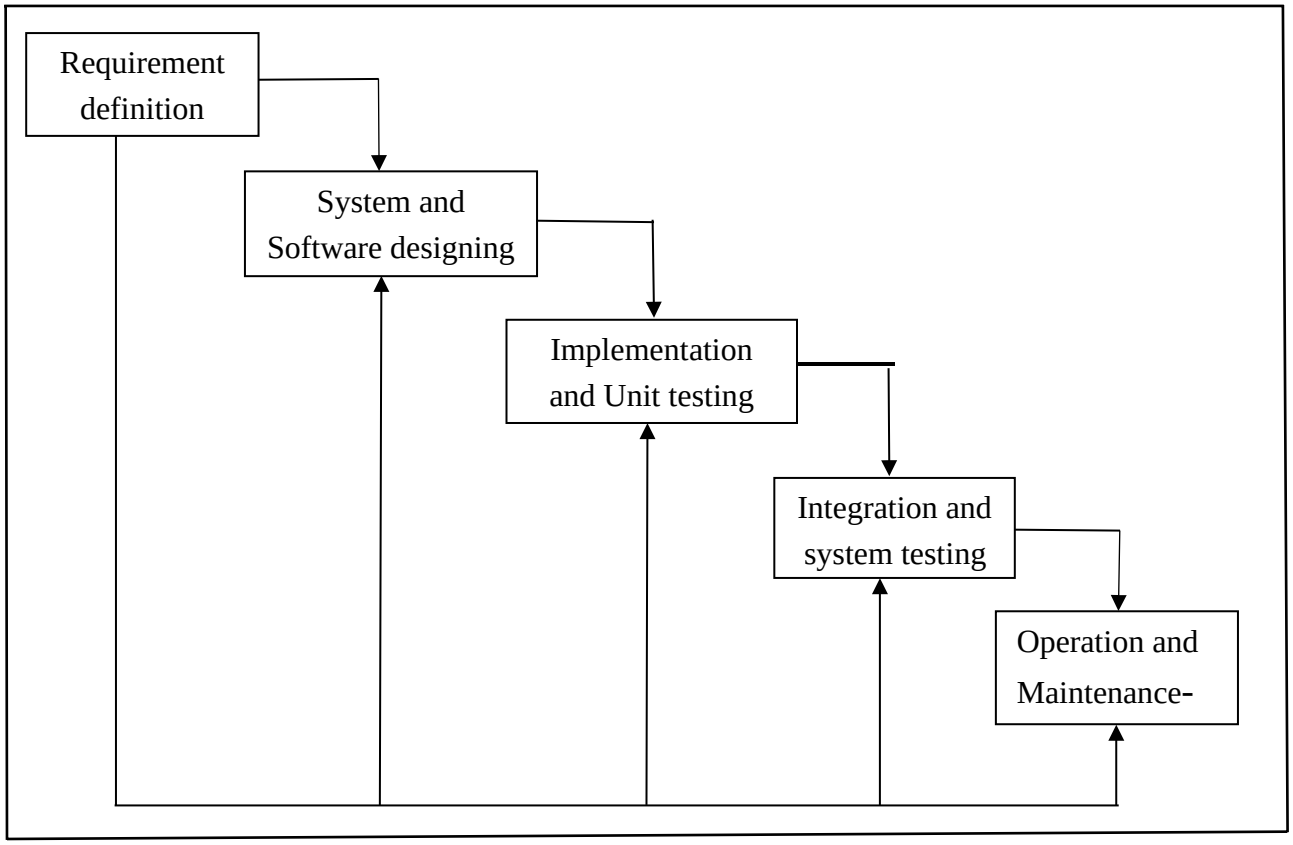



**Fig 3.1 Waterfall model**

### 3.3.2 Gantt Chart :-

A Gantt chart is a horizontal bar chart developed as a production control tool. **Gantt charts** are useful for planning and scheduling projects. They help you assess how long a project should take, determine the resources needed, and plan the order in which you'll complete tasks. They are also helpful for managing the dependencies between tasks. A Gantt chart is constructed with a horizontal axis representing the total time span of the project, broken down into increments (for example, days, weeks, or months) and a vertical axis representing the tasks that make up the project

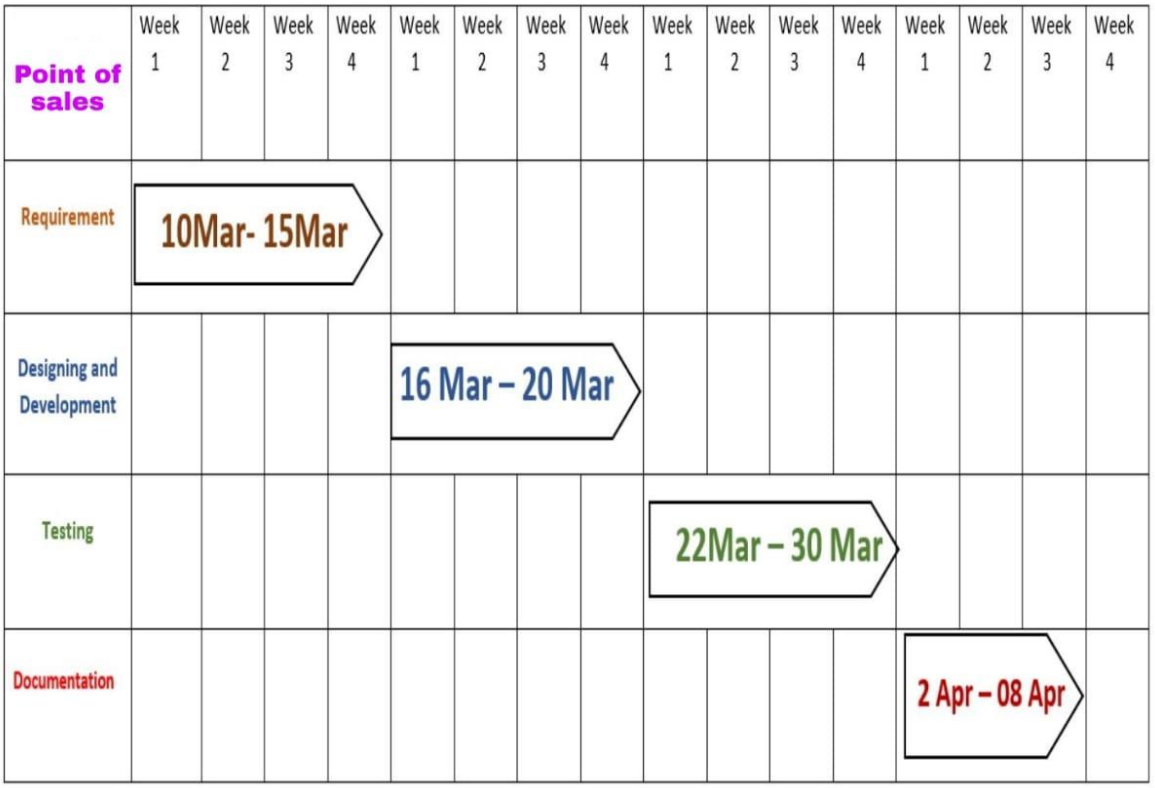



**Fig 3.2 Gantt chart**

## 3.4 Software and Hardware Requirement :-

- Software Requirements :-
  - Operating System : Microsoft Windows 7 and higher
  - Front-end : Android Studio
  - Back-end: Firebase Cloud Database

- Hardware Requirements :-
  - Memory : Minimum 4 GB RAM
  - Hard disk : Minimum 1 GB
  - Processor : Minimum 32-bit processor

## 3.5 Event Table :-

| Sr. No. | Event | Trigger | Source | Activity | Response | Destination |
|---|---|---|---|---|---|---|
| 1 | SIGN UP | CREATES ACCOUNT | User | Asks to put name , username and password | Opens account if successful | DashBoard |
| 2 | LOGIN | LOGINS ACCOUNT | User | Asks to input username & password | Login successful | dashboard |
| 3 | PRODUCT ADD | ADDS PRODUCT | User | Adding new product details | Product successfully added | Product screen |
| 4 | PRODUCT EDIT | UPDATES PRODUCT | User | Updating Product details | Product successfully edited | Product screen |
| 5 | PRODUCT DELETE | DELETES PRODUCT | User | Deleting product details | Product successfully deleted | Product screen |
| 6 | CATEGORY ADD | ADDS CATEGORY | User | Adding category details | Category successfully added | Category screen |
| 7 | CATEGORY EDIT | EDITS CATEGORY | User | Updating category details | Category successfully edited | Category screen |
| 8 | CATEGORY DELETE | DELETES CATEGORY | User | Deleting category details | Category successfully deleted | Category screen |
| 9 | POS SEARCH | SEARCH ID | User | Searching product id | Search product id | Pos screen |
| 10 | LOGOUT | LOGOUT | User | Logging out | Logged out successfully | Login page |

# SYSTEM DESIGN

## 4.1 Basic Module :-

The system has modules as follows :

1. Login module –
   The login module consist of 2 major fields such as username and password. IN the username part the user needs to enter his username and same for password. The login module has validation testing so that entering the correct username and password will login the system. Incorrect username or password will deny the access to the system.

2. Sign Up module –
   The signup module contains 4 major fields such as name , username, password and confirm password. The name field is the user real name which this account will belong to him/her. Then the user need to enter password and confirm his password to signup successfully.

3. Product Module –
   The Product Module Consist Of 4 Fields And A Category Selection With A ( Add Product Button ) .
   These 4 Fields Are Namely Product Id , Product Name , Quantity , Price. The Product Id Is The Serial No Of Product To Be Mentioned In The Field. The Product Name Field Describes The Respective Product Name. The Quantity Field Is The Amount Of Products To Be Mentioned. The Price Field Describes The Actual Cost Of The Product. The Category Selection Pane Is The List Of Categories Which Are Available After Creating A Category In Category Module. These Categories Can Be Varied According To Examples And Can Be Related To Food Items Brand (Brand Xyz) . It Contains "Add Product" Button Which Adds These Products To Product View Module.

4. Product View Module –
   The Product View Module Shows The List Of Products Which Have Added To This Module Which Had Been Created In Product Module. This Product View Module Describes Edit And Delete Operation. When Clicked On A Product It Shows The Product Id , Product Name, Quantity , Price , And Category And 2 Buttons Edit & Delete . If We Have To Edit The Product Information We Will Just Edit It By Changing Inside Content And We Will Press The Edit Button Which Then Updates The Edited Content Of Product.
   The Delete Button Will Simply Delete The Product From Product View.

5. Category Module –
   The Category Module Consist Of 2 Fields And A Button. The 2 Fields Are Namely Category Id And Category Name & A Button Called ("Add Category") . In Category Id We Have To Enter Serial No Of Category. In Category Name Field We Have To Enter The Category Name I.E Brand Name Of Food Items . The Add Category Button Adds The Category To Category View Module.

6. Category View Module –
   The Category View Module Shows The List Of CATEGORIES Which Have Added To This Module . This Category View Module Describes Edit And Delete Operation. When Clicked On A Product It Shows The Category Id And Category Name And 2 Buttons Edit & Delete . If We Have To Edit The CATEGORY Information We Will Just Edit It By Changing Content And We Will

Press The Edit Button Which Will Get Updated To The Category Module .
The Delete Button Will Simply Delete The Category From Product View.

7. POS Module –

The Pos View Module Is The Main Inventory Module Which Contains 4 Major Fields And 1 Product Id Search Button And A Total Button.
The 4 Major Fields Are Product Id, Product Name, Quantity And Price. The Function Of This Pos Module Is To Calculate The Final Amount By Simply Searching The Proudct Id . When The Product Id Is Searched The Respective Details Such As Its Name , Quantity And Price Are Displayed And These Fields Are Editable That Means We Can Edit The Final Quantity And Price To Show Final Total.

## 4.2 Logic Diagrams :-

A logical diagram provides a graphical view of the structure of an information system, and helps you analyse the structure of your data system through entities and relationships, in which primary identifiers migrate along one-to-many relationships to become foreign identifiers, and many-to-many relationships can be replaced by intermediate entities. Logical diagram is used to ensure the client understands the proposed system.

### 4.2.1 ER diagram :-

The ER or (Entity Relational Model) is a high-level conceptual data model diagram. Entity-Relation model is based on the notion of real-world entities and the relationship between them. Following diagram represent the Expense Tracker Application have the entities like User,Expense,income,logout,statistics. It has the attributes. The User has the attributes like Sign up, Login etc.Expense has the attribute like Amount,type & note.Income has the attribiute like amount,type and note.Statistics has the attribute like Income data and Expense Data. Logout has the attribute like End.

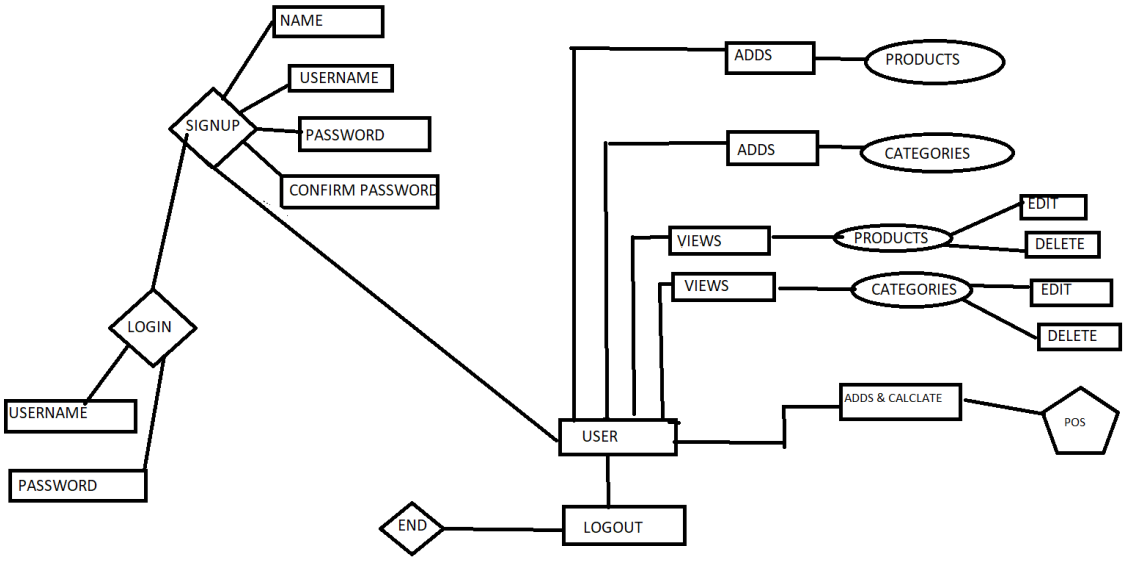



**Fig 4.2 ER diagram**

## 4.2.2 Use case diagram :-

A use case diagram at its simplest is a representation of user's interaction with the system that shows the relationship between the user and the different use cases in which the user is involved. A use case diagram can identify the different types of users of a system and the different use cases and will often be accompanied by the other types of diagrams as well. The actors(end-users) involved in the use cases, a use case diagram and the detail use case description are provided. The use cases that find representation are User. The user can add, update, delete details of his income and expenses etc.

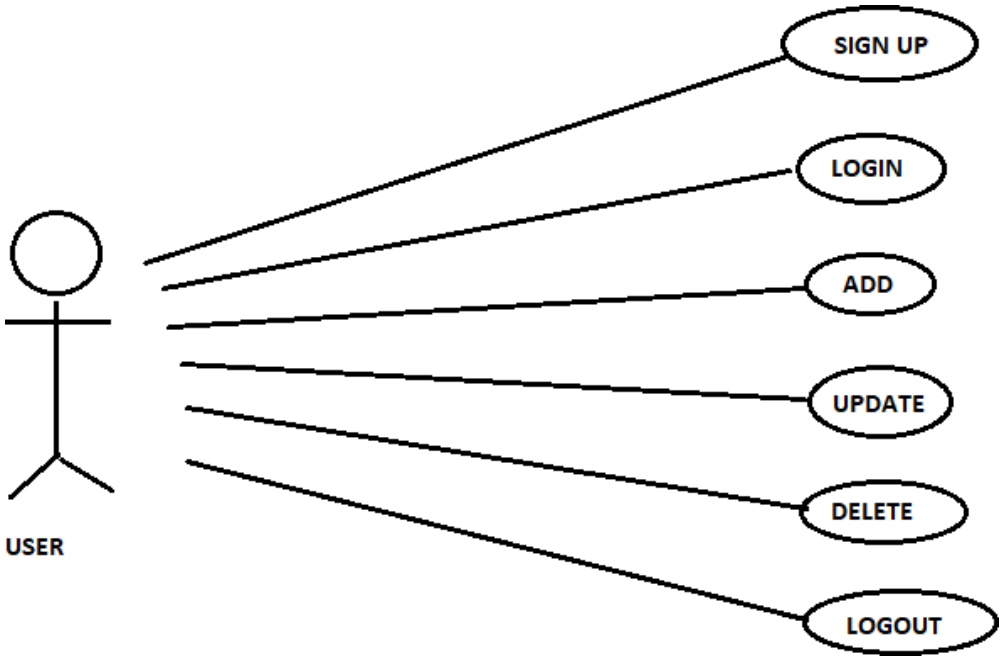



**Fig 4.3 Use case diagram**

### 4.2.3 Activity diagram :-

Activity diagram is another important diagram in UML to describe the dynamic aspects of the system. Activity diagram is basically a flowchart to represent the flow from one activity to another activity. The activity can be described as an operation of the system. The control flow is drawn from one operation to another. Activities model can be sequential and concurrent. In both cases an activity diagram will have a beginning & an end. In between there are ways to depict activities, flows, decisions, guards, merge and time events and more.

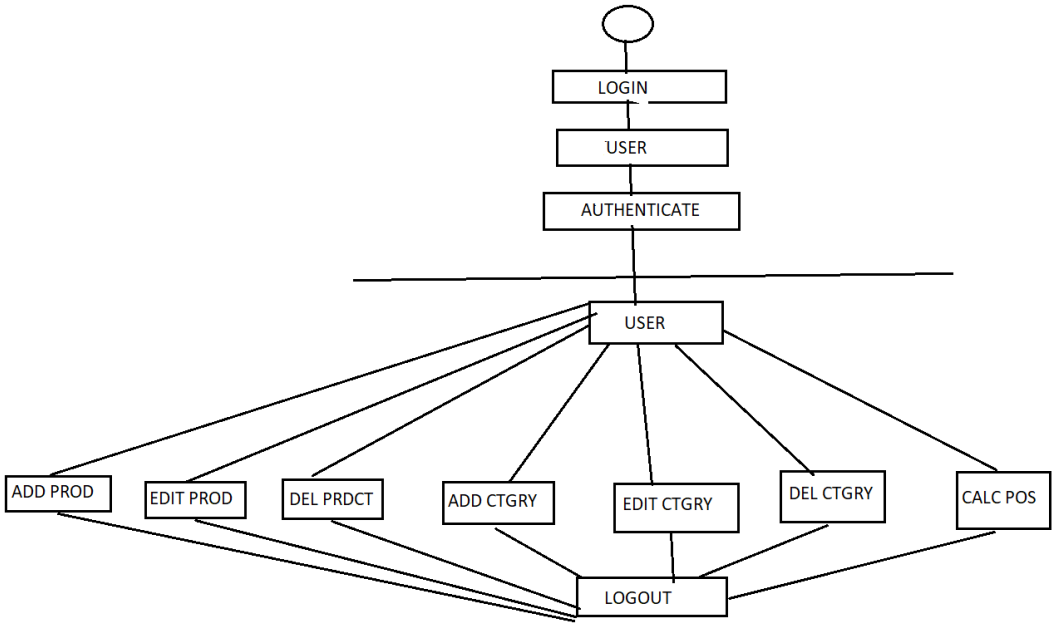



**Fig 4.4 Activity diagram.**

## 4.3 Test Case Design :-

| Sr. no. | Action | Input | Expected output | Actual Output | Test result | Test comment |
|---|---|---|---|---|---|---|
| 1. | Aplication Launch | Click on App icon | Login page | Login page | Pass | Successful |
| 2. | Enter correct username and password | Username : RAJU Password: **** | Main Dashboard | Dashboard page | Pass | Dashboard page will display |
| 3. | If username and password are incorrect | Username: RAJU1 Password: ***** | “error: username or password is incorrect” | “error: username or password is incorrect” | Fail | Invalid username and password |
| 4. | If username and password are not entered | Username & password – blank fields | “error: empty fields” | “error: empty fields” | Fail | Unsuccessful |
| 5. | If signup is not entered | Name , username and password – blank fields | “error: some fields are empty” | “error: some fields are empty” | Fail | Unsuccessful |
| 6. | If signup username and password entered | Username & password | “dashboard” | “dashboard” | Pass | Successful |

# IMPLEMENTATION AND TESTING

## 5.1 Testing Approach :-

Software Testing is an investigation conducted to provide stakeholders with information about the quality of the product or service under test. It can also provide an objective, independent view of the software to allow the business to appreciate and understand the risk of software implementation. The basic purpose of testing is to detect the errors that may be present in the program. Testing as the process of executing a program with the intent of finding errors.

### 5.1.1 The Box Approach :-

Software testing methods are traditionally divided into white-box and black-box testing. These two approaches are used to describe the point of view that a test engineer takes when designing test cases.

1) **White-box Testing :-**

White box testing also known as clear testing, glass testing, and transparent box testing and structural testing. In white box testing an internal perspective of the system, as well as programming skills, are used to design test case. The testers choose inputs to exercise paths through the code and determine the appropriate outputs. While white-box testing can be applied at the unit, integration and system levels of the software testing process, it usually done at the unit level.

2) **Black-box Testing :-**

Black box testing treats the software as a “black box”, examining functionally without any knowledge of internal implementation, without seeing the source code. The testers are only aware of what the software is supposed to do, not how it does it. Black box Testing methods include : equivalence portioning, boundary value analysis, all-pairs testing state transition tables, decision table testing, fuzz testing , model –based testing, use-case testing, exploratory testing and specification-based testing.

### 5.1.2 Levels of Testing :-

The levels of testing are as follows :

1) Unit Testing
2) Integration Testing
3) System Testing

1. **Unit Testing :-**

   Unit testing focuses verification efforts on the smallest unit of the software design, the module. This is also known as "Module Design". This testing carried out during programming stage itself. In this testing each module is found to be working satisfactorily as regard to the expected output from the module. All textboxes are having validation by which they will not remain empty and all work properly as expected. To keep a password then the user needs to add minimum of 1 lowercase and 1 uppercase.

2. **Integration Testing :-**

   Integration testing is systematic testing for construction the program structure while at the same time conducting tests to uncover errors associated with in the interface. The objective is to take unit tested modules and build a program structure. All the modules are combined and tested as a whole. Here correction is difficult because the isolation of cause is complicated by the vast expense of the entire program. In Integration testing I test on application by combining all modules. All the user data including his expense and income amount show togetherly smoothly.

3. **System Testing :-**

   It is the stage of implementation that is aimed at ensuring that the system works accurately and efficiently for live operation commences. Testing is vital to the success of the system. System testing makes a logical assumption that if all the parts of the system are correct, then goal will be successfully achieved.

## 5.2 Coding Detail and code efficiency :-

- Fields such as Amount are validated and does not take invalid values.
- Each form for User registration, Login page does not take blank input field.
- Avoiding errors in data.
- Integration of all the modules/forms in the system.
- Preparation of the test cases.
- Preparation of the possible test data with all the validation checks.
- Actual testing done manually.

- Functionality of the entire module/forms.
- Validations for user input.
- Checking of the Coding standards to be maintained during coding.
- Testing the module with all the possible test data.
- Testing of the functionality involving all type of calculations etc.

### 5.2.1 Code for MainActivity.java :-

```
package com.pos.project;

import androidx.appcompat.app.AppCompatActivity;
import androidx.cardview.widget.CardView;

import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
   private Intent intent;

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      String name = getIntent().getStringExtra("name");
      getSupportActionBar().setTitle("User : "+name);
   }

   public void displayProduct(View view) {
      intent = new Intent(this,Product.class);
      startActivity(intent);
   }

   public void displayProductList(View view) {
      intent = new Intent(this,ProductView.class);
      startActivity(intent);
   }

   public void displayCategory(View view) {
      intent = new Intent(this,Category.class);
      startActivity(intent);
   }

   public void displayCategoryList(View view) {
      intent = new Intent(this,CategoryView.class);
      startActivity(intent);
   }

   public void displayPos(View view) {
      intent = new Intent(this,Pos.class);
      startActivity(intent);
   }

   public void logout(View view) {
      finish();
   }
     }
```

### 5.2.2 Code for POS.java :-

```
package com.pos.project;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.text.Editable;
import android.text.TextWatcher;
import android.util.Log;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Spinner;
import android.widget.TextView;
import android.widget.Toast;

import com.google.android.gms.tasks.OnCompleteListener;
import com.google.android.gms.tasks.Task;
import com.google.firebase.firestore.FirebaseFirestore;
import com.google.firebase.firestore.QueryDocumentSnapshot;
import com.google.firebase.firestore.QuerySnapshot;

import static java.lang.Integer.parseInt;

public class Pos extends AppCompatActivity {
    EditText productIdText;
    EditText productNameText;
    EditText productPriceText;
    EditText productQuantityText;
    TextView totalText;
    Button searchBtn;
    String productPrice;
```

```
FirebaseFirestore db = FirebaseFirestore.getInstance();


@Override
protected void onCreate(Bundle savedInstanceState) {
   super.onCreate(savedInstanceState);
   setContentView(R.layout.activity_pos);
   productIdText = findViewById(R.id.pos_product_id_edit_text);
   productNameText = findViewById(R.id.pos_product_name_text);
   productPriceText = findViewById(R.id.pos_product_price_text);
   productQuantityText = findViewById(R.id.pos_product_quantity_text);
   totalText = findViewById(R.id.pos_product_total_text);
   searchBtn = findViewById(R.id.search_button);


   searchBtn.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
         searchProduct();
      }
   });


   productQuantityText.addTextChangedListener(new TextWatcher() {
      public void afterTextChanged(Editable s) {
         if(!productQuantityText.getText().toString().equals("") && productPrice != null){
            int total = parseInt(productQuantityText.getText().toString()) *
  (int)Double.parseDouble(productPrice);
            totalText.setText("Total : "+ total);
         }else{
            totalText.setText("Total : ");
         }
      }


      public void beforeTextChanged(CharSequence s, int start, int count, int after) {}
```

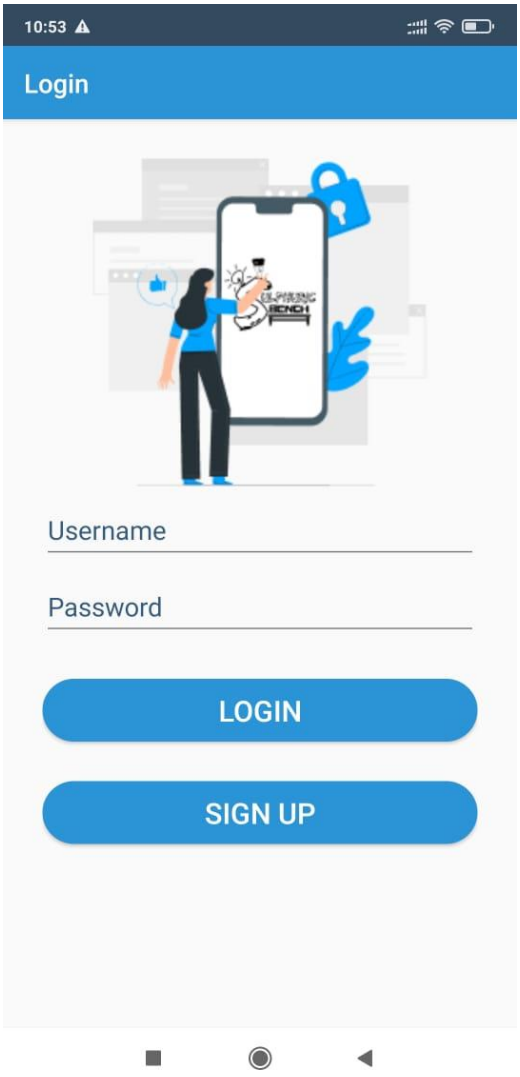
```
        public void onTextChanged(CharSequence s, int start, int before, int count) {}
    });
}

public void searchProduct(){
    db.collection("products")
            .whereEqualTo("productId", productIdText.getText().toString())
            .get()
            .addOnCompleteListener(new OnCompleteListener<QuerySnapshot>() {
                @Override
                public void onComplete(@NonNull Task<QuerySnapshot> task) {
                    if (task.isSuccessful()) {
                        int count = 0;
                        for (QueryDocumentSnapshot document : task.getResult()) {
                            productPrice = document.getData().get("productPrice").toString();
                            productNameText.setText(document.getData().get("productName").toString());
                            productPriceText.setText(String.valueOf((int)Double.parseDouble(productPrice)));
                            count = count+1;
                        }
                        if(count<1){
                            Toast.makeText(Pos.this, "Error: Couldn't find product!", Toast.LENGTH_SHORT).show();
                            productNameText.setText("");
                            productPriceText.setText("");
                            totalText.setText("");
                            productNameText.setText("");
                        }
                    } else {
                        Toast.makeText(Pos.this, "Error: Couldn't find product!", Toast.LENGTH_SHORT).show();
                        productNameText.setText("");
                        productPriceText.setText("");
                        totalText.setText("");
                        productNameText.setText("");
```

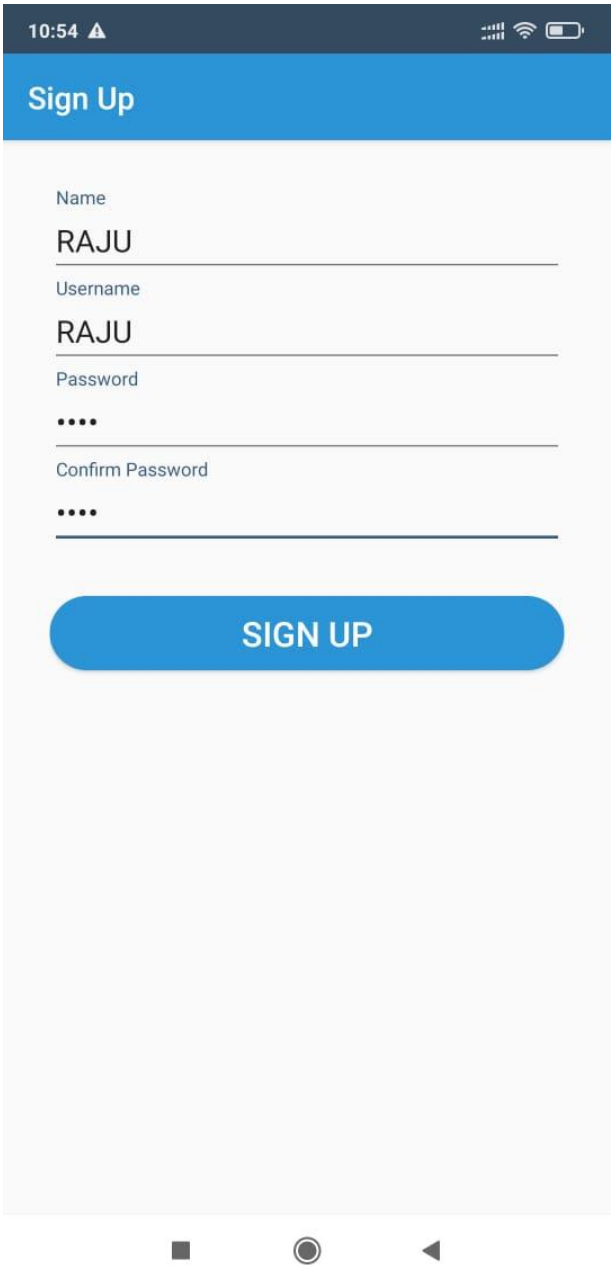
```
            }
          }
        });
    }
  }
```

# RESULTS

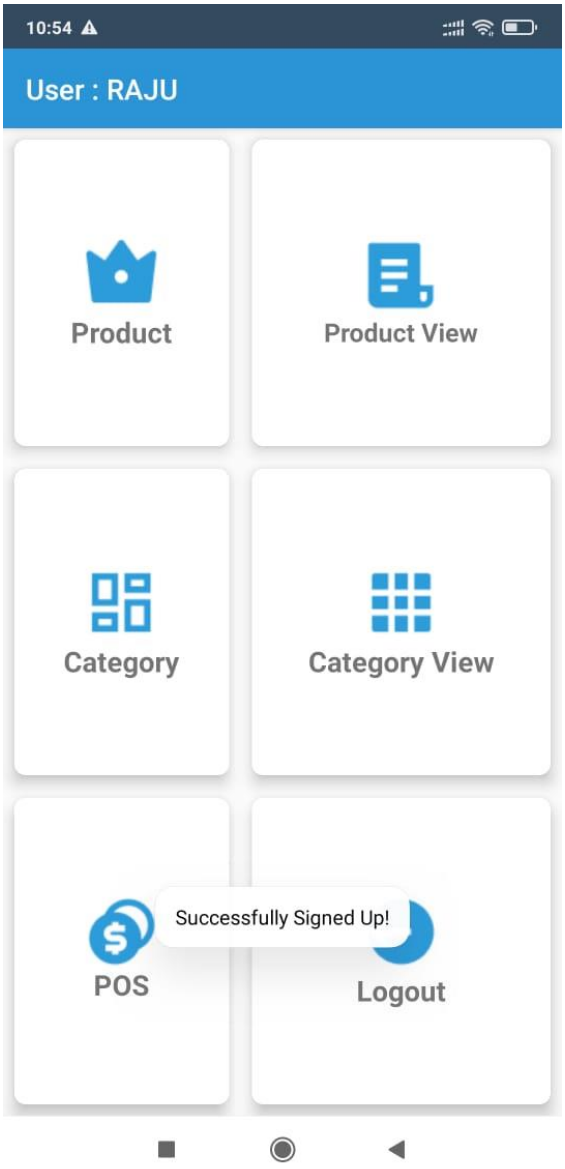
MAIN SCREEN WHEN APPLICATION IS LAUNCHED:-



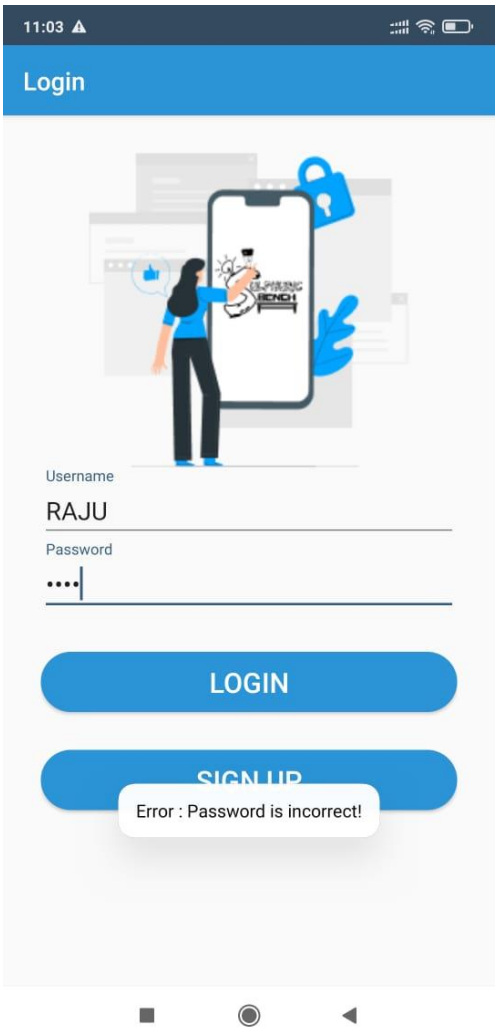
SIGNUP SCREEN:-



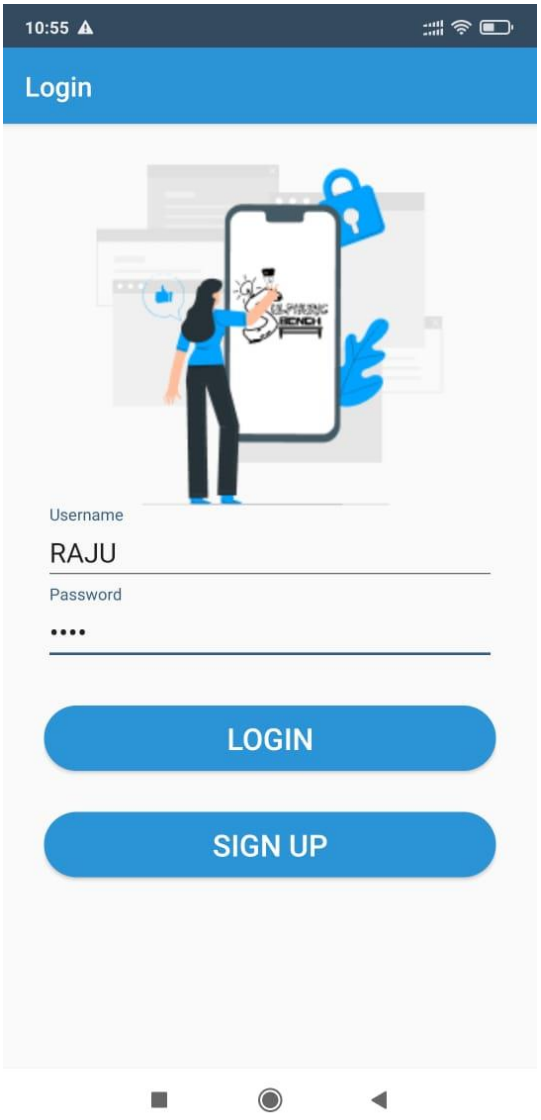
SIGNUP TOAST :-



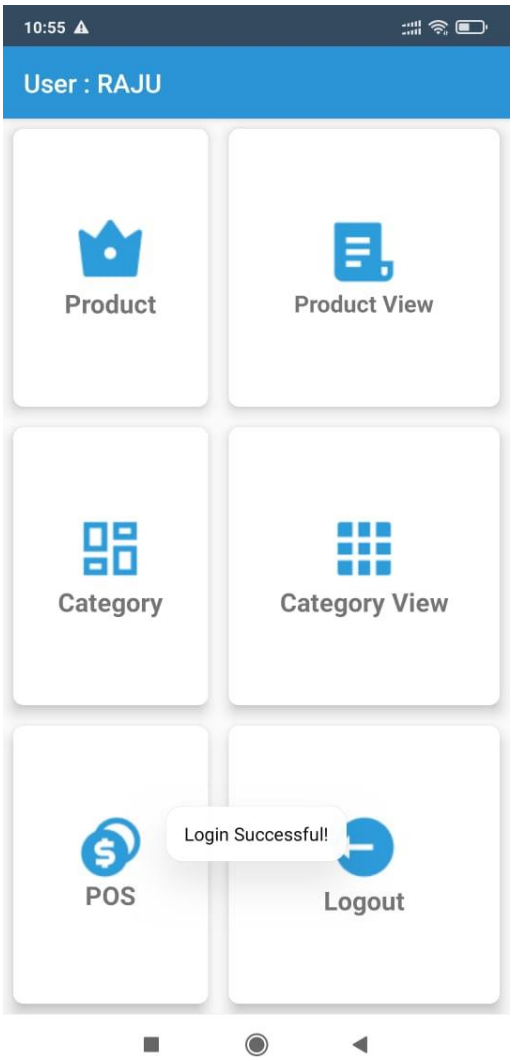
SIGNUP VALIDATION :-



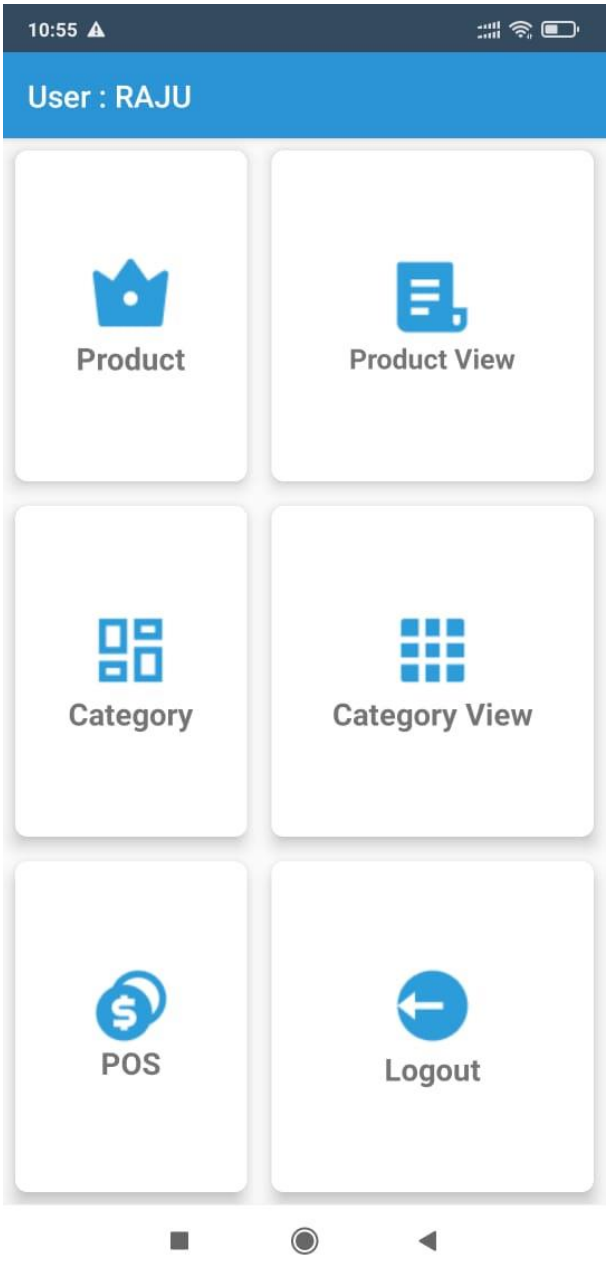
LOGIN :-



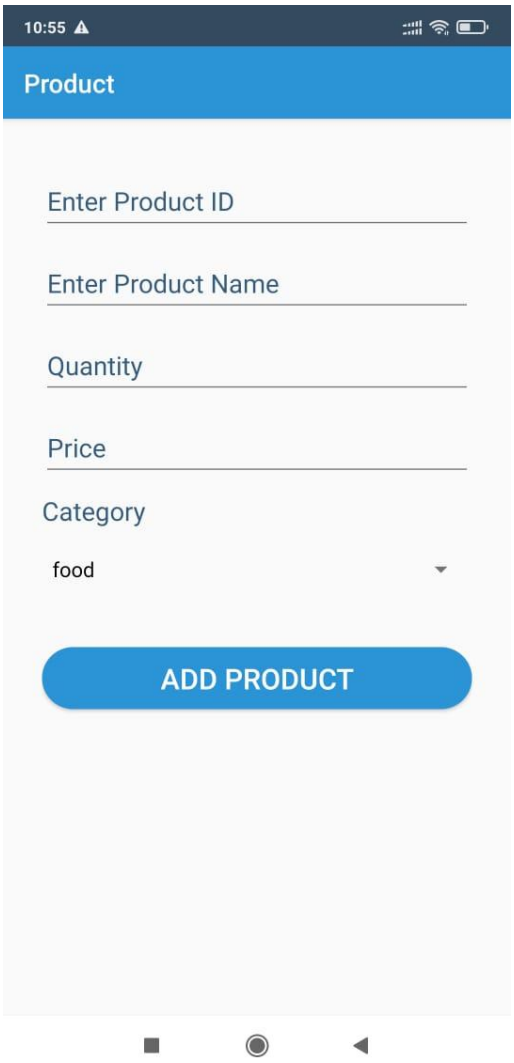
LOGIN TOAST :-


10:55
User : RAJU
Product
Product View
Category
Category View
POS
Login Successful!
Logout

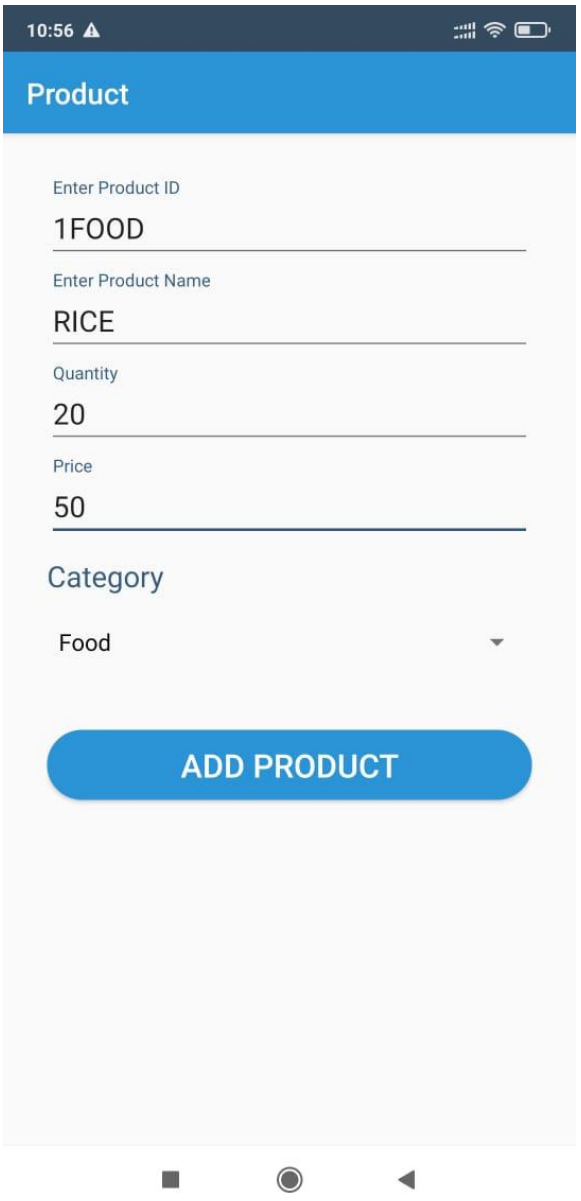
MAIN DASHBOARD :-



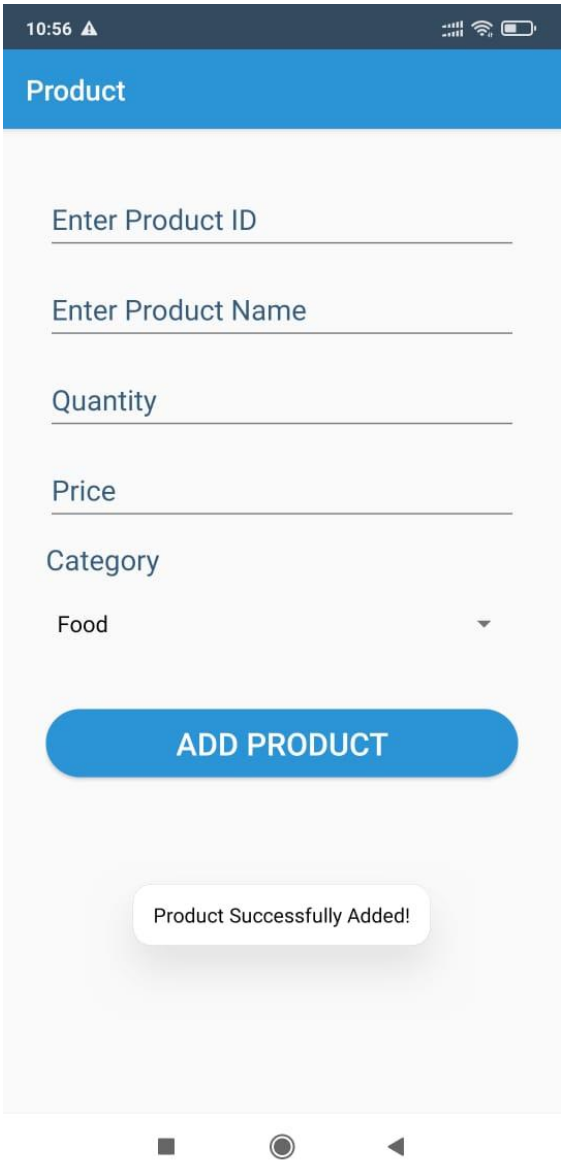
PRODUCT MODULE :-



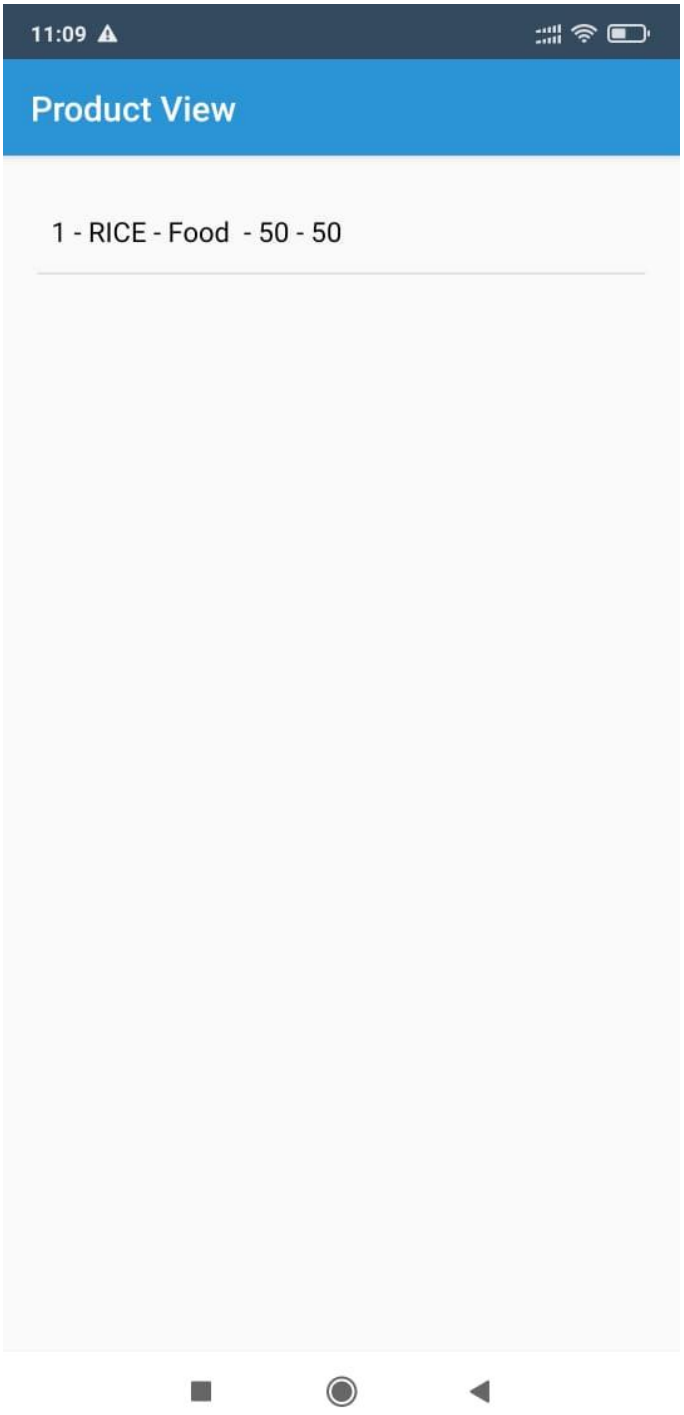
ENTER PRODUCT DETAILS :-



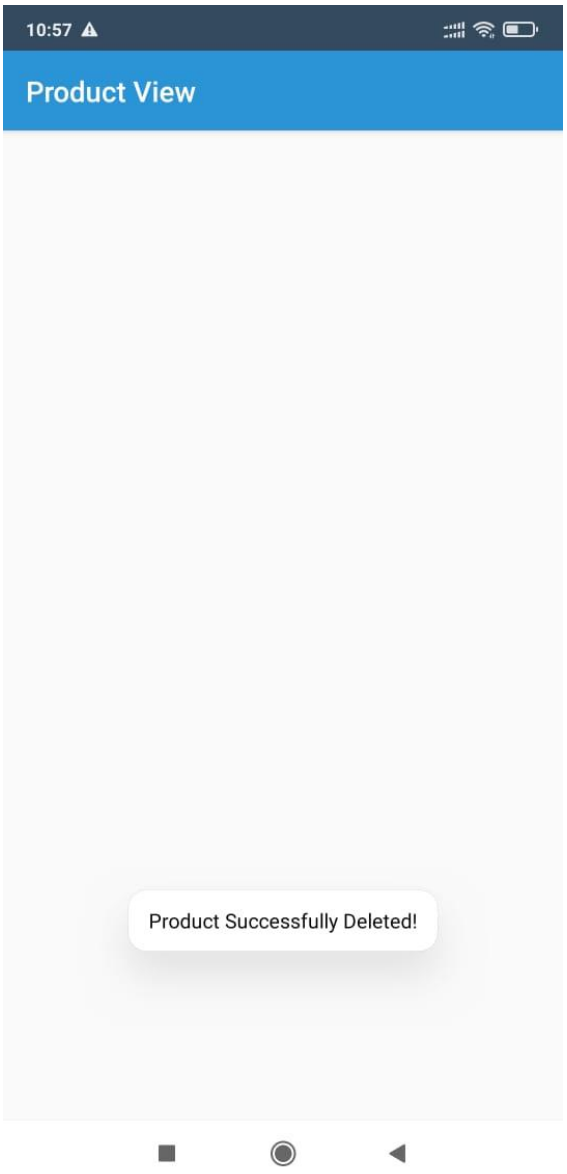
PRODUCT ADDED TOAST :-



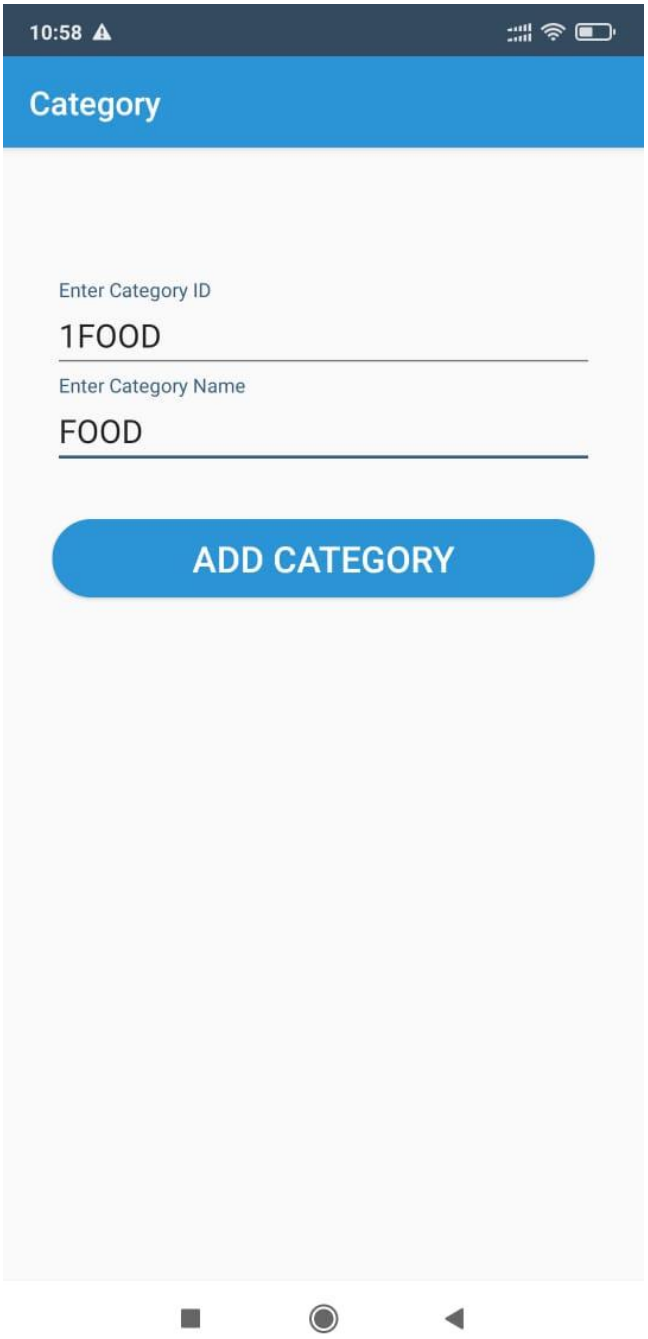
PRODUCT VIEW SCREEN :-



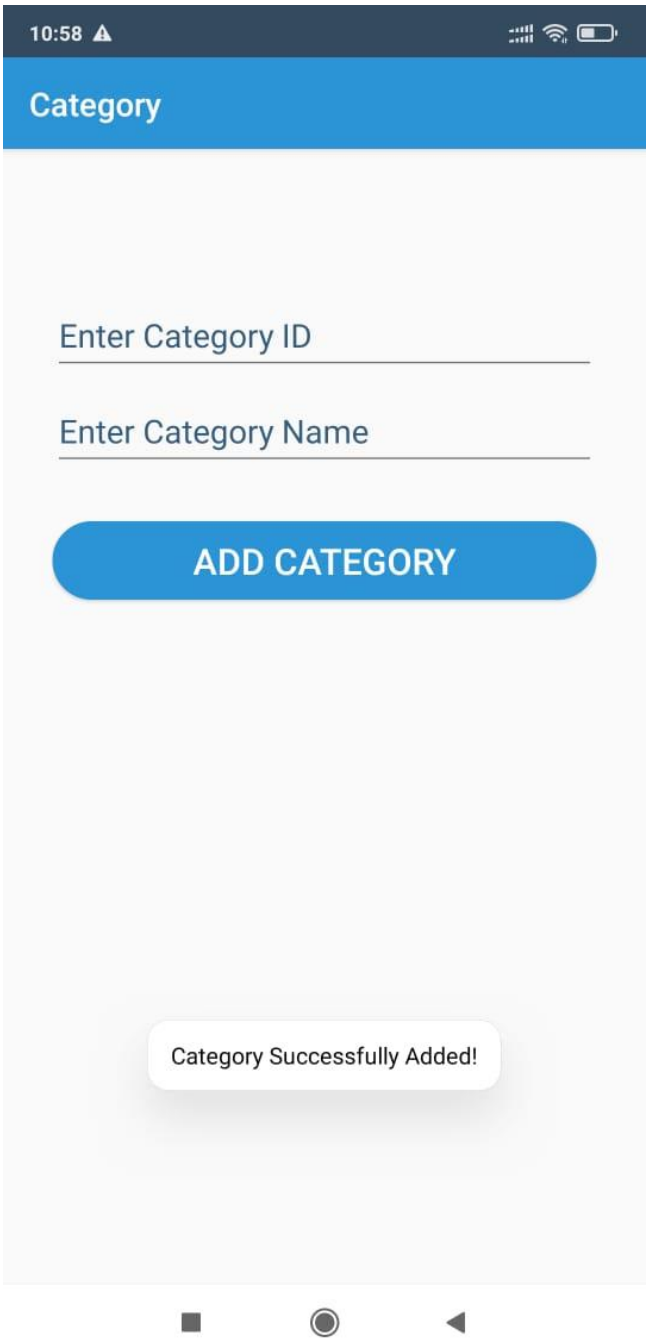
PRODUCT EDIT & DELETE :-



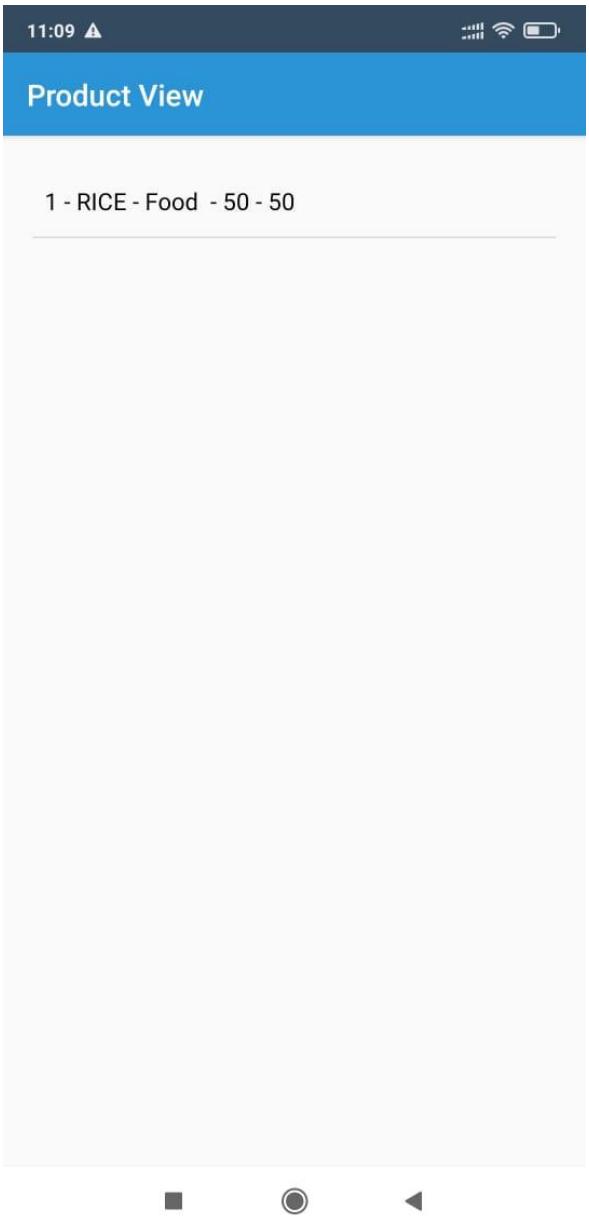
CATEGORY MODULE :-



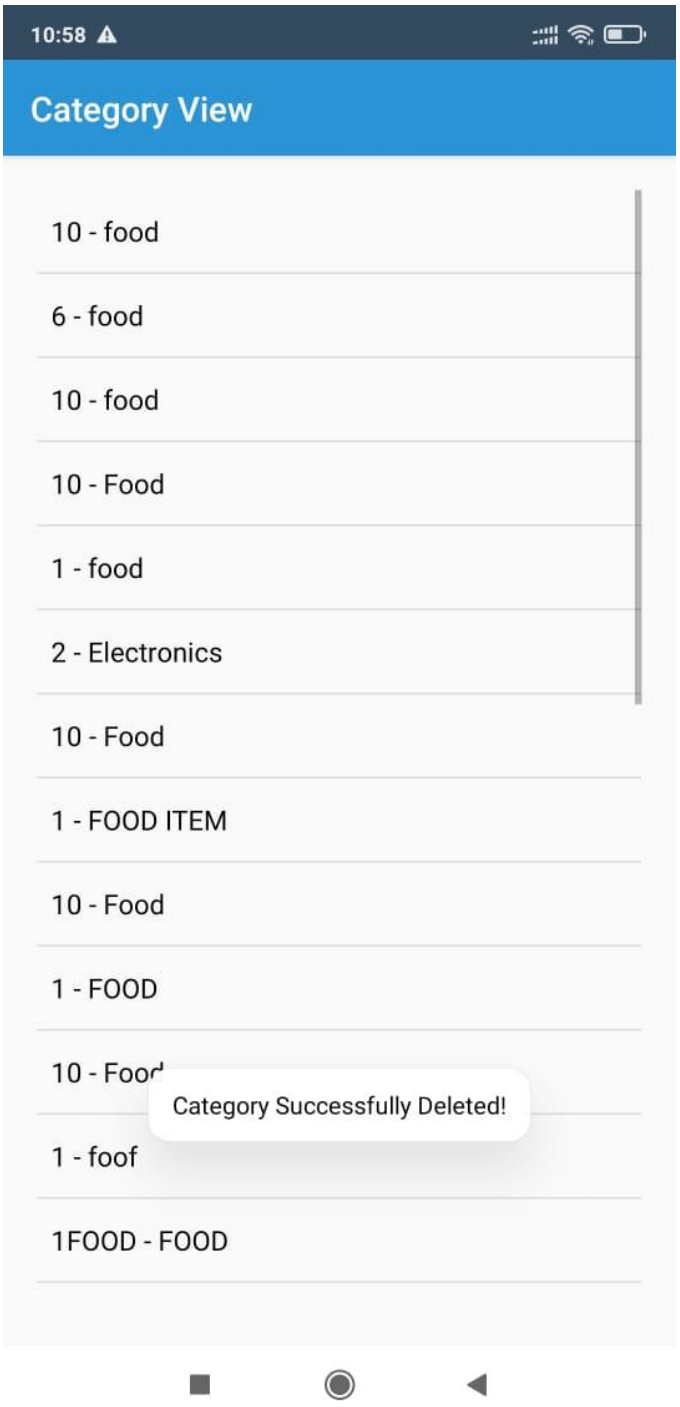
CATEGORY ADDED TOAST :-



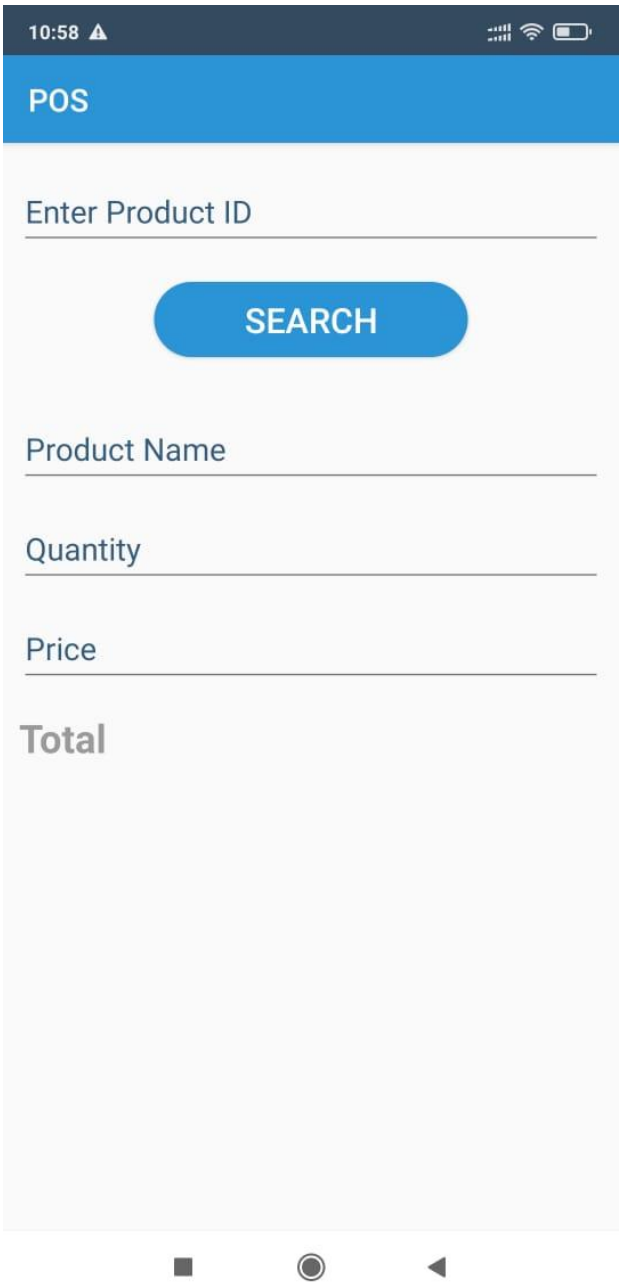
CATEGORY VIEW MODULE :-



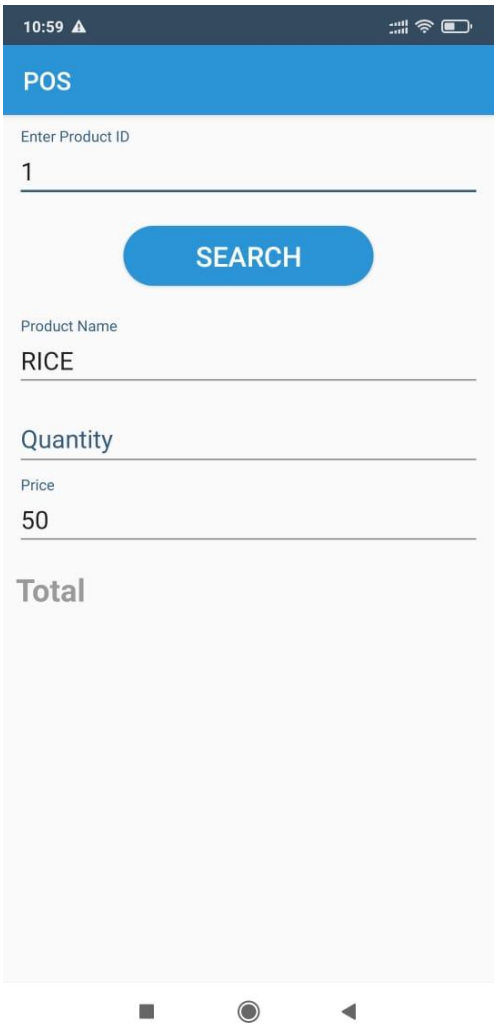
CATEGORY EDIT & DELETE :-



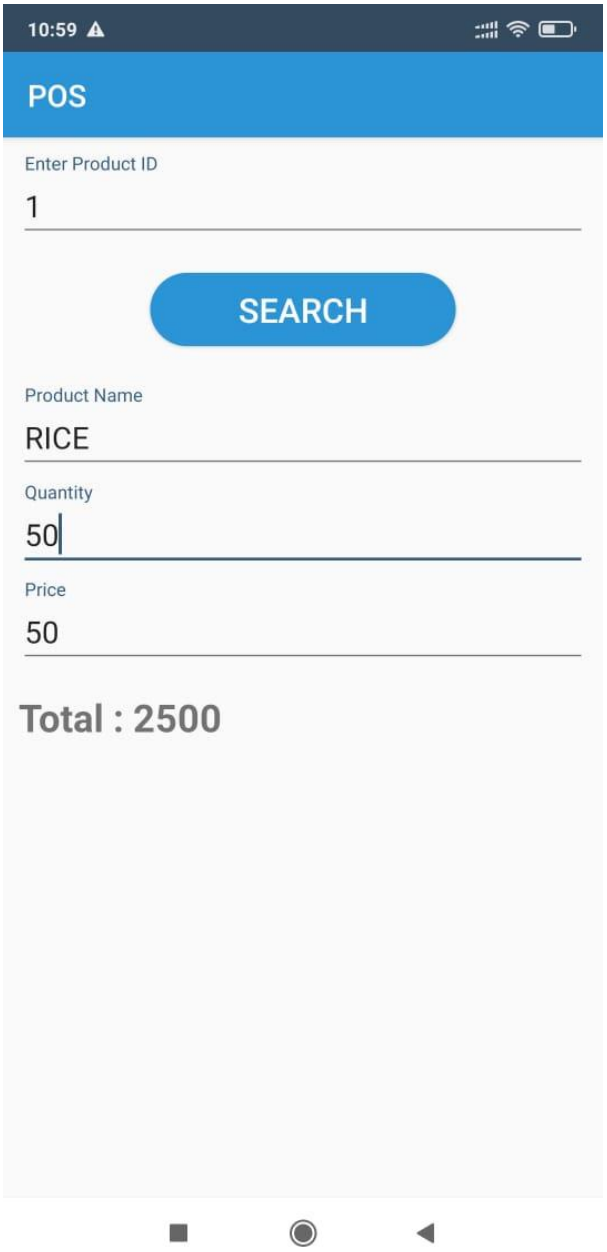
POS MODULE :-


10:58
POS
Enter Product ID
SEARCH
Product Name
Quantity
Price
Total

ENTER POS INFO :-



CALCULATE FINAL AMOUNT :-



# CONCLUSION AND FUTURE WORK

## 7.1 Advantages over Current System :-

In the Existing system the work are done only manually but in proposed system we can do our with computerized system using this application. Existing system includes following points:-

- Lack of security of data.
- More man power.
- Time consuming.
- Consumes large volume of paper work.
- Needs manual calculations.

The aim of proposed system is to develop a system of improved facilities. The proposed system can overcome all the limitations of the existing system. The system provides proper security and reduces the manual work.

- Security of data.
- Ensure data accuracy's.
- Proper control of the data by the users.
- Minimize manual data entry
- Minimum time needed for the various processing.
- Greater efficiency.
- Better service.
- User friendliness and interactive.
- Minimum time required.

**At the end it is concluded that we have made effort on following points…**

- A description of the background and context of the project and its relation to work already done in the area.
- The description of Purpose, Scope, and applicability.
- We define the problem on which we are working in the project.
- We describe the requirement Specifications of the system and the actions that can be done on these things.
- We understand the problem domain and produce a model of the system, which Describes operations that can be performed on the system.
- Finally, the system is implemented and tested according to test cases.

## 7.2 Future Enhancement:-

Nothing can be ended in a single step. It is the fact that nothing is permanent in this world. So this project also has some future enhancements in the evergreen and booming IT industry.

Further enhancement of the software will have the following features:

- This could be modified suitably to work on a network, protecting database integrity and ensuring integrity and ensuring consistency of data if it is distributed across multiple locations
- Other possibilities

## 7.3 Conclusion:-

- An attempt is made in all its earnest towords the successful completion of the project the system is verified with valid as well as invalid data.
- The system is user friendly since it has been developed in Android studio a successful GUI environment. since the connections can be extended to any database The control will be more powerful.
- Upgrading the system if may can be done without affecting the current proper functioning of the system.

Although I have put my best efforts to make the software flexible, easy to operate but limitations cannot be ruled out even by me.

## 7.4 System Maintenance :-

The application will definitely undergo change once it is delivered to the customer. There can be many reasons for this change to occur. Change could because of some unexcepted input values into the system.

# REFERENCES

We express our sincere gratitude to all those people who helped us in gathering the information while preparing this project. To prepare this project we required information regarding how to develop efficient & proper software on library management system.

**Reference Website:**

1. https://www.google.com

2. https://www.youtube.com

3. https://www.stack.com