1. Installing the Java Development Kit

The Android SDK was developed using the Java programming language. Similarly, Android

applications are also developed using Java. As a result, the Java Development Kit (JDK) is the first

component that must be installed. Android development requires the installation of either version 6 or 7 of

the Standard Edition of the Java Platform Development Kit. Java is provided in both development (JDK)

and runtime (JRE) packages. For the purposes of Android development, the JDK must be installed.

2. Downloading the Android Studio Package

Most of the work involved in developing applications for Android will be performed using the Android

Studio environment. Android Studio may be downloaded from the following web page:

http://developer.android.com/sdk/index.html

From this page, either click on the download button if it lists the correct platform (for example on a

Windows based web browser the button will read “Download Android Studio for Windows”), or select the

“Other Download Options” link to manually select the appropriate package for your platform and operating

system. On the subsequent screen, accept the terms and conditions to initiate the download.

3. Installing Android Studio

Locate the downloaded Android Studio installation executable file (named android-studio-bundle-

<version>.exe) in a Windows Explorer window and double click on it to start the installation process,

clicking the Yes button in the User Account Control dialog if it appears.

Once the Android Studio setup wizard appears, work through the various screens to configure the

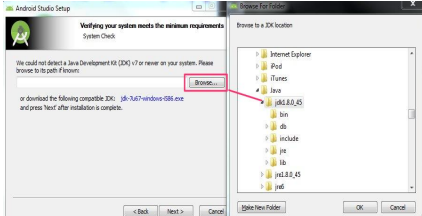
installation to meet your requirements in terms of the file system location into which Android Studio should

be installed and whether or not it should be made available to other users of the system. Although there are

no strict rules on where Android Studio should be installed on the system, the remainder of this book will

assume that the installation was performed into a sub-folder of the user’s home directory named androidstudio. Once the options have been configured, click on the Install button to begin the installation process.







4. The Android Studio Setup Wizard

The first time that Android Studio is launched after being installed, a dialog will appear providing the

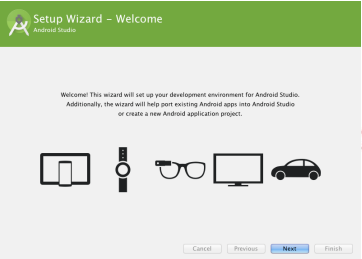
option to import settings from a previous Android Studio version. If you have settings from a previous

version and would like to import them into the latest installation, select the appropriate option and location.

Alternatively, indicate that you do not need to import any previous settings and click on the OK button to

proceed.

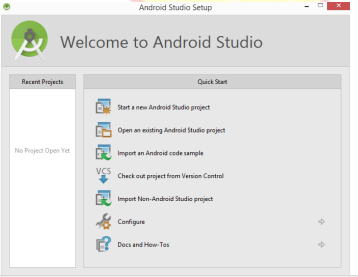
After Android Studio has finished loading, the setup wizard will appear as shown



Click on the Next button, choose the Standard installation option and click on Next once again. On the

license agreement screen, select and accept each of the licenses listed before clicking on Finish to complete

the setup process. The Welcome to Android Studio screen should then appear:



5. Installing the Latest Android SDK Packages

The steps performed so far have installed Java, the Android Studio IDE and the current set of default

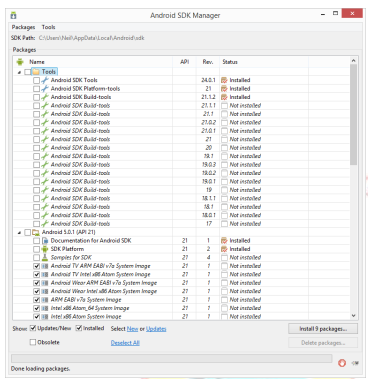
Android SDK packages. Before proceeding, it is worth taking some time to verify which packages are

installed and to install any missing packages.

This task can be performed using the Android SDK Manager, which may be launched from within

the Android Studio tool by selecting the Configure -> SDK Manager option from within the Android Studio

welcome dialog. Once invoked, the SDK Manager tool will appear as illustrated in Figure



Within the Android SDK Manager, make sure that the following packages are listed as Installed in the

Status column:

* Tools > Android SDK Tools
* Tools > Android SDK Platform-tools
* Tools > Android SDK Build-tools
* SDK Platform (most recent version) > SDK Platform
* SDK Platform (most recent version) > ARM EABI v7a System Image
* Extras > Android Support Repository
* Extras > Android Support Library
* Extras > Google Repository
* Extras > Google USB Driver (Required on Windows systems only)
* Extras > Intel x86 Emulator Accelerator (HAXM installer)

In the event that any of the above packages are listed as Not Installed, simply select the checkboxes

next to those packages and click on the Install packages button to initiate the installation process. In the

resulting dialog, accept the license agreements before clicking on the Install button. The SDK Manager

will then begin to download and install the designated packages. As the installation proceeds, a progress

bar will appear at the bottom of the manager window indicating the status of the installation.

Once the installation is complete, review the package list and make sure that the selected packages

are now listed as Installedin the Status column. If any are listed as Not installed, make sure they are selected

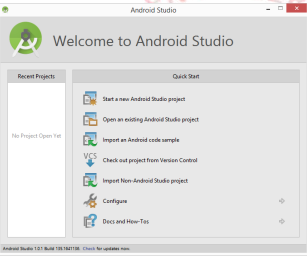
and click on the Install packages… button again.

6. Creating a New Android Project

The first step in the application development process is to create a new project within the Android

Studio environment. Begin, therefore, by launching Android Studio so that the “Welcome to Android

Studio” screen appears as illustrated in Figure



Once this window appears, Android Studio is ready for a new project to be created. To create the new

project, simply click on the Start a new Android Studio project option to display the first screen of the New

Project wizard as shown in Figure

7. Defining the Project and SDK Settings

In the New Project window, set the Application name field to EXNO1. The application name is the

name by which the application will be referenced and identified within Android Studio and is also the name

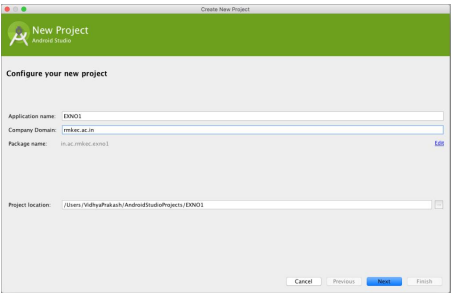
that will be used when the completed application goes on sale in the Google Play store.

The Package Name is used to uniquely identify the application within the Android application

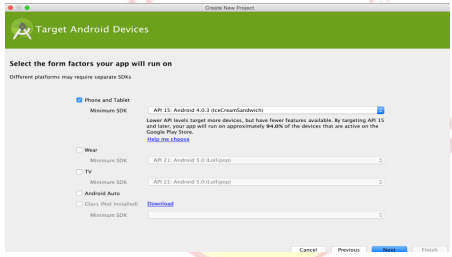
ecosystem. It should be based on the reversed URL of your domain name followed by the name of the

application. For example, if your domain is rmkec.ac.in, and the application has been named EXNO1, then

the package name might be specified as follows:



Next select Android package SDK we need to build



**Main\_Activity.java:**

package com.example.fontcolorapp;

import android.graphics.Color;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

TextView textView;

Button sizeBtn, colorBtn;

float fontSize = 20f;

int colorIndex = 0;

int[] colors = {Color.BLUE, Color.GREEN, Color.RED, Color.MAGENTA};

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

textView = findViewById(R.id.textView);

sizeBtn = findViewById(R.id.sizeButton);

colorBtn = findViewById(R.id.colorButton);

sizeBtn.setOnClickListener(v -> {

textView.setTextSize(fontSize);

fontSize += 4;

if (fontSize > 40) fontSize = 20;

});

colorBtn.setOnClickListener(v -> {

textView.setTextColor(colors[colorIndex]);

colorIndex = (colorIndex + 1) % colors.length;

});

}

}

**Activity.xml:**

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:orientation="vertical"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:gravity="center"

android:padding="20dp">

<TextView

android:id="@+id/textView"

android:text="Hello World!"

android:textSize="20sp"

android:textColor="#000000"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:padding="20dp"/>

<Button

android:id="@+id/sizeButton"

android:text="Change Font Size"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="30dp"/>

<Button

android:id="@+id/colorButton"

android:text="Change Font Color"

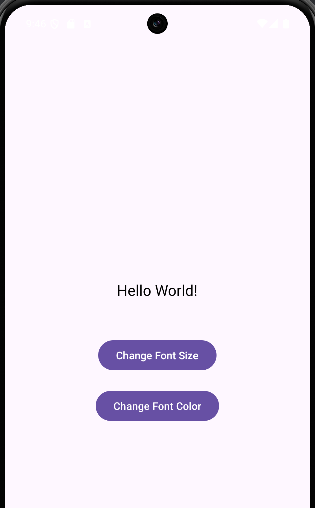
android:layout\_width="wrap\_content"

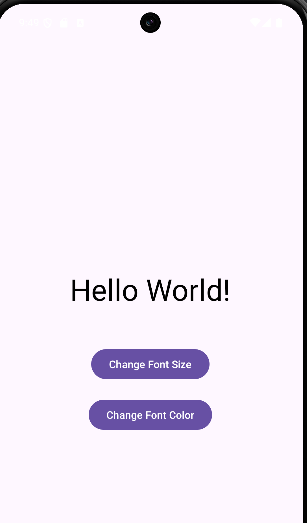
android:layout\_height="wrap\_content"

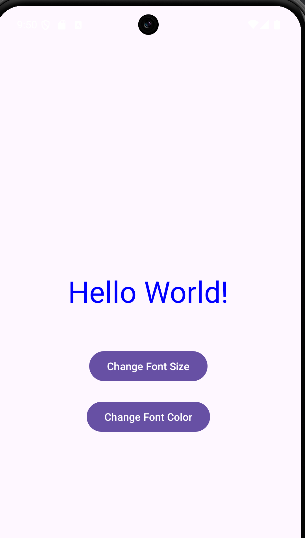
android:layout\_marginTop="20dp"/>

</LinearLayout>

**Output:**

****

****

****

**Main\_Activity.java:**

package com.example.simpleadder;

import android.app.NotificationChannel;

import android.app.NotificationManager;

import android.os.Build;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import androidx.core.app.NotificationCompat;

public class MainActivity extends AppCompatActivity {

EditText edit1, edit2;

Button addButton;

final String CHANNEL\_ID = "simple\_channel";

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

edit1 = findViewById(R.id.editText1);

edit2 = findViewById(R.id.editText2);

addButton = findViewById(R.id.button1);

createNotificationChannel();

addButton.setOnClickListener(v -> {

try {

int num1 = Integer.parseInt(edit1.getText().toString());

int num2 = Integer.parseInt(edit2.getText().toString());

int sum = num1 + num2;

String message = "Sum is: " + sum;

Toast.makeText(MainActivity.this, message, Toast.LENGTH\_LONG).show();

// Push-style notification

NotificationCompat.Builder builder = new NotificationCompat.Builder(MainActivity.this, CHANNEL\_ID)

.setSmallIcon(android.R.drawable.ic\_dialog\_info)

.setContentTitle("Addition Result")

.setContentText(message)

.setPriority(NotificationCompat.PRIORITY\_DEFAULT);

NotificationManager manager = (NotificationManager) getSystemService(NOTIFICATION\_SERVICE);

manager.notify(1, builder.build());

} catch (Exception e) {

Toast.makeText(MainActivity.this, "Enter valid numbers", Toast.LENGTH\_SHORT).show();

}

});

}

// Notification Channel required for Android 8.0+

private void createNotificationChannel() {

if (Build.VERSION.SDK\_INT >= Build.VERSION\_CODES.O) {

CharSequence name = "SimpleChannel";

String description = "For Addition Notifications";

int importance = NotificationManager.IMPORTANCE\_DEFAULT;

NotificationChannel channel = new NotificationChannel(CHANNEL\_ID, name, importance);

channel.setDescription(description);

NotificationManager notificationManager = getSystemService(NotificationManager.class);

notificationManager.createNotificationChannel(channel);

}

}

}

**Activity.xml:**

<?xml version="1.0" encoding="utf-8"?>

<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:padding="24dp">

<EditText

android:id="@+id/editText1"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter Number 1"

android:inputType="number" />

<EditText

android:id="@+id/editText2"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Enter Number 2"

android:inputType="number"

android:layout\_below="@id/editText1"

android:layout\_marginTop="16dp" />

<Button

android:id="@+id/button1"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Add Numbers"

android:layout\_below="@id/editText2"

android:layout\_marginTop="24dp"/>

</RelativeLayout>

**Output:**

****

**Main\_Activity.java:**

package com.padma.myapplication4;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

private EditText editText;

private StringBuilder input;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

editText = findViewById(R.id.editTextText);

input = new StringBuilder();

int[] buttonIds = {

R.id.button7, R.id.button8, R.id.button9, R.id.button10,

R.id.button11, R.id.button12, R.id.button13, R.id.button15,

R.id.button16, R.id.button17, R.id.button18, R.id.button19,

R.id.button20, R.id.button21, R.id.button22, R.id.button23

};

for (int id : buttonIds) {

Button button = findViewById(id);

button.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View v) {

String text = ((Button) v).getText().toString();

if (text.equals("=")) {

calculateResult();

} else {

input.append(text);

editText.setText(input.toString());

}

}

});

}

}

private void calculateResult() {

try {

double result = eval(input.toString());

editText.setText(String.valueOf(result));

input.setLength(0);

} catch (Exception e) {

editText.setText("Error");

input.setLength(0);

}

}

private double eval(String expression) {

return new Object() {

int pos = -1, ch;

void nextChar() {

ch = (++pos < expression.length()) ? expression.charAt(pos) : -1;

}

boolean potta (int charToEat) {

while (ch == ' ') nextChar();

if (ch == charToEat) {

nextChar();

return true;

}

return false;

}

double parse() {

nextChar();

double x = parseExpression();

if (pos < expression.length()) throw new RuntimeException("Unexpected: " + (char) ch);

return x;

}

double parseExpression() {

double x = parseTerm();

while (true) {

if (potta('+')) x += parseTerm();

else if (potta('-')) x -= parseTerm();

else return x;

}

}

double parseTerm() {

double x = parseFactor();

while (true) {

if (potta('\*')) x \*= parseFactor();

else if (potta('/')) x /= parseFactor();

else return x;

}

}

double parseFactor() {

if (potta('+')) return parseFactor();

if (potta('-')) return -parseFactor();

double x;

int startPos = this.pos;

if ((ch >= '0' && ch <= '9') || ch == '.') {

while ((ch >= '0' && ch <= '9') || ch == '.') nextChar();

x = Double.parseDouble(expression.substring(startPos, this.pos));

} else {

throw new RuntimeException("Unexpected: " + (char) ch);

}

return x;

}

}.parse();

}

}

**Activity.xml:**

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout 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:id="@+id/main"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

tools:context=".MainActivity">

<TextView

android:id="@+id/textView"

android:layout\_width="106dp"

android:layout\_height="21dp"

android:layout\_marginTop="50dp"

android:text="Native calculator"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintHorizontal\_bias="0.5"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<EditText

android:id="@+id/editTextText"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="16dp"

android:layout\_marginBottom="7dp"

android:ems="10"

android:inputType="text"

android:text="Enter the number:"

app:layout\_constraintBottom\_toTopOf="@+id/button7"

app:layout\_constraintStart\_toStartOf="parent" />

<Button

android:id="@+id/button"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginEnd="11dp"

android:layout\_marginBottom="9dp"

android:text="calculate"

app:layout\_constraintBottom\_toTopOf="@+id/button9"

app:layout\_constraintEnd\_toEndOf="parent" />

<Button

android:id="@+id/button7"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="7dp"

android:layout\_marginTop="155dp"

android:text="1"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintTop\_toTopOf="parent" />

<Button

android:id="@+id/button8"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="10dp"

android:layout\_marginEnd="9dp"

android:text="2"

app:layout\_constraintEnd\_toStartOf="@+id/button9"

app:layout\_constraintTop\_toBottomOf="@+id/editTextText" />

<Button

android:id="@+id/button9"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginEnd="2dp"

android:text="3"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button8"

app:layout\_constraintEnd\_toStartOf="@+id/button" />

<Button

android:id="@+id/button10"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="12dp"

android:layout\_marginEnd="10dp"

android:text="+"

app:layout\_constraintEnd\_toEndOf="parent"

app:layout\_constraintTop\_toBottomOf="@+id/button" />

<Button

android:id="@+id/button11"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="11dp"

android:text="4"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button12"

app:layout\_constraintStart\_toStartOf="parent" />

<Button

android:id="@+id/button12"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="8dp"

android:text="5"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button13"

app:layout\_constraintStart\_toStartOf="@+id/button8" />

<Button

android:id="@+id/button13"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="15dp"

android:layout\_marginEnd="6dp"

android:text="6"

app:layout\_constraintEnd\_toStartOf="@+id/button23"

app:layout\_constraintTop\_toBottomOf="@+id/button10" />

<Button

android:id="@+id/button15"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="11dp"

android:text="7"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button16"

app:layout\_constraintStart\_toStartOf="parent" />

<Button

android:id="@+id/button16"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="8dp"

android:layout\_marginTop="20dp"

android:text="8"

app:layout\_constraintStart\_toStartOf="@+id/button12"

app:layout\_constraintTop\_toBottomOf="@+id/button12" />

<Button

android:id="@+id/button17"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="20dp"

android:layout\_marginEnd="4dp"

android:text="9"

app:layout\_constraintEnd\_toStartOf="@+id/button18"

app:layout\_constraintTop\_toBottomOf="@+id/button13" />

<Button

android:id="@+id/button18"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="11dp"

android:text="\*"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button17"

app:layout\_constraintStart\_toStartOf="@+id/button23" />

<Button

android:id="@+id/button19"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="16dp"

android:text="0"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button20"

app:layout\_constraintStart\_toStartOf="parent" />

<Button

android:id="@+id/button20"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginStart="19dp"

android:text="."

app:layout\_constraintStart\_toEndOf="@+id/button19"

app:layout\_constraintTop\_toTopOf="@+id/button21" />

<Button

android:id="@+id/button21"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginTop="28dp"

android:layout\_marginEnd="2dp"

android:text="="

app:layout\_constraintEnd\_toStartOf="@+id/button22"

app:layout\_constraintTop\_toBottomOf="@+id/button17" />

<Button

android:id="@+id/button22"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="/"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button21"

app:layout\_constraintStart\_toStartOf="@+id/button18" />

<Button

android:id="@+id/button23"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_marginEnd="7dp"

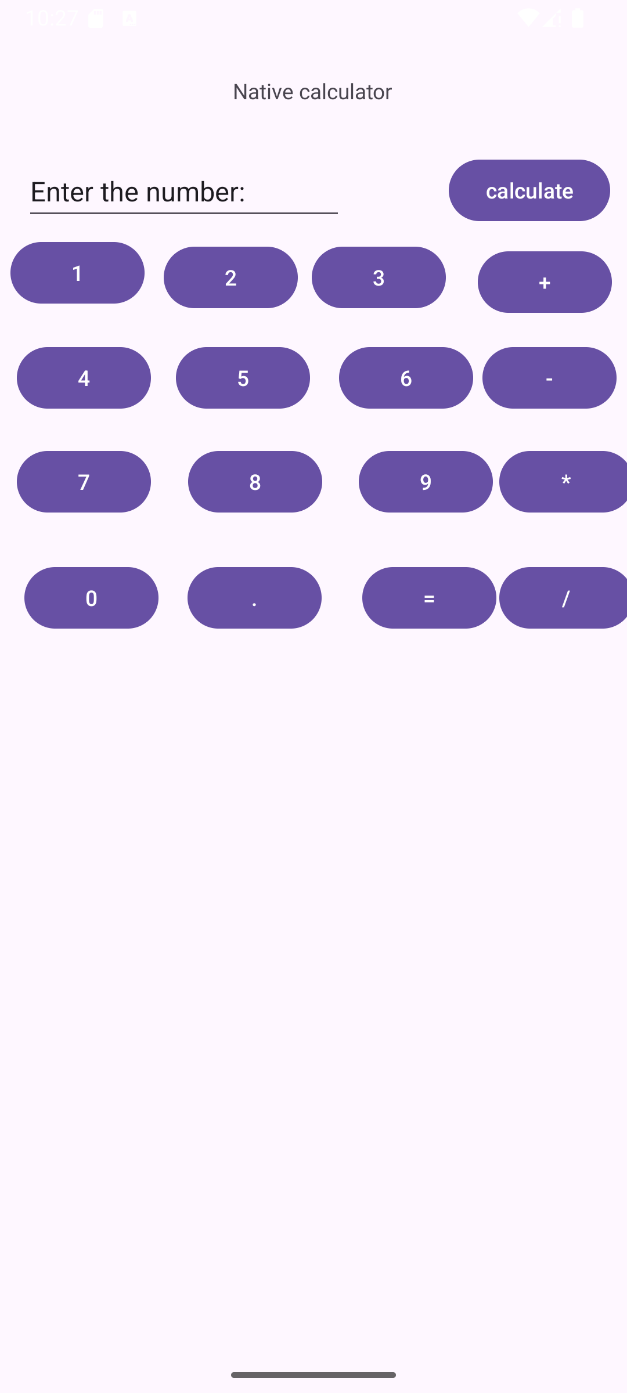
android:text="-"

app:layout\_constraintBaseline\_toBaselineOf="@+id/button13"

app:layout\_constraintEnd\_toEndOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>

**Output:**

****

**Main\_Activity.java:**

package com.example.graphics;

import android.app.Activity;

import android.content.Context;

import android.graphics.Canvas;

import android.graphics.Color;

import android.graphics.Paint;

import android.os.Bundle;

import android.view.View;

public class MainActivity extends Activity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(new MyView(this));

}

private class MyView extends View {

public MyView(Context context) {

super(context);

}

@Override

protected void onDraw(Canvas canvas) {

super.onDraw(canvas);

int canvasWidth = canvas.getWidth();

int canvasHeight = canvas.getHeight();

int rectWidth = 300;

int rectHeight = 200;

int left = (canvasWidth - rectWidth) / 2;

int top = (canvasHeight - rectHeight) / 2;

int right = left + rectWidth;

int bottom = top + rectHeight;

Paint myPaint = new Paint();

myPaint.setColor(Color.GREEN);

myPaint.setStyle(Paint.Style.STROKE);

myPaint.setStrokeWidth(5);

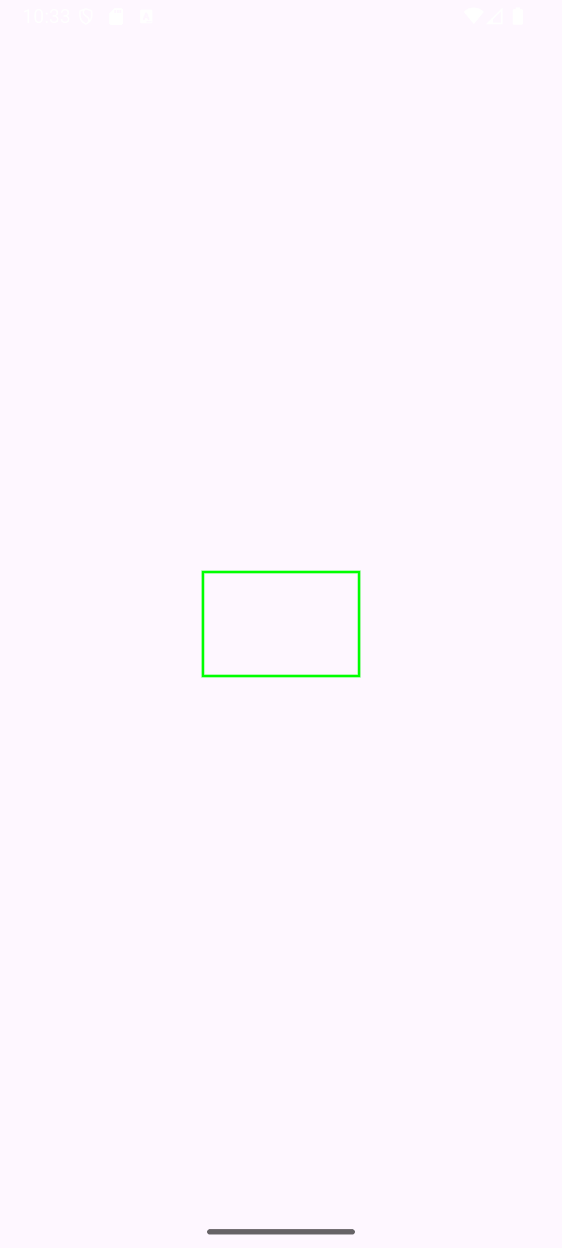
canvas.drawRect(left, top, right, bottom, myPaint);

}

}

}

**Output:**

****

**Main\_Activity.java:**

package com.example.circle;

import android.app.Activity;

import android.content.Context;

import android.graphics.Canvas;

import android.graphics.Color;

import android.graphics.Paint;

import android.os.Bundle;

import android.view.View;

public class MainActivity extends Activity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(new MyView(this));

}

private class MyView extends View {

public MyView(Context context) {

super(context);

}

@Override

protected void onDraw(Canvas canvas) {

super.onDraw(canvas);

int canvasWidth = canvas.getWidth();

int canvasHeight = canvas.getHeight();

int centerX = canvasWidth / 2;

int centerY = canvasHeight / 2;

int radius = 150; // Radius of the circle

Paint paint = new Paint();

paint.setAntiAlias(true); // Smooth edges

paint.setStyle(Paint.Style.FILL); // Fill the circle

paint.setColor(Color.parseColor("#00FF00")); // Bright green

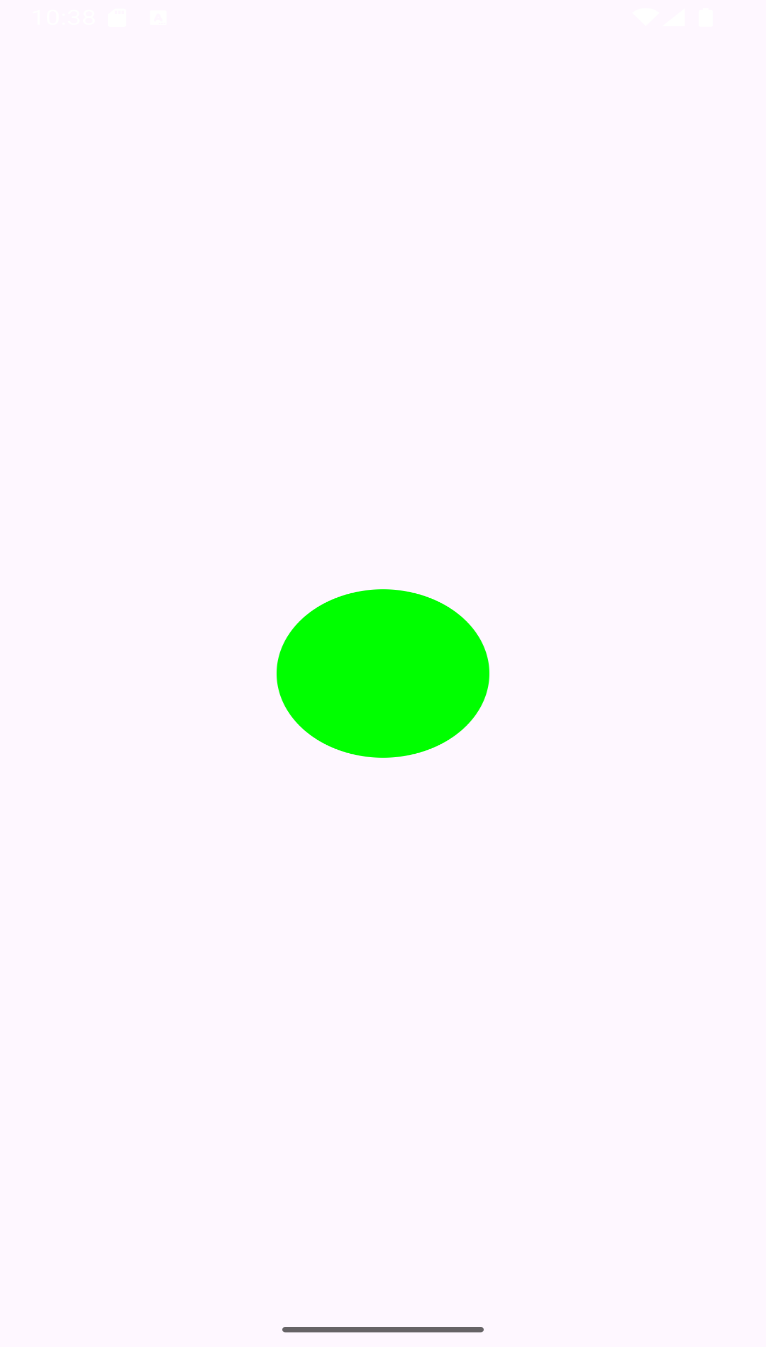
canvas.drawCircle(centerX, centerY, radius, paint);

}

}

}

**Output:**

****

**Main\_Activity.java:**

package com.example.databaseapp;

import android.app.Activity;

import android.app.AlertDialog;

import android.content.Context;

import android.database.Cursor;

import android.database.sqlite.SQLiteDatabase;

import android.os.Bundle;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

public class MainActivity extends Activity {

EditText Rollno, Name, Marks;

Button Insert, Delete, Update, View, ViewAll;

SQLiteDatabase db;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

// Initialize Views

Rollno = findViewById(R.id.Rollno);

Name = findViewById(R.id.Name);

Marks = findViewById(R.id.Marks);

Insert = findViewById(R.id.Insert);

Delete = findViewById(R.id.Delete);

Update = findViewById(R.id.Update);

View = findViewById(R.id.View);

ViewAll = findViewById(R.id.ViewAll);

// Create database and table

db = openOrCreateDatabase("StudentDB", Context.MODE\_PRIVATE, null);

db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno VARCHAR, name VARCHAR, marks VARCHAR);");

// Set Click Listeners

Insert.setOnClickListener(v -> executeDbOperation("insert"));

Delete.setOnClickListener(v -> executeDbOperation("delete"));

Update.setOnClickListener(v -> executeDbOperation("update"));

View.setOnClickListener(v -> executeDbOperation("view"));

ViewAll.setOnClickListener(v -> executeDbOperation("view\_all"));

}

private void executeDbOperation(String operation) {

String rollno = Rollno.getText().toString();

String name = Name.getText().toString();

String marks = Marks.getText().toString();

switch (operation) {

case "insert":

if (isEmpty(rollno, name, marks)) {

showMessage("Error", "Please fill all fields");

return;

}

db.execSQL("INSERT INTO student VALUES('" + rollno + "', '" + name + "', '" + marks + "');");

showMessage("Success", "Record Inserted");

break;

case "delete":

if (rollno.isEmpty()) {

showMessage("Error", "Please enter Rollno");

return;

}

Cursor c = db.rawQuery("SELECT \* FROM student WHERE rollno='" + rollno + "'", null);

if (c.moveToFirst()) {

db.execSQL("DELETE FROM student WHERE rollno='" + rollno + "'");

showMessage("Success", "Record Deleted");

} else {

showMessage("Error", "Invalid Rollno");

}

break;

case "update":

if (isEmpty(rollno, name, marks)) {

showMessage("Error", "Please fill all fields");

return;

}

c = db.rawQuery("SELECT \* FROM student WHERE rollno='" + rollno + "'", null);

if (c.moveToFirst()) {

db.execSQL("UPDATE student SET name='" + name + "', marks='" + marks + "' WHERE rollno='" + rollno + "'");

showMessage("Success", "Record Updated");

} else {

showMessage("Error", "Invalid Rollno");

}

break;

case "view":

if (rollno.isEmpty()) {

showMessage("Error", "Please enter Rollno");

return;

}

c = db.rawQuery("SELECT \* FROM student WHERE rollno='" + rollno + "'", null);

if (c.moveToFirst()) {

Name.setText(c.getString(1));

Marks.setText(c.getString(2));

} else {

showMessage("Error", "Invalid Rollno");

clearText();

}

break;

case "view\_all":

c = db.rawQuery("SELECT \* FROM student", null);

if (c.getCount() == 0) {

showMessage("Error", "No records found");

return;

}

StringBuilder buffer = new StringBuilder();

while (c.moveToNext()) {

buffer.append("Rollno: ").append(c.getString(0)).append("\n")

.append("Name: ").append(c.getString(1)).append("\n")

.append("Marks: ").append(c.getString(2)).append("\n\n");

}

showMessage("Student Details", buffer.toString());

break;

}

clearText();

}

private boolean isEmpty(String rollno, String name, String marks) {

return rollno.isEmpty() || name.isEmpty() || marks.isEmpty();

}

private void showMessage(String title, String message) {

new AlertDialog.Builder(this)

.setCancelable(true)

.setTitle(title)

.setMessage(message)

.show();

}

private void clearText() {

Rollno.setText("");

Name.setText("");

Marks.setText("");

Rollno.requestFocus();

}

}

**Activity.xml:**

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="20dp">

<TextView

android:id="@+id/titleText"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Student Details"

android:textSize="24sp"

android:layout\_gravity="center" />

<TextView

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Enter Rollno:"

android:textSize="18sp" />

<EditText

android:id="@+id/Rollno"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:inputType="number" />

<TextView

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Enter Name:"

android:textSize="18sp" />

<EditText

android:id="@+id/Name"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:inputType="text" />

<TextView

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Enter Marks:"

android:textSize="18sp" />

<EditText

android:id="@+id/Marks"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:inputType="number" />

<Button

android:id="@+id/Insert"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Insert" />

<Button

android:id="@+id/Delete"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Delete" />

<Button

android:id="@+id/Update"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Update" />

<Button

android:id="@+id/View"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="View" />

<Button

android:id="@+id/ViewAll"

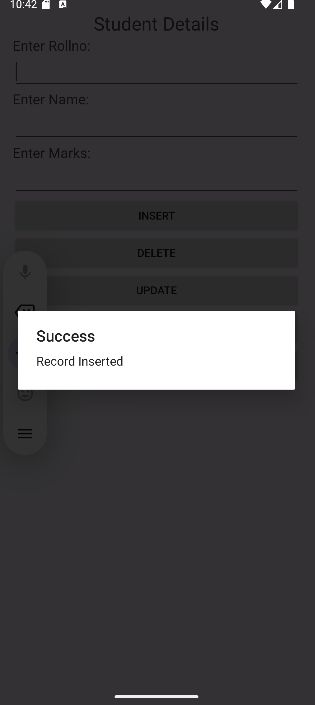
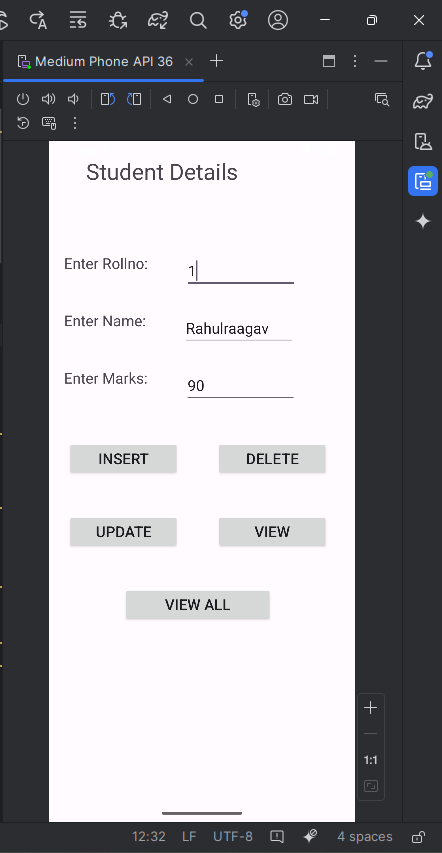
android:layout\_width="match\_parent"

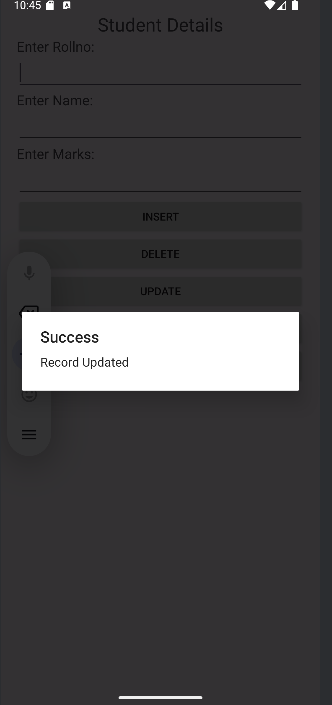
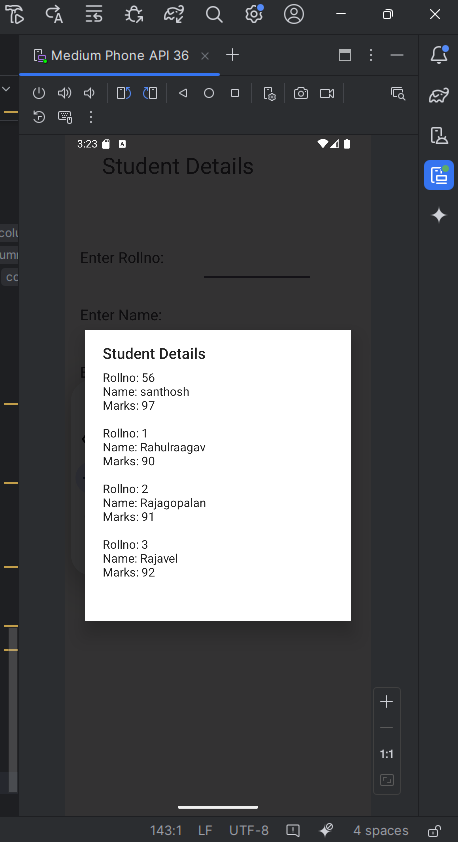
android:layout\_height="wrap\_content"

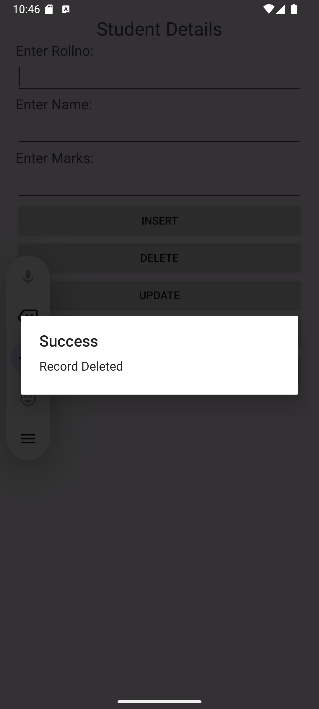
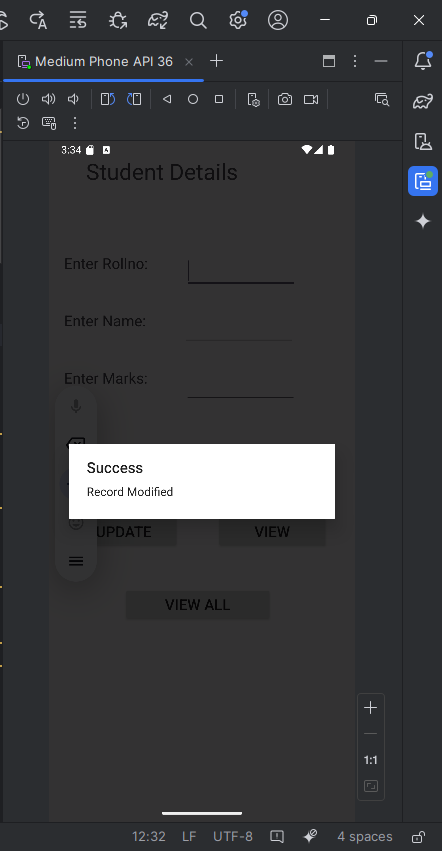
android:text="View All" />

</LinearLayout>

**Output:**

** **

** **

** **

**Android\_manifest.xml:**

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

package="com.padma.studentchatapp">

<application

android:allowBackup="true"

android:dataExtractionRules="@xml/data\_extraction\_rules"

android:fullBackupContent="@xml/backup\_rules"

android:icon="@mipmap/ic\_launcher"

android:label="@string/app\_name"

android:roundIcon="@mipmap/ic\_launcher\_round"

android:supportsRtl="true"

android:theme="@style/Theme.StudentChatApp"

tools:targetApi="31">

<!-- Set LoginActivity as launcher -->

<activity

android:name=".LoginActivity"

android:exported="true">

<intent-filter>

<action android:name="android.intent.action.MAIN" />

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

</intent-filter>

</activity>

<activity android:name=".RegisterActivity" android:exported="true" />

<activity android:name=".UserListActivity" android:exported="true" />

<activity android:name=".ChatActivity" android:exported="true" />

<activity android:name=".MainActivity" android:exported="false" />

</application>

</manifest>

**Activity\_register.xml:**

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout

xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:padding="24dp"

android:orientation="vertical"

android:gravity="center"

android:background="#FF6F6F">

<EditText

android:id="@+id/editTextEmail"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Email"

android:inputType="textEmailAddress"

android:padding="10dp"

android:background="@android:drawable/editbox\_background" />

<EditText

android:id="@+id/editTextPassword"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:hint="Password"

android:inputType="textPassword"

android:padding="10dp"

android:background="@android:drawable/editbox\_background"

android:layout\_marginTop="12dp"/>

<Button

android:id="@+id/buttonRegister"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Register"

android:layout\_marginTop="20dp"

android:background="#FF4081"

android:textColor="#FFFFFF"/>

</LinearLayout>

**Activity\_login.xml:**

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent" android:layout\_height="match\_parent"

android:padding="20dp" android:orientation="vertical">

<EditText android:id="@+id/editTextEmail"

android:hint="Email" android:inputType="textEmailAddress"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content"/>

<EditText android:id="@+id/editTextPassword"

android:hint="Password" android:inputType="textPassword"

android:layout\_width="match\_parent" android:layout\_height="wrap\_content"/>

<Button android:id="@+id/buttonLogin"

android:text="Login" android:layout\_width="match\_parent" android:layout\_height="wrap\_content"/>

<Button android:id="@+id/buttonToRegister"

android:text="Go to Register" android:layout\_width="match\_parent" android:layout\_height="wrap\_content"/>

</LinearLayout>

**Activity\_chat.xml:**

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:orientation="vertical" android:layout\_width="match\_parent"

android:layout\_height="match\_parent">

<androidx.recyclerview.widget.RecyclerView

android:id="@+id/recyclerViewMessages"

android:layout\_width="match\_parent"

android:layout\_height="0dp"

android:layout\_weight="1"

android:padding="10dp" />

<LinearLayout

android:orientation="horizontal"

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:padding="8dp">

<EditText

android:id="@+id/editTextMessage"

android:layout\_width="0dp"

android:layout\_height="wrap\_content"

android:layout\_weight="1"

android:hint="Type a message" />

<ImageButton

android:id="@+id/buttonSend"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:src="@android:drawable/ic\_menu\_send" />

</LinearLayout>

</LinearLayout>  
  
**RegisterActivity.java:**

package com.padma.studentchatapp;

import android.content.Intent;

import android.os.Bundle;

import android.widget.Button;

import android.widget.EditText;

import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import com.google.firebase.auth.FirebaseAuth;

import com.google.firebase.database.FirebaseDatabase;

public class RegisterActivity extends AppCompatActivity {

EditText editTextEmail, editTextPassword;

Button buttonRegister;

FirebaseAuth mAuth;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_register);

// Initialize Firebase Authentication

mAuth = FirebaseAuth.getInstance();

// Bind UI elements

editTextEmail = findViewById(R.id.editTextEmail);

editTextPassword = findViewById(R.id.editTextPassword);

buttonRegister = findViewById(R.id.buttonRegister);

// Register button click listener

buttonRegister.setOnClickListener(view -> {

String email = editTextEmail.getText().toString().trim();

String password = editTextPassword.getText().toString().trim();

// Basic input validation

if (email.isEmpty() || password.isEmpty()) {

Toast.makeText(this, "Email and Password cannot be empty", Toast.LENGTH\_SHORT).show();

return;

}

// Firebase create user

mAuth.createUserWithEmailAndPassword(email, password)

.addOnCompleteListener(task -> {

if (task.isSuccessful()) {

// Get UID and save user to database

String uid = mAuth.getCurrentUser().getUid();

User newUser = new User(uid, email);

FirebaseDatabase.getInstance().getReference("users")

.child(uid)

.setValue(newUser)

.addOnCompleteListener(dbTask -> {

if (dbTask.isSuccessful()) {

Toast.makeText(this, "Registration Successful!", Toast.LENGTH\_SHORT).show();

// ✅ Redirect to UserListActivity

startActivity(new Intent(RegisterActivity.this, UserListActivity.class));

finish();

} else {

Toast.makeText(this, "Database Error: " + dbTask.getException().getMessage(), Toast.LENGTH\_LONG).show();

}

});

} else {

Toast.makeText(this, "Error: " + task.getException().getMessage(), Toast.LENGTH\_LONG).show();

}

});

});

}

}

**ChatActivity.java:**

package com.padma.studentchatapp;

import android.os.Bundle;

import android.widget.EditText;

import android.widget.ImageButton;

import androidx.annotation.NonNull;

import androidx.appcompat.app.AppCompatActivity;

import androidx.recyclerview.widget.LinearLayoutManager;

import androidx.recyclerview.widget.RecyclerView;

import com.google.firebase.auth.FirebaseAuth;

import com.google.firebase.database.\*;

import java.util.ArrayList;

import java.util.HashMap;

import java.util.List;

public class ChatActivity extends AppCompatActivity {

EditText editTextMessage;

ImageButton buttonSend;

RecyclerView recyclerViewMessages;

MessageAdapter messageAdapter;

List<Message> messageList;

String receiverId, senderId, chatRoomId;

DatabaseReference chatRef;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_chat);

editTextMessage = findViewById(R.id.editTextMessage);

buttonSend = findViewById(R.id.buttonSend);

recyclerViewMessages = findViewById(R.id.recyclerViewMessages);

receiverId = getIntent().getStringExtra("receiverId");

senderId = FirebaseAuth.getInstance().getCurrentUser().getUid();

// Create common chat room ID regardless of sender or receiver order

if (senderId.compareTo(receiverId) < 0) {

chatRoomId = senderId + "\_" + receiverId;

} else {

chatRoomId = receiverId + "\_" + senderId;

}

chatRef = FirebaseDatabase.getInstance().getReference("chats").child(chatRoomId).child("messages");

messageList = new ArrayList<>();

messageAdapter = new MessageAdapter(this, messageList, senderId);

recyclerViewMessages.setLayoutManager(new LinearLayoutManager(this));

recyclerViewMessages.setAdapter(messageAdapter);

buttonSend.setOnClickListener(v -> {

String messageText = editTextMessage.getText().toString().trim();

if (!messageText.isEmpty()) {

sendMessage(senderId, receiverId, messageText);

editTextMessage.setText("");

}

});

readMessages();

}

private void sendMessage(String sender, String receiver, String message) {

HashMap<String, String> msg = new HashMap<>();

msg.put("sender", sender);

msg.put("receiver", receiver);

msg.put("message", message);

chatRef.push().setValue(msg);

}

private void readMessages() {

chatRef.addValueEventListener(new ValueEventListener() {

@Override

public void onDataChange(@NonNull DataSnapshot snapshot) {

messageList.clear();

for (DataSnapshot dataSnapshot : snapshot.getChildren()) {

Message msg = dataSnapshot.getValue(Message.class);

messageList.add(msg);

}

messageAdapter.notifyDataSetChanged();

recyclerViewMessages.scrollToPosition(messageList.size() - 1);

}

@Override

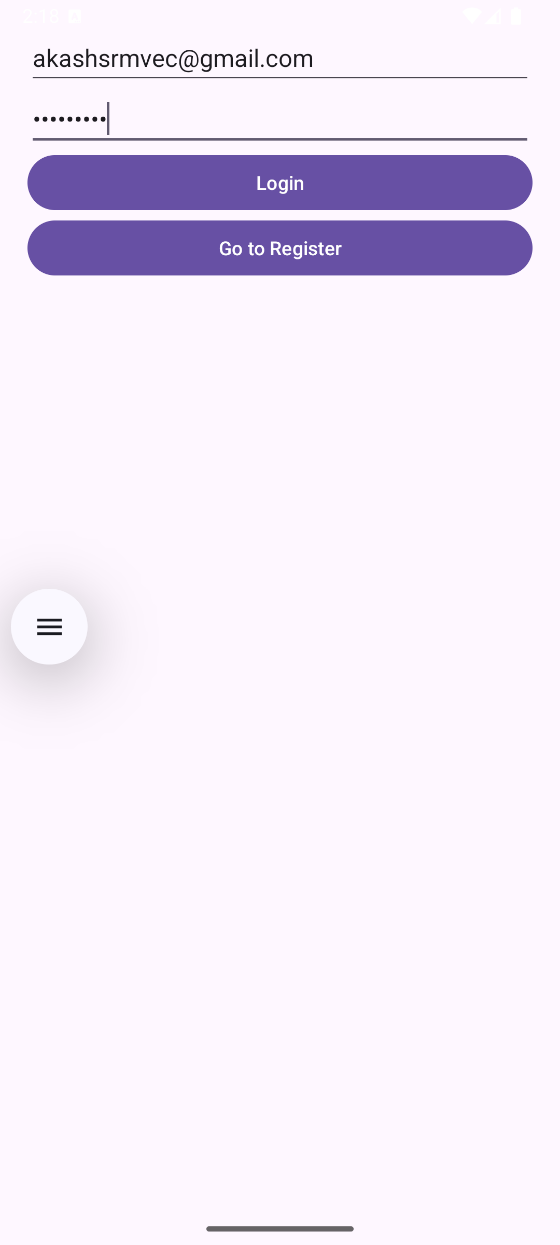
public void onCancelled(@NonNull DatabaseError error) {

}

});

}

}

**OUTPUT:**  

**Android manifest.xml**

<?xml version="1.0" encoding="utf-8"?>

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

package="com.example.ex8"> <!-- Change this to match your actual package name -->

<!-- Permissions for reading/writing to external storage -->

<uses-permission android:name="android.permission.WRITE\_EXTERNAL\_STORAGE" />

<uses-permission android:name="android.permission.READ\_EXTERNAL\_STORAGE" />

<application

android:allowBackup="true"

android:dataExtractionRules="@xml/data\_extraction\_rules"

android:fullBackupContent="@xml/backup\_rules"

android:icon="@mipmap/ic\_launcher"

android:label="@string/app\_name"

android:roundIcon="@mipmap/ic\_launcher\_round"

android:supportsRtl="true"

android:theme="@style/Theme.Ex8"

tools:targetApi="31">

<activity

android:name=".MainActivity"

android:exported="true">

<intent-filter>

<action android:name="android.intent.action.MAIN" />

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

</intent-filter>

</activity>

</application>

</manifest>

**ActivityMain.xml**

<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:paddingBottom="16dp"

android:paddingLeft="16dp"

android:paddingRight="16dp"

android:paddingTop="16dp"

tools:context=".MainActivity">

<TextView

android:id="@+id/textView1"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Saved Data Will Appear Here" />

<EditText

android:id="@+id/editText1"

android:layout\_width="200dp"

android:layout\_height="wrap\_content"

android:layout\_above="@id/button1"

android:layout\_toRightOf="@id/textView1"

android:layout\_marginBottom="50dp"

android:hint="Enter data"

android:ems="10" >

<requestFocus />

</EditText>

<Button

android:id="@+id/button1"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_alignLeft="@+id/textView1"

android:layout\_centerVertical="true"

android:layout\_marginLeft="32dp"

android:text="Save Data" />

<Button

android:id="@+id/button2"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_toRightOf="@id/button1"

android:layout\_centerVertical="true"

android:layout\_marginLeft="36dp"

android:text="Show Data" />

</RelativeLayout>

**MainActivity.java**

package com.example.My Application8;

import android.Manifest;

import android.app.Activity;

import android.content.pm.PackageManager;

import android.os.Bundle;

import android.os.Environment;

import android.view.View;

import android.widget.Button;

import android.widget.EditText;

import android.widget.TextView;

import android.widget.Toast;

import androidx.core.app.ActivityCompat;

import androidx.core.content.ContextCompat;

import java.io.File;

import java.io.FileInputStream;

import java.io.FileOutputStream;

import java.io.IOException;

public class MainActivity extends Activity {

Button b1, b2;

EditText e;

TextView tv;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

tv = findViewById(R.id.textView1);

b1 = findViewById(R.id.button1);

b2 = findViewById(R.id.button2);

e = findViewById(R.id.editText1);

// Request storage permissions at runtime

if (ContextCompat.checkSelfPermission(this, Manifest.permission.WRITE\_EXTERNAL\_STORAGE)

!= PackageManager.PERMISSION\_GRANTED) {

ActivityCompat.requestPermissions(this,

new String[]{Manifest.permission.WRITE\_EXTERNAL\_STORAGE}, 1);

}

// Save data to SD card

b1.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View view) {

String text = e.getText().toString();

if (isExternalStorageWritable()) {

File file = new File(getExternalFilesDir(null), "myfile.txt");

try (FileOutputStream fos = new FileOutputStream(file, true)) {

fos.write((text + "\n").getBytes());

Toast.makeText(getApplicationContext(), "Data saved to SD card", Toast.LENGTH\_SHORT).show();

e.setText(""); // Clear after saving

} catch (IOException ex) {

Toast.makeText(getApplicationContext(), "Save failed", Toast.LENGTH\_SHORT).show();

ex.printStackTrace();

}

}

}

});

// Show data from SD card

b2.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View view) {

File file = new File(getExternalFilesDir(null), "myfile.txt");

if (isExternalStorageReadable()) {

try (FileInputStream fis = new FileInputStream(file)) {

int ch;

StringBuilder builder = new StringBuilder();

while ((ch = fis.read()) != -1) {

builder.append((char) ch);

}

tv.setText(builder.toString());

Toast.makeText(getApplicationContext(), "File read", Toast.LENGTH\_SHORT).show();

} catch (IOException ex) {

Toast.makeText(getApplicationContext(), "Read failed", Toast.LENGTH\_SHORT).show();

ex.printStackTrace();

}

}

}

});

}

private boolean isExternalStorageWritable() {

return Environment.MEDIA\_MOUNTED.equals(Environment.getExternalStorageState());

}

private boolean isExternalStorageReadable() {

String state = Environment.getExternalStorageState();

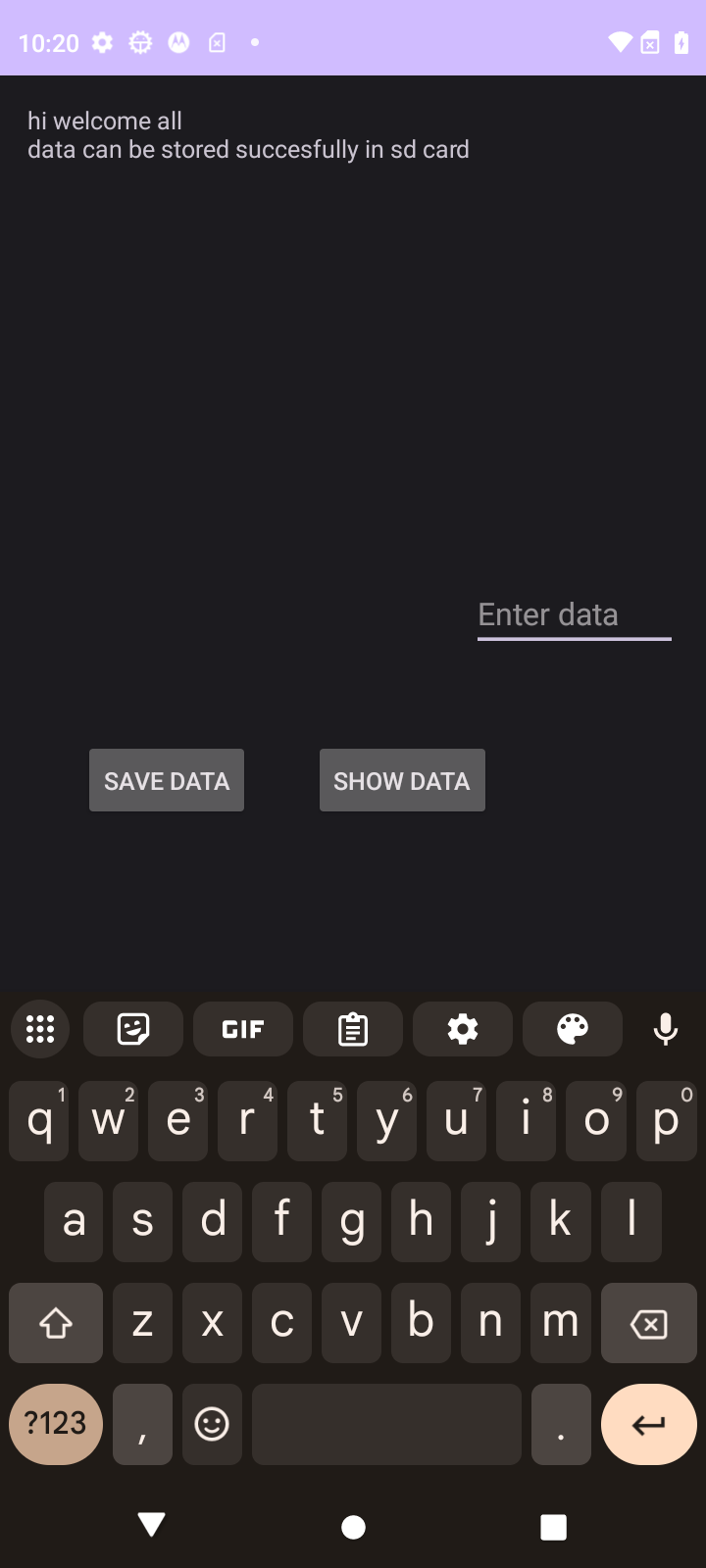
return Environment.MEDIA\_MOUNTED.equals(state) ||

Environment.MEDIA\_MOUNTED\_READ\_ONLY.equals(state);

}

}

**OUTPUT:**



**Android Manifest.xml:**

<?xml version="1.0" encoding="utf-8"?>

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

package="com.example.gpstrackingapp">

<uses-permission android:name="android.permission.ACCESS\_FINE\_LOCATION"/>

<uses-permission android:name="android.permission.ACCESS\_COARSE\_LOCATION"/>

<uses-permission android:name="android.permission.INTERNET" />

<application

android:allowBackup="true"

android:dataExtractionRules="@xml/data\_extraction\_rules"

android:fullBackupContent="@xml/backup\_rules"

android:icon="@mipmap/ic\_launcher"

android:label="@string/app\_name"

android:roundIcon="@mipmap/ic\_launcher\_round"

android:supportsRtl="true"

android:theme="@style/Theme.GPSTrackingApp"

tools:targetApi="31">

<activity

android:name=".MainActivity"

android:exported="true">

<intent-filter>

<action android:name="android.intent.action.MAIN" />

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

</intent-filter>

</activity> </application>

**Activity\_main.xml:**

<?xml version="1.0" encoding="utf-8"?>

<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="20dp"

android:gravity="center">

<Button

android:id="@+id/btnShowLocation"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Show My Location"/>

</LinearLayout>

**Main Activity.java:**

package com.example.gpstrackingapp;

import android.Manifest;

import android.content.pm.PackageManager;

import android.location.Location;

import android.os.Bundle;

import android.widget.Button;

import android.widget.Toast;

import androidx.annotation.NonNull;

import androidx.appcompat.app.AppCompatActivity;

import androidx.core.app.ActivityCompat;

import com.google.android.gms.location.FusedLocationProviderClient;

import com.google.android.gms.location.LocationServices;

import com.google.android.gms.tasks.OnSuccessListener;

public class MainActivity extends AppCompatActivity {

Button btnShowLocation;

FusedLocationProviderClient fusedLocationClient;

private static final int LOCATION\_PERMISSION\_CODE = 101;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

btnShowLocation = findViewById(R.id.btnShowLocation);

fusedLocationClient = LocationServices.getFusedLocationProviderClient(this);

btnShowLocation.setOnClickListener(view -> {

if (ActivityCompat.checkSelfPermission(this, Manifest.permission.ACCESS\_FINE\_LOCATION) != PackageManager.PERMISSION\_GRANTED) {

ActivityCompat.requestPermissions(this, new String[]{Manifest.permission.ACCESS\_FINE\_LOCATION}, LOCATION\_PERMISSION\_CODE);

} else {

getLastLocation();

}

});

}

private void getLastLocation() {

fusedLocationClient.getLastLocation()

.addOnSuccessListener(this, location -> {

if (location != null) {

double lat = location.getLatitude();

double lon = location.getLongitude();

Toast.makeText(getApplicationContext(),

"Latitude: " + lat + "\nLongitude: " + lon,

Toast.LENGTH\_LONG).show();

} else {

Toast.makeText(getApplicationContext(), "Location not available", Toast.LENGTH\_SHORT).show();

}

});

}

// Handle permission result

@Override

public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,

@NonNull int[] grantResults) {

super.onRequestPermissionsResult(requestCode, permissions, grantResults);

if (requestCode == LOCATION\_PERMISSION\_CODE) {

if (grantResults.length > 0 && grantResults[0] == PackageManager.PERMISSION\_GRANTED) {

getLastLocation();

} else {

Toast.makeText(this, "Permission denied", Toast.LENGTH\_SHORT).show();

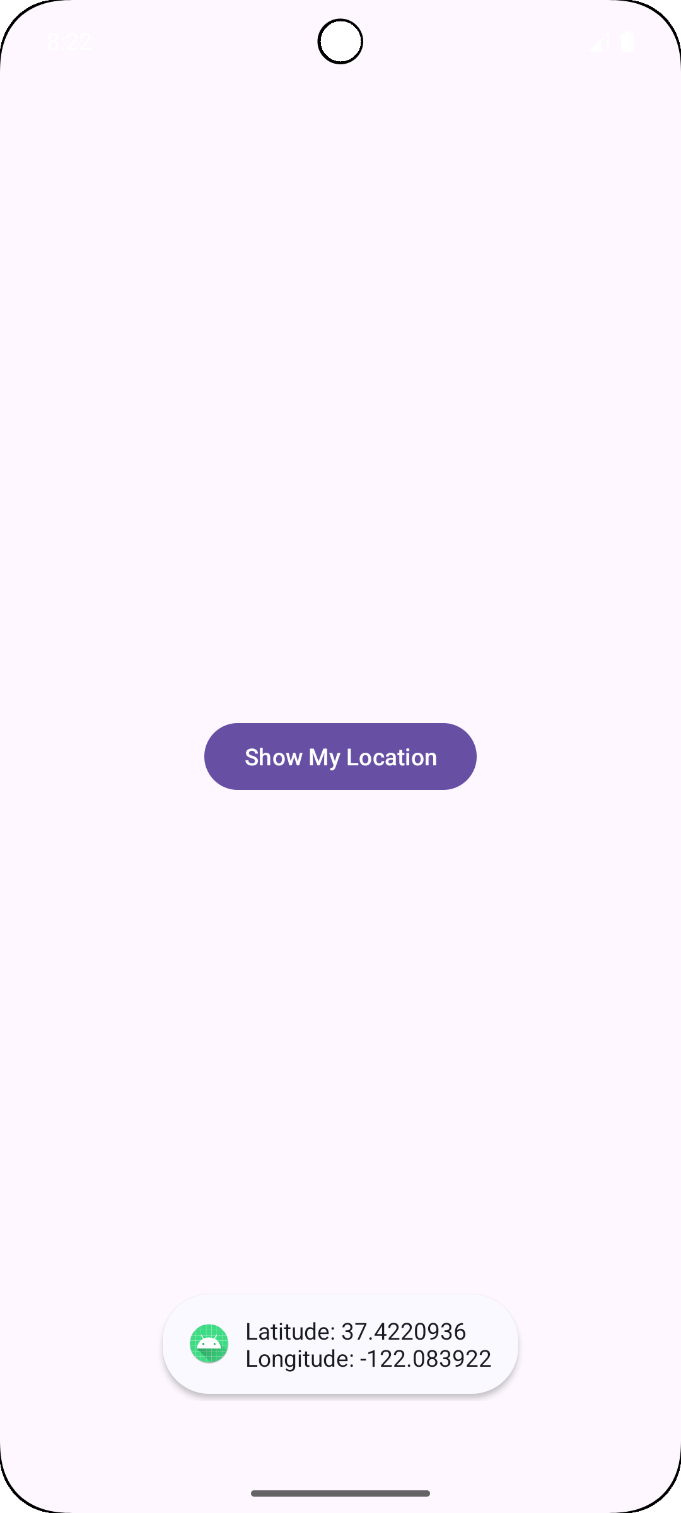
}

}

}

}

**OUTPUT:**



**Activity.xml:**

<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout

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:id="@+id/main"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

tools:context=".MainActivity">

<!-- Drag & Drop UI -->

<LinearLayout

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="horizontal"

app:layout\_constraintTop\_toTopOf="parent"

app:layout\_constraintBottom\_toBottomOf="parent"

app:layout\_constraintStart\_toStartOf="parent"

app:layout\_constraintEnd\_toEndOf="parent">

<!-- Draggable Emoji -->

<TextView

android:id="@+id/emoji1"

android:layout\_width="100dp"

android:layout\_height="100dp"

android:text="🍏"

android:textSize="30sp"

android:layout\_gravity="center\_vertical"

android:layout\_marginStart="20dp"/>

<!-- Drop Target -->

<TextView

android:id="@+id/target1"

android:layout\_width="200dp"

android:layout\_height="100dp"

android:background="#4CAF50"

android:text="Drop Here"

android:layout\_gravity="center\_vertical"

android:layout\_marginStart="40dp"

android:gravity="center"/>

</LinearLayout>

</androidx.constraintlayout.widget.ConstraintLayout>

**MainActivity.java:**

package com.example.dragdrop;

import android.os.Bundle;

import android.view.DragEvent;

import android.view.View;

import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

// Set drag listeners

findViewById(R.id.emoji1).setOnLongClickListener(v -> {

View.DragShadowBuilder shadow = new View.DragShadowBuilder(v);

v.startDragAndDrop(null, shadow, v, 0);

return true;

});

findViewById(R.id.target1).setOnDragListener((v, event) -> {

if (event.getAction() == DragEvent.ACTION\_DROP) {

TextView dropped = (TextView) event.getLocalState();

TextView target = (TextView) v;

target.setText("Correct!");

}

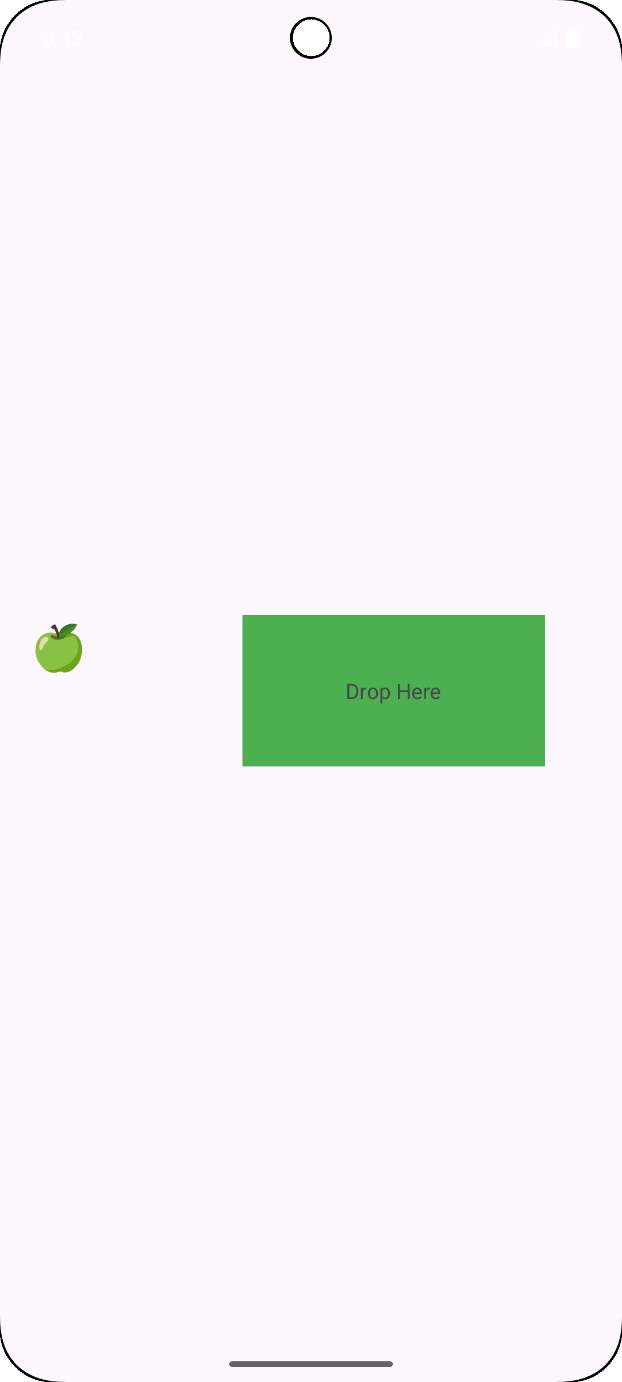
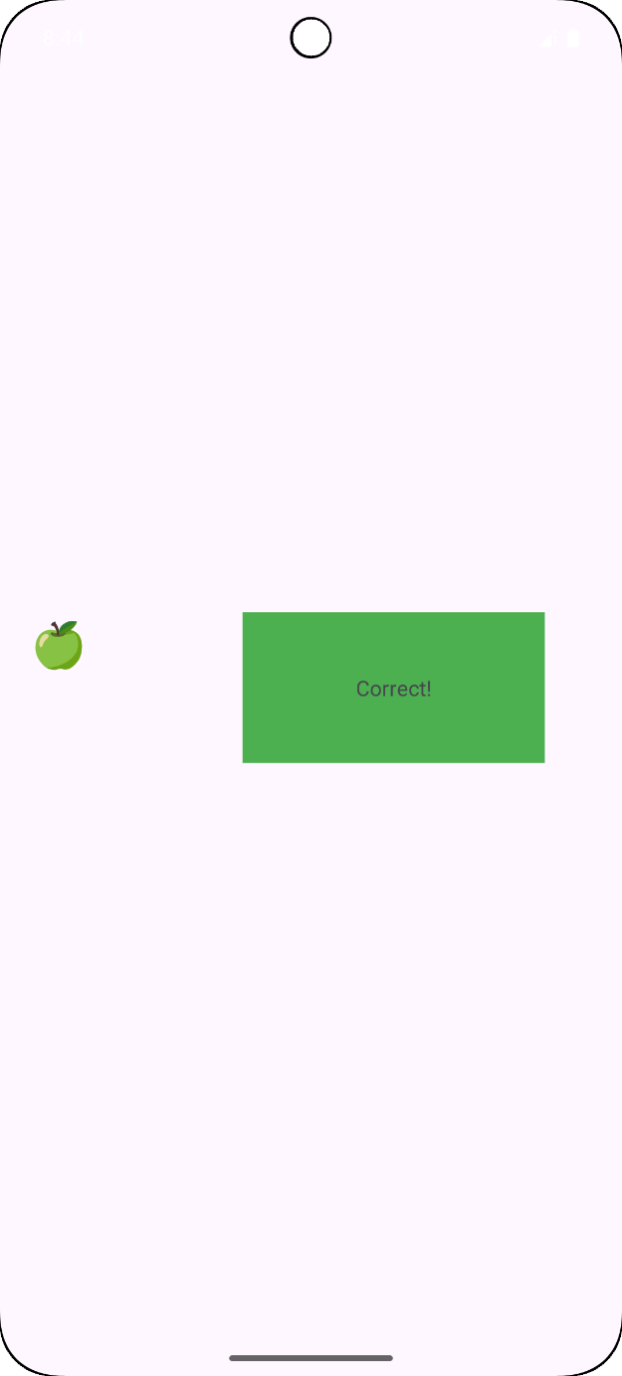
return true;

});

}

}

**OUTPUT:**

**Main\_activity.java:**

package com.example.alarmclock;

import android.app.AlarmManager;

import android.app.PendingIntent;

import android.content.Intent;

import android.os.Bundle;

import android.widget.TextView;

import android.widget.TimePicker;

import android.widget.ToggleButton;

import android.view.View;

import androidx.appcompat.app.AppCompatActivity;

import java.util.Calendar;

public class MainActivity extends AppCompatActivity {

private AlarmManager alarmManager;

private PendingIntent pendingIntent;

private TimePicker alarmTimePicker;

private TextView alarmText;

@Override

protected void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

setContentView(R.layout.activity\_main);

alarmTimePicker = findViewById(R.id.alarmTimePicker);

alarmText = findViewById(R.id.alarmText);

alarmManager = (AlarmManager) getSystemService(ALARM\_SERVICE);

}

public void onToggleClicked(View view) {

ToggleButton toggle = (ToggleButton) view;

if (toggle.isChecked()) {

int hour = alarmTimePicker.getHour();

int minute = alarmTimePicker.getMinute();

Calendar calendar = Calendar.getInstance();

calendar.set(Calendar.HOUR\_OF\_DAY, hour);

calendar.set(Calendar.MINUTE, minute);

calendar.set(Calendar.SECOND, 0);

Intent intent = new Intent(this, AlarmReceiver.class);

pendingIntent = PendingIntent.getBroadcast(this, 0, intent, PendingIntent.FLAG\_IMMUTABLE);

alarmManager.set(AlarmManager.RTC\_WAKEUP, calendar.getTimeInMillis(), pendingIntent);

alarmText.setText("Alarm set for: " + hour + ":" + String.format("%02d", minute));

} else {

if (pendingIntent != null) {

alarmManager.cancel(pendingIntent);

}

alarmText.setText("Alarm canceled");

}

}

}

**AlarmService.java:**

package com.example.alarmclock;

import android.app.IntentService;

import android.app.NotificationManager;

import android.app.PendingIntent;

import android.content.Context;

import android.content.Intent;

import androidx.core.app.NotificationCompat;

public class AlarmService extends IntentService {

public AlarmService() {

super("AlarmService");

}

@Override

protected void onHandleIntent(Intent intent) {

sendNotification("Wake Up! Alarm is ringing!");

}

private void sendNotification(String msg) {

NotificationManager manager = (NotificationManager) getSystemService(Context.NOTIFICATION\_SERVICE);

Intent intent = new Intent(this, MainActivity.class);

PendingIntent contentIntent = PendingIntent.getActivity(this, 0, intent, PendingIntent.FLAG\_IMMUTABLE);

NotificationCompat.Builder builder = new NotificationCompat.Builder(this, "default")

.setSmallIcon(R.drawable.ic\_launcher\_foreground)

.setContentTitle("Alarm Clock")

.setContentText(msg)

.setContentIntent(contentIntent)

.setAutoCancel(true);

manager.notify(1, builder.build());

}

}

**AlarmReceiver.java:**

package com.example.alarmclock;

import android.content.BroadcastReceiver;

import android.content.Context;

import android.content.Intent;

import android.media.Ringtone;

import android.media.RingtoneManager;

import android.net.Uri;

public class AlarmReceiver extends BroadcastReceiver {

@Override

public void onReceive(Context context, Intent intent) {

Uri alarmUri = RingtoneManager.getDefaultUri(RingtoneManager.TYPE\_ALARM);

if (alarmUri == null) {

alarmUri = RingtoneManager.getDefaultUri(RingtoneManager.TYPE\_NOTIFICATION);

}

Ringtone ringtone = RingtoneManager.getRingtone(context, alarmUri);

ringtone.play();

Intent service = new Intent(context, AlarmService.class);

context.startService(service);

}

}

**AndroidManifest.xml:**

<?xml version="1.0" encoding="utf-8"?>

<manifest xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools">

<uses-permission android:name="android.permission.WAKE\_LOCK" />

<application

android:allowBackup="true"

android:dataExtractionRules="@xml/data\_extraction\_rules"

android:fullBackupContent="@xml/backup\_rules"

android:icon="@mipmap/ic\_launcher"

android:label="@string/app\_name"

android:roundIcon="@mipmap/ic\_launcher\_round"

android:supportsRtl="true"

android:theme="@style/Theme.AlarmClock"

tools:targetApi="31">

<activity

android:name=".MainActivity"

android:exported="true">

<intent-filter>

<action android:name="android.intent.action.MAIN" />

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

</intent-filter>

</activity>

<!-- Register the broadcast receiver for alarm -->

<receiver android:name=".AlarmReceiver" />

<!-- Register the service to handle alarm notification -->

<service android:name=".AlarmService" />

</application>

</manifest>

**Activity.xml:**

<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"

xmlns:tools="http://schemas.android.com/tools"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

tools:context=".MainActivity">

<TimePicker

android:id="@+id/alarmTimePicker"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:layout\_centerHorizontal="true"

android:layout\_marginTop="50dp"/>

<ToggleButton

android:id="@+id/alarmToggle"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="Alarm On/Off"

android:onClick="onToggleClicked"

android:layout\_below="@id/alarmTimePicker"

android:layout\_centerHorizontal="true"

android:layout\_marginTop="30dp"/>

<TextView

android:id="@+id/alarmText"

android:layout\_width="wrap\_content"

android:layout\_height="wrap\_content"

android:text="No Alarm Set"

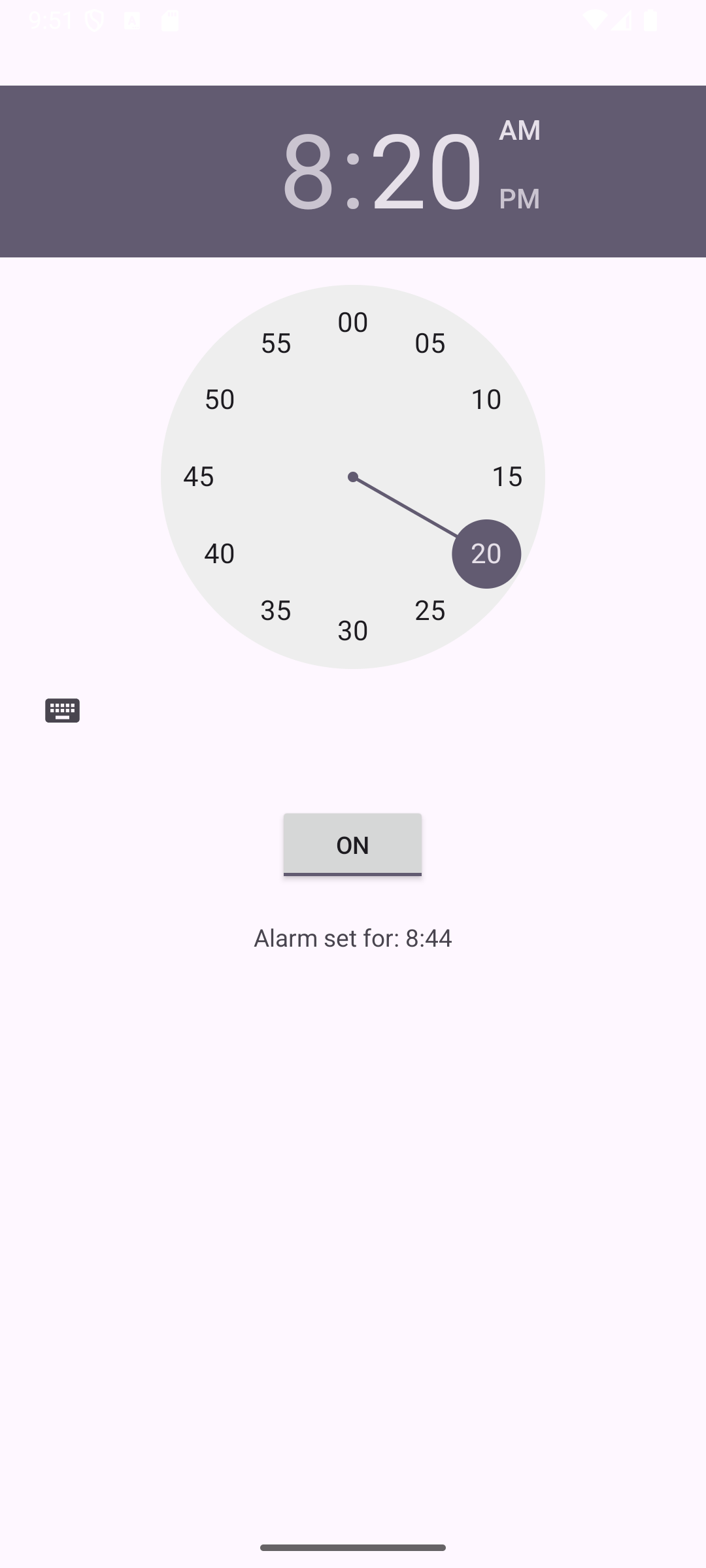
android:layout\_below="@id/alarmToggle"

android:layout\_centerHorizontal="true"

android:layout\_marginTop="20dp"/>

</RelativeLayout>

**OUTPUT:**

****