RVS SATYANAND
CSE-A
106118083
LAB-7

Application Apk:<u>https://drive.google.com/file/d/1cNZZKxiX8ZDXxbAaWk69CLN7Eg9z6nPC/view?usp=sharing</u>

Mobile Application Development Laboratory – 7

Experiment Name: Working With Sqlite database.

Date: 05-04-2021

Aim: Design an Android application using Android Studio with the following specifications.

i) In an activity, have a login page with username, password and two buttons (register and login). New user can register by clicking on the register button which will redirect to another page. Existing user can login with their credentials.

ii) New users can register by providing the values in textboxes such as name, username, password, confirm password, email id, phone number. Upon clicking on the register button, check whether the username already exists and show a warning message using toasts. Otherwise add the data to the sqlite database and display :registration successful! Login" using toasts and redirect to login page.

iii) Upon successful login, use text views to display some welcome message and a list of registered user's names. Have a menu with a list of menu items such as Logout, Change password, Exit app.

- Logout - Logout and redirect to the login page.

- Change password - Redirect to a page where you take inputs such as current password, new password (using textviews and text boxes) and a submit button. Upon clicking the button, check whether the password matches and if it doesn't match, display error with toasts and clear the typed contents of the textboxes.

- Exit - Close the app.

Description of App: (The detailed working can be seen in screenshots)
1. We have an main Activity where only logged in users can enter, if a user is not logged in it'll be directed to the login page.

2. If User has an account he/she can directly log in or they have to create a new account by visiting the register page and once they register with valid input, they'll be redirected to the login page.

3. After Logging In with valid data, they can enter mainActivity which shows a list of the names of the registered users.

4. In the mainActivity menu bar user has an option to exit, logout and to change password.

5. If User clicks exit, the app will be closed, If the user clicks logout then the user will be logged out and redirected to the login page.

6. If the User clicks on Change password he/she will be redirected to a page which has 3 fields currentPassword, newPassword and re-enter newPassword, If user enters all details correctly the password will be changed and user will be redirected to mainActivity.

Note: Whenever a user does something unexpected like not giving input etc then I flash a message.

Device Specifications:
Both the app run on min SDK version of 16 (so anything above API 16 - Android 4.1 - Jelly Bean would run this app which is 99.8% of devices). Currently, I have run it on Pixel API 30 for outputs. Only default libraries were used for making any app and nothing additional.

Name: Pixel_3
Resolution: 1080 X 2220
API: 30
Target: Android 11.0
hw.lcd.height: 2220
hw.accelerometer: yes
hw.device.manufacturer: Google
hw.lcd.width: 1080
hw.lcd.density: 440
hw.cpu.ncore: 6
hw.sensors.proximity: yes
hw.sensors.orientation: yes
hw.gpu.enabled: yes

Technical Concepts Learnt:

● **Ui perspective:** I learned Working with, ScrollView, TextView, Button, ConstraintLayout, background colors, **Material.io** for styling.
● **Appln Perspective:**

1. Working of **Sqlite Database, Shared Preferences**.

2. Working with **Authentication** and **Authorization** of a user**.**
3. Learned How to change user passwords.
4. Handling exceptions using switch case and prompting errors using Toasts.
5. Checking if the valid input is provided or not.

Source Code:

AndroidManifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.lab_7">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.Lab7">

        <activity
            android:name=".ChangePassword"
            android:theme="@style/Theme.Lab7.NoActionBar" />

        <activity
            android:name=".RegisterActivity"
            android:theme="@style/Theme.Lab7.NoActionBar" />

        <activity
            android:name=".LoginActivity"
            android:theme="@style/Theme.Lab7.NoActionBar" />

        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>

    </application>

</manifest>
```

activity_main.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_gravity="center"
    android:orientation="vertical"
    tools:context=".MainActivity">


    <TextView

        android:id="@+id/textGreet"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:padding="10dp"
        android:textColor="@color/black"
        android:textSize="24sp"
        android:textStyle="bold|italic" />

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_gravity="center_horizontal"
        android:orientation="vertical"
        android:padding="10dp">

        <TextView
            android:id="@+id/textOutput"
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:gravity="center_vertical"
            android:textStyle="bold"
            android:textSize="18sp">

        </TextView>

    </LinearLayout>
</LinearLayout>
```

activity_login.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
```

```xml
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".LoginActivity">


    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:gravity="center"
        android:padding="20dp"
        android:text="Login"
        android:textColor="@color/black"
        android:textSize="36sp"
        android:textStyle="bold|italic" />

    <androidx.core.widget.NestedScrollView
        android:id="@+id/nestedScrollView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:paddingLeft="20dp"
        android:paddingTop="20dp"
        android:paddingRight="20dp"
        android:paddingBottom="20dp">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">


            <LinearLayout
                android:id="@+id/textInputLayoutEmail"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:orientation="vertical">


                <com.google.android.material.textfield.TextInputLayout
                    android:id="@+id/input_name"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_margin="20dp"
                    android:padding="5dp"
```

```xml
            android:textColor="@color/white"
            android:textSize="24sp"
            android:textStyle="bold|italic">

            <com.google.android.material.textfield.TextInputEditText
                android:id="@+id/username"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:autofillHints="Username"
                android:background="@color/very_light_gray"
                android:hint="Username"
                android:imeOptions="actionNext"
                android:inputType="text"
                android:lines="1"
                android:singleLine="true"
                android:textColor="@color/black"
                android:textSize="20sp"
                android:textStyle="bold|italic" />

        </com.google.android.material.textfield.TextInputLayout>
    </LinearLayout>

    <LinearLayout
        android:id="@+id/textInputLayoutPassword"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="vertical">


        <com.google.android.material.textfield.TextInputLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="20dp"
            android:padding="5dp"
            android:textColor="@color/white"
            android:textSize="24sp"
            android:textStyle="bold|italic">

            <com.google.android.material.textfield.TextInputEditText
                android:id="@+id/password"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:autofillHints="Password"
                android:background="@color/very_light_gray"
                android:hint="Password"
                android:imeOptions="actionNext"
                android:inputType="textPassword"
```

```xml
                    android:lines="1"
                    android:singleLine="true"
                    android:textColor="@color/black"
                    android:textSize="20sp"
                    android:textStyle="bold|italic" />

            </com.google.android.material.textfield.TextInputLayout>

        </LinearLayout>


        <androidx.appcompat.widget.AppCompatButton
            android:id="@+id/onSubmit"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:layout_marginTop="20dp"
            android:layout_marginBottom="10dp"
            android:background="@drawable/btn_state_green_gray"
            android:elevation="8dp"
            android:onClick="onClickLogin"
            android:paddingStart="50dp"
            android:paddingTop="10dp"
            android:paddingEnd="50dp"
            android:paddingBottom="10dp"
            android:text="Login"
            android:textColor="@color/white"
            android:textSize="18sp"
            android:textStyle="bold" />

        <TextView
            android:id="@+id/textViewLinkRegister"
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="30dp"
            android:gravity="center"
            android:onClick="redirectToRegister"
            android:text="@string/text_not_member"
            android:textSize="16sp" />
    </LinearLayout>
  </androidx.core.widget.NestedScrollView>

</LinearLayout>
```

activity_change_pssword.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
```

```xml
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".ChangePassword">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:gravity="center"
        android:padding="20dp"
        android:text="Change Password"
        android:textColor="@color/black"
        android:textSize="28sp"
        android:textStyle="bold|italic" />

    <androidx.core.widget.NestedScrollView
        android:id="@+id/nestedScrollView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:paddingLeft="20dp"
        android:paddingTop="20dp"
        android:paddingRight="20dp"
        android:paddingBottom="20dp">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">


            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_name"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_margin="10dp"
                android:paddingLeft="3dp"
                android:paddingRight="3dp"
                android:textColor="@color/white"
                android:textSize="18sp"
                android:textStyle="bold|italic">

                <com.google.android.material.textfield.TextInputEditText
                    android:id="@+id/curr_password"
                    android:layout_width="match_parent"
```

```xml
            android:layout_height="wrap_content"
            android:autofillHints="Current Password"
            android:background="@color/very_light_gray"
            android:hint="Current Password"
            android:imeOptions="actionNext"
            android:inputType="textPassword"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>


    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:paddingLeft="3dp"
        android:paddingRight="3dp"
        android:textColor="@color/white"
        android:textSize="18sp"
        android:textStyle="bold|italic">

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/password"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:autofillHints="New Password"
            android:background="@color/very_light_gray"
            android:hint="New Password"
            android:imeOptions="actionNext"
            android:inputType="textPassword"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>


    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
```

```xml
                    android:paddingLeft="3dp"
                    android:paddingRight="3dp"
                    android:textColor="@color/white"
                    android:textSize="18sp"
                    android:textStyle="bold|italic">

                    <com.google.android.material.textfield.TextInputEditText
                        android:id="@+id/confirm_password"
                        android:layout_width="match_parent"
                        android:layout_height="wrap_content"
                        android:autofillHints="New Password"
                        android:background="@color/very_light_gray"
                        android:hint="Re-Enter New Password"
                        android:imeOptions="actionNext"
                        android:inputType="textPassword"
                        android:lines="1"
                        android:singleLine="true"
                        android:textColor="@color/black"
                        android:textSize="20sp"
                        android:textStyle="bold|italic" />

                </com.google.android.material.textfield.TextInputLayout>


                <androidx.appcompat.widget.AppCompatButton
                    android:id="@+id/onSubmit"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:layout_gravity="center"
                    android:layout_marginTop="40dp"
                    android:layout_marginBottom="10dp"
                    android:background="@drawable/btn_state_green_gray"
                    android:onClick="onClickHandler"
                    android:paddingStart="50dp"
                    android:paddingTop="10dp"
                    android:paddingEnd="50dp"
                    android:paddingBottom="10dp"
                    android:text="Submit"
                    android:textColor="@color/white"
                    android:textSize="18sp"
                    android:textStyle="bold" />

        </LinearLayout>
    </androidx.core.widget.NestedScrollView>


</LinearLayout>
```

activity_register.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    tools:context=".RegisterActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:gravity="center"
        android:padding="20dp"
        android:text="Register"
        android:textColor="@color/black"
        android:textSize="36sp"
        android:textStyle="bold|italic" />

    <androidx.core.widget.NestedScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:paddingLeft="20dp"
        android:paddingTop="20dp"
        android:paddingRight="20dp"
        android:paddingBottom="20dp">

        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="match_parent"
            android:orientation="vertical">

            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_name"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_margin="10dp"
                android:paddingLeft="3dp"
                android:paddingRight="3dp"
                android:textColor="@color/white"
                android:textSize="18sp"
                android:textStyle="bold|italic">

                <com.google.android.material.textfield.TextInputEditText
```

```xml
            android:id="@+id/name"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:autofillHints="Name"
            android:background="@color/very_light_gray"
            android:hint="Name"
            android:imeOptions="actionNext"
            android:inputType="text"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>


    <com.google.android.material.textfield.TextInputLayout

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:paddingLeft="3dp"
        android:paddingRight="3dp"
        android:textColor="@color/white"
        android:textSize="18sp"
        android:textStyle="bold|italic">

        <com.google.android.material.textfield.TextInputEditText

            android:id="@+id/username"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:autofillHints="Username"
            android:background="@color/very_light_gray"
            android:hint="Username"
            android:imeOptions="actionNext"
            android:inputType="text"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>
```

```xml
<com.google.android.material.textfield.TextInputLayout

    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="10dp"
    android:paddingLeft="3dp"
    android:paddingRight="3dp"
    android:textColor="@color/white"
    android:textSize="18sp"
    android:textStyle="bold|italic">

    <com.google.android.material.textfield.TextInputEditText
        android:id="@+id/email"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:autofillHints="Email"
        android:background="@color/very_light_gray"
        android:hint="Email"
        android:imeOptions="actionNext"
        android:inputType="textEmailAddress"
        android:lines="1"
        android:singleLine="true"
        android:textColor="@color/black"
        android:textSize="20sp"
        android:textStyle="bold|italic" />

</com.google.android.material.textfield.TextInputLayout>


<com.google.android.material.textfield.TextInputLayout

    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_margin="10dp"
    android:paddingLeft="3dp"
    android:paddingRight="3dp"
    android:textColor="@color/white"
    android:textSize="18sp"
    android:textStyle="bold|italic">

    <com.google.android.material.textfield.TextInputEditText
        android:id="@+id/number"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:autofillHints="Phone Number"
        android:background="@color/very_light_gray"
        android:hint="Phone Number"
```

```xml
            android:imeOptions="actionNext"
            android:inputType="phone"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>


    <com.google.android.material.textfield.TextInputLayout

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:paddingLeft="3dp"
        android:paddingRight="3dp"
        android:textColor="@color/white"
        android:textSize="18sp"
        android:textStyle="bold|italic">

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/password"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:autofillHints="Password"
            android:background="@color/very_light_gray"
            android:hint="@string/hint_password"
            android:imeOptions="actionNext"
            android:inputType="textPassword"
            android:lines="1"
            android:singleLine="true"
            android:textColor="@color/black"
            android:textSize="20sp"
            android:textStyle="bold|italic" />

    </com.google.android.material.textfield.TextInputLayout>


    <com.google.android.material.textfield.TextInputLayout

        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:paddingLeft="3dp"
        android:paddingRight="3dp"
```

```xml
                android:textColor="@color/white"
                android:textSize="18sp"
                android:textStyle="bold|italic">

                <com.google.android.material.textfield.TextInputEditText
                    android:id="@+id/confirm_password"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:autofillHints="Password"
                    android:background="@color/very_light_gray"
                    android:hint="Confirm Password"
                    android:imeOptions="actionNext"
                    android:inputType="textPassword"
                    android:lines="1"
                    android:singleLine="true"
                    android:textColor="@color/black"
                    android:textSize="20sp"
                    android:textStyle="bold|italic" />

        </com.google.android.material.textfield.TextInputLayout>

        <androidx.appcompat.widget.AppCompatButton
            android:id="@+id/register"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_gravity="center"
            android:layout_marginTop="40dp"
            android:layout_marginBottom="10dp"
            android:background="@drawable/btn_state_green_gray"
            android:onClick="onClickRegister"
            android:paddingStart="50dp"
            android:paddingTop="10dp"
            android:paddingEnd="50dp"
            android:paddingBottom="10dp"
            android:text="Register"
            android:textColor="@color/white"
            android:textSize="18sp"
            android:textStyle="bold" />

        <TextView
            android:layout_width="fill_parent"
            android:layout_height="wrap_content"
            android:layout_marginTop="30dp"
            android:gravity="center"
            android:onClick="redirectToLogin"
            android:text="Already a member? Login"
            android:textSize="16sp" />
```

```
        </LinearLayout>
    </androidx.core.widget.NestedScrollView>


</LinearLayout>
```

User.java

```java
package com.example.lab_7;

public class User {
    private int id;
    private String name, username, phone, email, password;

    public int getId() {
        return id;
    }

    public void setId(int id) {
        this.id = id;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getUsername() {
        return username;
    }

    public void setUsername(String username) {
        this.username = username;
    }

    public String getEmail() {
        return email;
    }

    public void setEmail(String email) {
        this.email = email;
    }

    public String getPhone() {
        return phone;
    }
}
```

```java
    public void setPhone(String phone) {
        this.phone = phone;
    }

    public String getPassword() {
        return password;
    }

    public void setPassword(String password) {
        this.password = password;
    }
}
```

RegisterActivity.java

```java
package com.example.lab_7;

import androidx.appcompat.app.AppCompatActivity;

import android.content.Intent;
import android.os.Bundle;
import android.text.TextUtils;
import android.util.Patterns;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import com.google.android.material.snackbar.Snackbar;

public class RegisterActivity extends AppCompatActivity {

    EditText name, username, email, password, confirm_password, mobile_number;
    Button register;
    DatabaseHelper databaseHelper;


    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_register);

        name = findViewById(R.id.name);
        username = findViewById(R.id.username);
        email = findViewById(R.id.email);
        password = findViewById(R.id.password);
```

```java
        confirm_password = findViewById(R.id.confirm_password);
        mobile_number = findViewById(R.id.number);
        register = findViewById(R.id.register);
    }

    public void redirectToLogin(View view) {
        Intent i = new Intent(this, LoginActivity.class);
        i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK | Intent.FLAG_ACTIVITY_CLEAR_TASK);
        startActivity(i);
    }

    public static boolean isValidEmail(CharSequence target) {
        return (!TextUtils.isEmpty(target) &&
Patterns.EMAIL_ADDRESS.matcher(target).matches());
    }

    public void onClickRegister(View view) {

        String Name, Username, Email, Password, ConfirmPassword, MobileNumber;
        Name = name.getText().toString().trim();
        Username = username.getText().toString().trim();
        MobileNumber = mobile_number.getText().toString().trim();
        Email = email.getText().toString().trim();
        Password = password.getText().toString().trim();
        ConfirmPassword = confirm_password.getText().toString().trim();

        if (Name.length() < 4) {
            Toast.makeText(this, "Name should have atleast 4 chars",
Toast.LENGTH_SHORT).show();
            return;
        }

        String x[] = Username.split(" ");

        if (Username.length() < 4 || x.length != 1) {
            Toast.makeText(this, "Username should have atleast 4 chars and should be 1
word!", Toast.LENGTH_SHORT).show();
            return;
        }
        if (!isValidEmail(Email)) {
            Toast.makeText(this, "Please Enter Valid Email!",
Toast.LENGTH_SHORT).show();
            return;
        }

        if (!Password.equals(ConfirmPassword)) {
            Toast.makeText(this, "Password doesn't match", Toast.LENGTH_SHORT).show();
```

```java
                return;
        }

        if (Password.length() < 4) {
            Toast.makeText(this, "Password Should be more than 4 chars",
Toast.LENGTH_SHORT).show();
                return;
        }

        if (MobileNumber.length() < 7) {
            Toast.makeText(this, "Mobile Number Should be atleast 7 digits",
Toast.LENGTH_SHORT).show();
                return;
        }

        databaseHelper = new DatabaseHelper(this);

        if (!databaseHelper.checkUserIfExists(Email, Username)) {

            User user = new User();

            user.setEmail(Email);
            user.setPhone(MobileNumber);
            user.setName(Name);
            user.setUsername(Username);
            user.setPassword(Password);

            databaseHelper.addUser(user);

            Toast.makeText(this, "Successfully Registered, Login To Proceed!",
Toast.LENGTH_SHORT).show();
            Intent i = new Intent(this, LoginActivity.class);
            i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
            startActivity(i);
        } else {
            Toast.makeText(this, "User with this Username or Email Exists!",
Toast.LENGTH_SHORT).show();
        }

    }
}
```

MainActivity.java

```java
package com.example.lab_7;

import androidx.annotation.NonNull;
```

```java
import androidx.appcompat.app.AppCompatActivity;

import android.annotation.SuppressLint;
import android.content.Context;
import android.content.Intent;
import android.content.SharedPreferences;
import android.net.Uri;
import android.os.Bundle;
import android.util.Log;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.TextView;
import android.widget.Toast;

import java.util.List;

public class MainActivity extends AppCompatActivity {

    TextView TextOutput, TextGreet;
    SharedPreferences sh;
    DatabaseHelper databaseHelper;

    @SuppressLint("SetTextI18n")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);

        sh = getSharedPreferences("lab-07", MODE_PRIVATE);
        databaseHelper = new DatabaseHelper(this);
        int isLoggedIn = sh.getInt("isLoggedIn", 0);

        if (isLoggedIn == 1) {
            setContentView(R.layout.activity_main);
            String username = sh.getString("username", "0");


            TextGreet = findViewById(R.id.textGreet);
            TextGreet.setText("Welcome back, " + username);

            List<String> names = databaseHelper.getAllUser();

            String output = "Registered Users- \n\n\n";
            for (String name : names) {
                output = output + "\t\t• " + name + "\n\n";
            }

            TextOutput = findViewById(R.id.textOutput);
```

```java
            TextOutput.setText(output);

        } else {
            Toast.makeText(this, "Please Login To Proceed!",
Toast.LENGTH_SHORT).show();
            Intent i = new Intent(this, LoginActivity.class);
            i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
            startActivity(i);
        }
    }


    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.my_menu, menu);
        return super.onCreateOptionsMenu(menu);
    }

    @SuppressLint("NonConstantResourceId")
    @Override
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {
        switch (item.getItemId()) {
            case R.id.changePassword: {
                Intent i = new Intent(this, ChangePassword.class);
                startActivity(i);
                break;
            }

            case R.id.logout: {
                sh.edit().remove("isLoggedIn").apply();
                sh.edit().remove("username").apply();

                Intent i = new Intent(this, LoginActivity.class);
                i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
                startActivity(i);
                break;
            }

            case R.id.ext: {
                finish();
                System.exit(0);
                break;
            }
        }
```

```
            return super.onOptionsItemSelected(item);
    }
}
```

LoginActivity.java

```java
package com.example.lab_7;

import androidx.appcompat.app.AppCompatActivity;

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

import com.google.android.material.snackbar.Snackbar;

public class LoginActivity extends AppCompatActivity {

    EditText username, password;
    Button register;
    DatabaseHelper databaseHelper;
    SharedPreferences sharedPreferences;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_login);

        username = findViewById(R.id.username);
        password = findViewById(R.id.password);
        register = findViewById(R.id.onSubmit);
        databaseHelper = new DatabaseHelper(this);
        sharedPreferences = getSharedPreferences("lab-07", MODE_PRIVATE);
    }

    public void redirectToRegister(View view) {
        Intent i = new Intent(this, RegisterActivity.class);
        i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK | Intent.FLAG_ACTIVITY_CLEAR_TASK);
        startActivity(i);
    }

    public void onClickLogin(View view) {
```

```java
        String Username, Password;
        Username = username.getText().toString().trim();
        Password = password.getText().toString().trim();


        if (!databaseHelper.checkUser(Username, Password)) {
            Toast.makeText(this, "Username or Password is wrong!",
Toast.LENGTH_SHORT).show();
            return;
        } else {
            SharedPreferences.Editor myEdit = sharedPreferences.edit();
            myEdit.putString("username", Username);
            myEdit.putInt("isLoggedIn", 1);
            myEdit.commit();

            Intent i = new Intent(this, MainActivity.class);
            i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
            startActivity(i);

            return;
        }
    }
}
```

DatabaseHelper.java

```java
package com.example.lab_7;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import android.util.Log;

import java.util.ArrayList;
import java.util.List;

public class DatabaseHelper extends SQLiteOpenHelper {
    // Database Version
    private static final int DATABASE_VERSION = 1;

    // Database Name
    private static final String DATABASE_NAME = "UserManager.db";

    // User table name
    private static final String TABLE_USER = "user";
```

```java
// User Table Columns names
private static final String COLUMN_USER_ID = "user_id";
private static final String COLUMN_USER_NAME = "user_name";
private static final String COLUMN_USER_USERNAME = "user_username";
private static final String COLUMN_USER_PHONE = "user_phone";
private static final String COLUMN_USER_EMAIL = "user_email";
private static final String COLUMN_USER_PASSWORD = "user_password";

// create table sql query
private String CREATE_USER_TABLE = "CREATE TABLE " + TABLE_USER + "("
        + COLUMN_USER_ID + " INTEGER PRIMARY KEY AUTOINCREMENT,"
        + COLUMN_USER_NAME + " TEXT,"
        + COLUMN_USER_USERNAME + " TEXT,"
        + COLUMN_USER_PHONE + " TEXT,"
        + COLUMN_USER_EMAIL + " TEXT,"
        + COLUMN_USER_PASSWORD + " TEXT" + ")";

// drop table sql query
private String DROP_USER_TABLE = "DROP TABLE IF EXISTS " + TABLE_USER;

//  Constructor
public DatabaseHelper(Context context) {
    super(context, DATABASE_NAME, null, DATABASE_VERSION);
}

@Override
public void onCreate(SQLiteDatabase db) {
    db.execSQL(CREATE_USER_TABLE);
}

@Override
public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
    //Drop User Table if exist
    db.execSQL(DROP_USER_TABLE);
    // Create tables again
    onCreate(db);
}

public void addUser(User user) {
    SQLiteDatabase db = this.getWritableDatabase();

    ContentValues values = new ContentValues();
    values.put(COLUMN_USER_NAME, user.getName());
    values.put(COLUMN_USER_USERNAME, user.getUsername());
    values.put(COLUMN_USER_PHONE, user.getPhone());
    values.put(COLUMN_USER_EMAIL, user.getEmail());
    values.put(COLUMN_USER_PASSWORD, user.getPassword());
```

```java
        // Inserting Row
        db.insert(TABLE_USER, null, values);
        db.close();
    }

    public List<String> getAllUser() {

        // array of columns to fetch
        String[] columns = {
                COLUMN_USER_NAME,
        };

        // sorting orders
        String sortOrder =
                COLUMN_USER_NAME + " ASC";

        List<String> userList = new ArrayList<String>();

        SQLiteDatabase db = this.getReadableDatabase();

        Cursor cursor = db.query(TABLE_USER, //Table to query
                columns,    //columns to return
                null,         //columns for the WHERE clause
                null,          //The values for the WHERE clause
                null,         //group the rows
                null,         //filter by row groups
                sortOrder); //The sort order


        // Traversing through all rows and adding to list
        if (cursor.moveToFirst()) {
            do {
                // Adding user record to list

userList.add(cursor.getString(cursor.getColumnIndex(COLUMN_USER_NAME)));
            } while (cursor.moveToNext());
        }

        cursor.close();
        db.close();

        // return user list
        return userList;
    }
```

```java
    public void updateUser(String username, String password) {
        SQLiteDatabase db = this.getWritableDatabase();
        String query = "UPDATE " + TABLE_USER + " SET " + COLUMN_USER_PASSWORD + " =
\"" + password +
                "\"" + " WHERE " + COLUMN_USER_USERNAME + " = \"" + username + "\"";
        db.execSQL(query);
    }

    public boolean checkUserIfExists(String email, String username) {

        // array of columns to fetch
        String[] columns = {
                COLUMN_USER_ID
        };
        SQLiteDatabase db = this.getReadableDatabase();

        // selection criteria
        String selection = COLUMN_USER_EMAIL + " = ? or " + COLUMN_USER_USERNAME + " =
?";

        // selection argument
        String[] selectionArgs = {email, username};


        Cursor cursor = db.query(TABLE_USER, //Table to query
                columns,                    //columns to return
                selection,                  //columns for the WHERE clause
                selectionArgs,              //The values for the WHERE clause
                null,                       //group the rows
                null,                       //filter by row groups
                null);                      //The sort order
        int cursorCount = cursor.getCount();
        cursor.close();
        db.close();

        if (cursorCount > 0) {
            return true;
        }

        return false;
    }

    public boolean checkUser(String username, String password) {

        // array of columns to fetch
        String[] columns = {
                COLUMN_USER_ID
```

```java
        };
        SQLiteDatabase db = this.getReadableDatabase();
        // selection criteria
        String selection = COLUMN_USER_USERNAME + " = ?" + " AND " +
COLUMN_USER_PASSWORD + " = ?";


        // selection arguments
        String[] selectionArgs = {username, password};



        Cursor cursor = db.query(TABLE_USER,
                columns,
                selection,
                selectionArgs,
                null,
                null,
                null);

        int cursorCount = cursor.getCount();

        cursor.close();
        db.close();
        if (cursorCount > 0) {
            return true;
        }
        return false;
    }


}
```

ChangePassword.java

```java
package com.example.lab_7;

import androidx.appcompat.app.AppCompatActivity;

import android.app.Activity;
import android.content.Intent;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class ChangePassword extends AppCompatActivity {
```

```java
    EditText confirm_password, password, current_password;
    DatabaseHelper databaseHelper;
    SharedPreferences sh;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_change_password);

        databaseHelper = new DatabaseHelper(this);

        sh = getSharedPreferences("lab-07", MODE_PRIVATE);
        password = findViewById(R.id.password);
        confirm_password = findViewById(R.id.confirm_password);
        current_password = findViewById(R.id.curr_password);
    }

    public void onClickHandler(View view) {
        String Password, ConfirmPassword, CurrentPassword;
        Password = password.getText().toString().trim();
        ConfirmPassword = confirm_password.getText().toString().trim();
        CurrentPassword = current_password.getText().toString().trim();
        String Username = sh.getString("username", "");

        if (!databaseHelper.checkUser(Username, CurrentPassword)) {
            Toast.makeText(this, "Current password is wrong",
Toast.LENGTH_SHORT).show();
            return;
        }

        if (!Password.equals(ConfirmPassword)) {
            Toast.makeText(this, "New Password doesn't match",
Toast.LENGTH_SHORT).show();
            return;
        }

        if (Password.length() < 4) {
            Toast.makeText(this, "New Password Should be more than 4 chars",
Toast.LENGTH_SHORT).show();
            return;
        }


        try {
            databaseHelper.updateUser(Username, Password);
```

```java
            Toast.makeText(this, " Password Successfully Updated!",
Toast.LENGTH_SHORT).show();

            Intent i = new Intent(this, MainActivity.class);
            i.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
Intent.FLAG_ACTIVITY_CLEAR_TASK);
            startActivity(i);

        } catch (Exception e) {
            String msg = e.getMessage();
            Toast.makeText(this, "SOMETHING WENT WRONG ", Toast.LENGTH_SHORT);
        }
    }
}
```
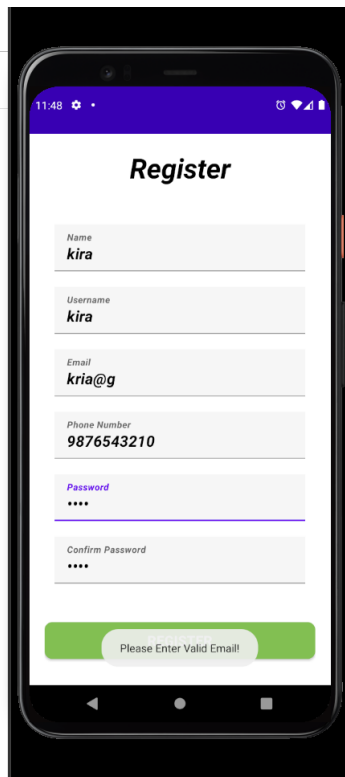
Screenshots:
Start:
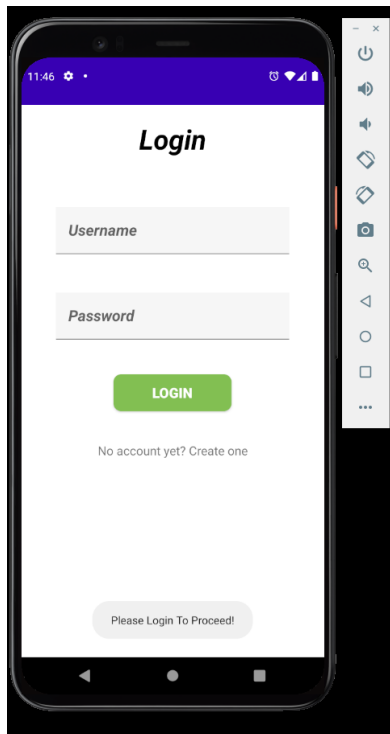
Since there's no user registered yet, so I clicked on create one(Which will redirect me to register page):
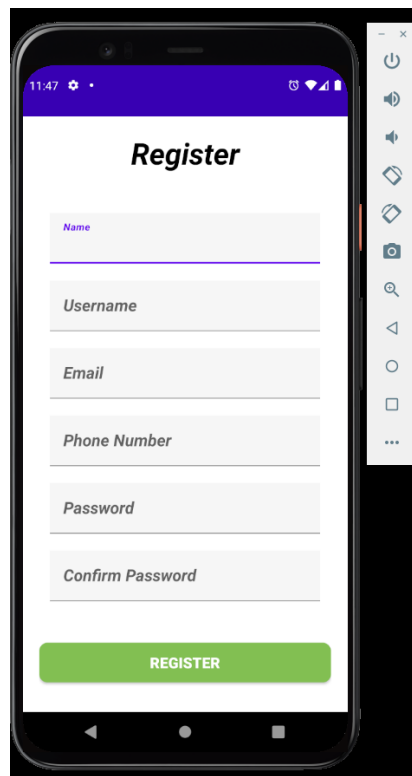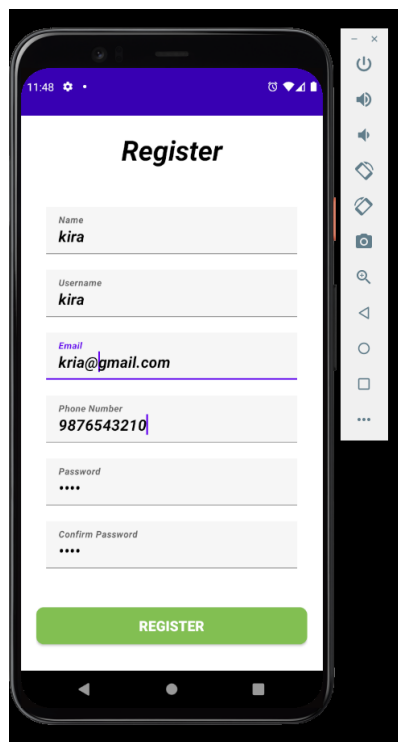
In register page each field has its own validation and if anyone of it fails i'll show the error message using toast (See I deliberately kept email wrong and it shows me to correct it)

After Valid Inputs:

After registration it leads to Login page:
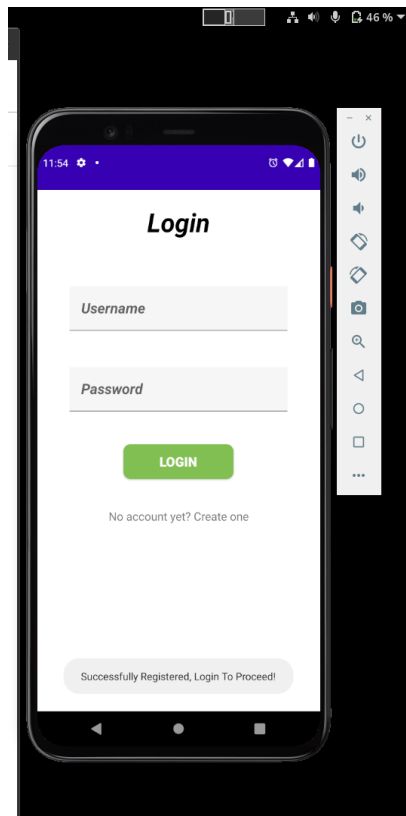
Now I'll Login, For demonstrations of err handling I'll give wrong input:
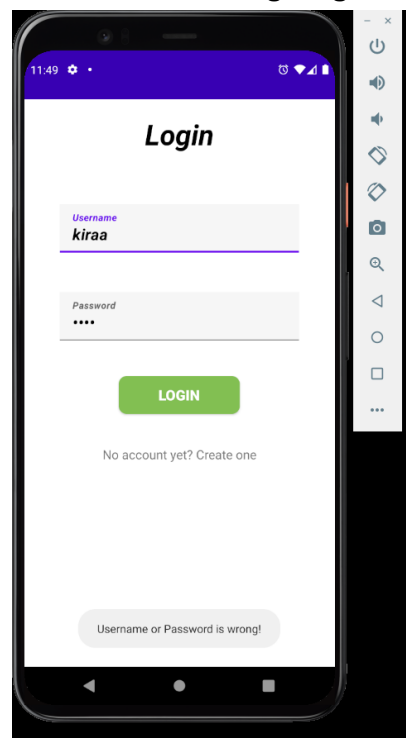
After Entering Valid Data and Logging In: (It Shows the list of user's name)
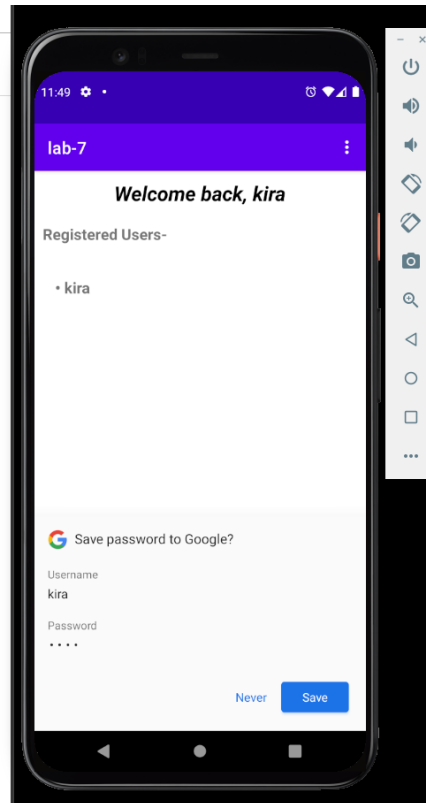
Now Clicking On Menu options:
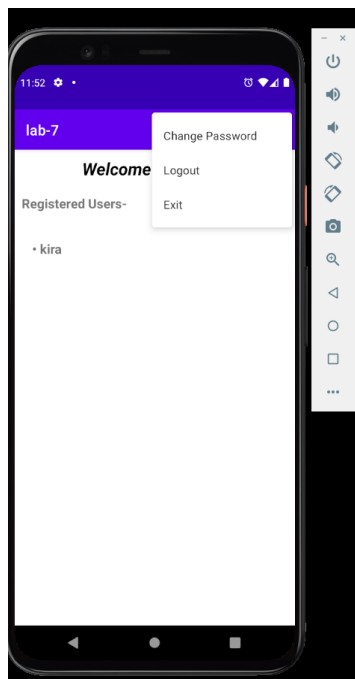
If I choose Change Password:
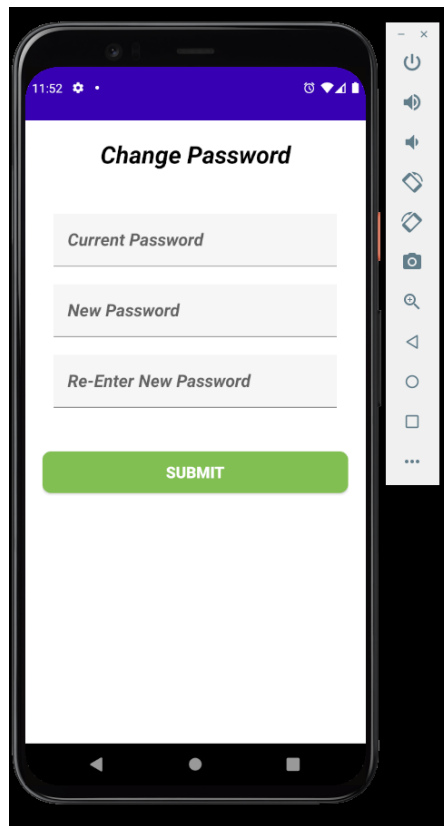
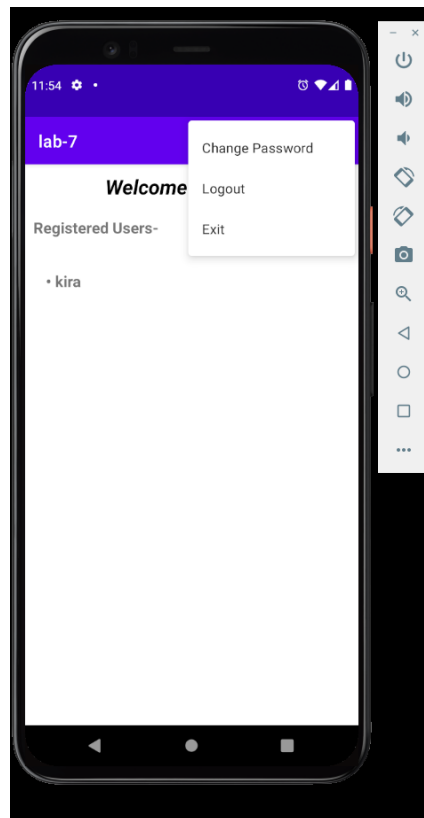**Now I deliberately gave my wrong password as my current password, so it says the wrong current password.**
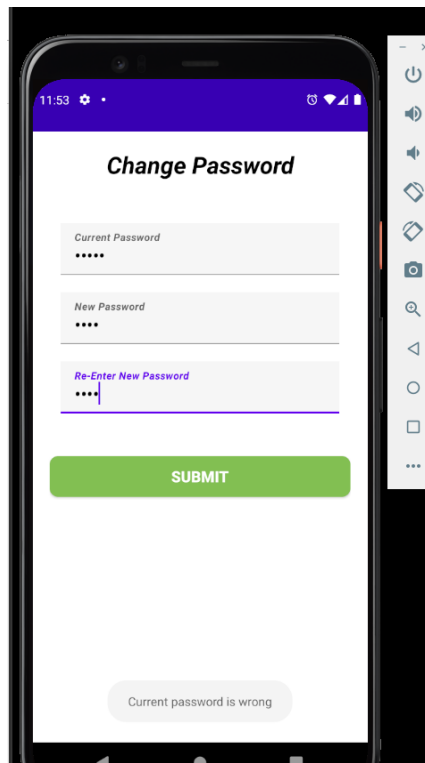
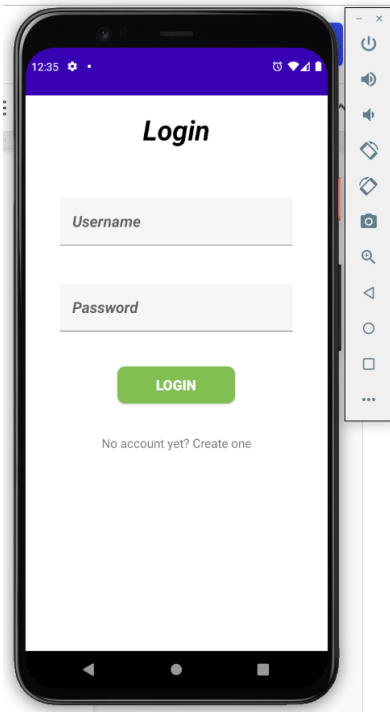**Now I'll give correct current password but the new password does not matches:**
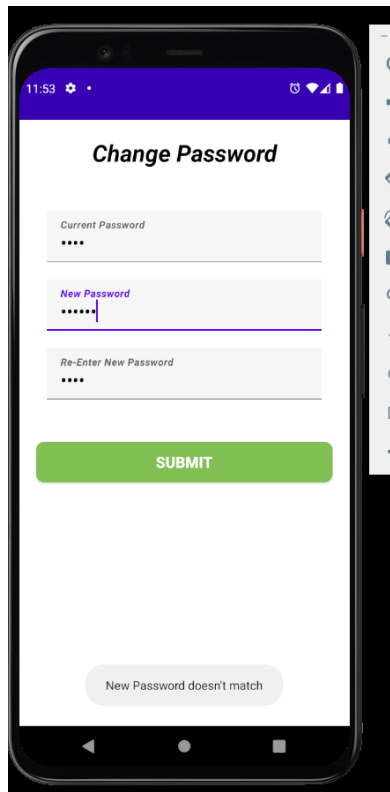
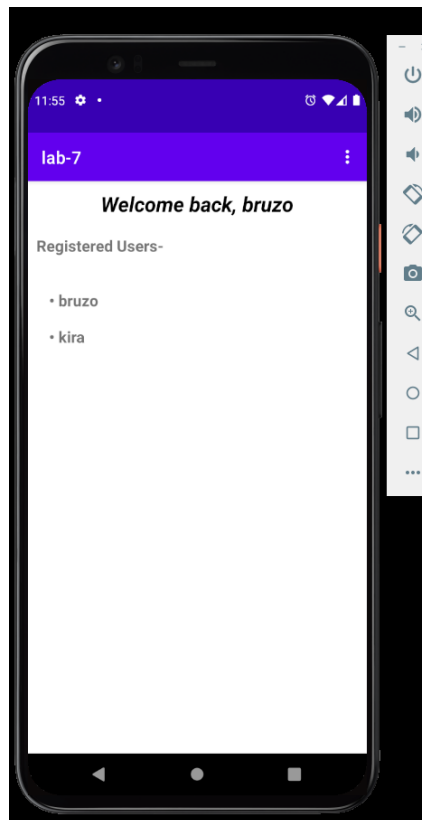**Now giving everything correctly: (It says password updated)**
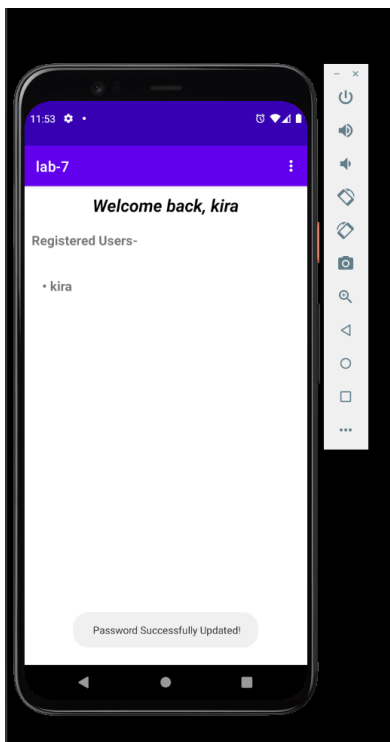
On Clicking on Exit (Will close the application):
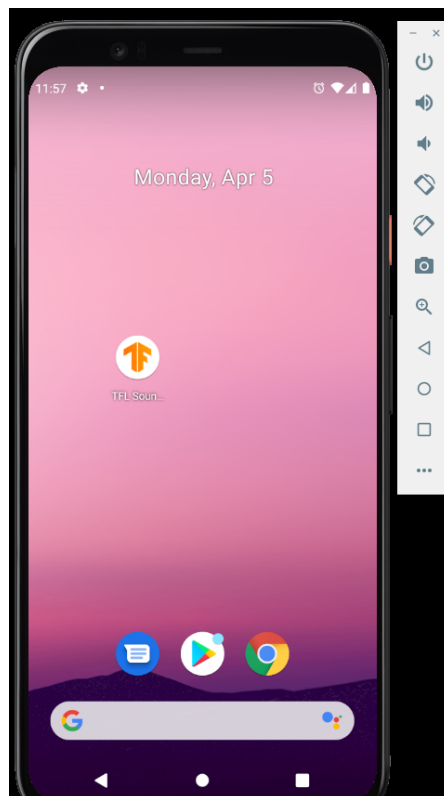
On Clicking Logout (It logs out and redirect to Login page again):

I created one more account to show how really it looks:

Outcomes: The app was developed and run without any bugs/crashes, and we learned authentication in action.

Practical Applications:
1. Can design an application with multiple levels of authorization like mentor, student etc
2. Can make an application which stores user priorities and shows them news, sports according to their preference.