Parul University

FACULTY OF ENGINEERING AND TECHNOLOGY BACHELOR OF TECHNOLOGY

MOBILE APPLICATION DEVELOPMENT

(203105360)

6TH SEMESTER

COMPUTER SCIENCE & ENGINEERING DEPARTMENT

LABORATORY MANUAL

CERTIFICATE

This is to certify **CHAUHAN SMITA** with Enrolment Number **210303105252** has successfully complemented his laboratory experiments in the **MOBILE APPLICATION DEVELOPMENT Laboratory (203105327)** from the department of **COMPUTER SCIENCE AND ENGINEERING** during the year **2023-2024.**

Date of Submission:..... Staff In charge:.....

Head Of Department:.....

Sr. No	Name of Experiment	Page No		Start of practical	Date of submission	Marks	Sign
		From	To				
1.	Image Switch						
2.	Activity Lifecycle Intent						
3.	Alert Sample						
4.	Rupee Convertor						
5.	Random Number Puzzle						
6.	Rotate Image						
7.	Fragment Lifecycle						
8.	Bottom Navigation Fragment						
9.	Content Menu Scrolling Text						
10.	SignUp-SignIn using Room with Shared Preferences						
11.	SignUp-SignIn using Room with SQL Dialect						
12.	Integrating third party APIs(Retrofit)						
13.	SignUp-SignIn using Firebase						
14.	Weather App						

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15.	Water Supplier App						

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Practical-1

Title: Image Switch

Description: "Image Switch" is a project that seamlessly integrates the use of intents to navigate between activities. This project emphasizes practical learning, offering two engaging activities that cover fundamental concepts.

Learning Outcomes:

1. Understanding basic UI components and layouts.
2. Implementing button click listeners and event handling.
3. Utilizing intents to navigate between different activities.
4. Loading and displaying SVG images efficiently within an activity.
5. Programmatically changing the color of SVG images.
6. Exploring and applying graphics manipulation techniques.
7. Reinforcing skills in UI development and user interaction.
8. Gaining insight into the use of color resources and handling color states.

In this Project use Two Activity

Activity 1: Switching SVG Images
In this initial activity, students will master the basics of handling SVG images while understanding the crucial role of intents in transitioning between different app functionalities. By utilizing a single activity, students will learn to structure and organize code effectively, all while gaining insight into the seamless integration of intents for a smooth transition between image-switching actions.

Activity 2: Dynamic Color Change
Moving on to the second activity, students will further enhance their skills by dynamically changing the color of a single SVG image. Through this exercise, they will solidify their understanding of intents and learn to use them for smooth transitions between activities, enabling a seamless shift from image-switching to color manipulation.

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Code:

MainActivity.java

```
package com.example.myapp;

import androidx.annotation.DrawableRes; import
androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; import android.view.View;
import android.widget.Button; import
android.widget.ImageView;

public class MainActivity extends AppCompatActivity {
   ImageView imageView;
   Button button;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main); imageView =
      findViewById(R.id.imageView2); button =
      findViewById(R.id.button);
      setImageResource(R.drawable.baseline_light_mode_24)
      ; button.setOnClickListener(new View.OnClickListener() {
         @Override
         public void onClick(View v) {
            switchImg();
         }
      });
   }
   private void switchImg(){
      @DrawableRes int currentImg = (int)imageView.getTag();
      int newImg =
(currentImg==R.drawable.baseline_light_mode_24)?R.drawable.baseline_dark_mo
d e_24:R.drawable.baseline_light_mode_24; setImageResource(newImg);
   }
   private void setImageResource(@DrawableRes int resourceId){
      imageView.setImageResource(resourceId);
      imageView.setTag(resourceId);//Tag -> additional info about resources
   }
```

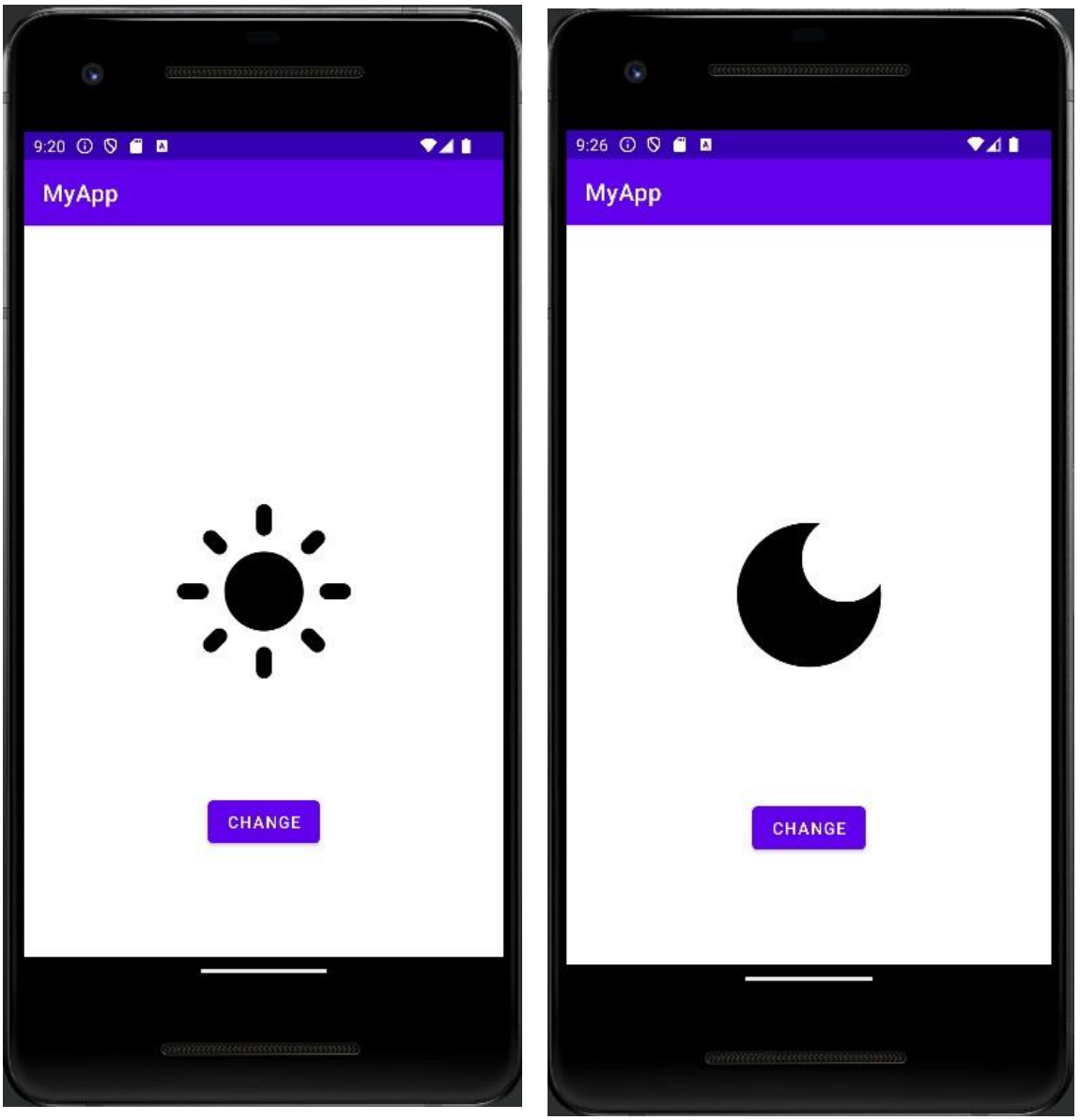
```
}
```

Activity_main.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:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">

   <ImageView android:id="@+id/imageView2"
      android:layout_width="165dp"
      android:layout_height="163dp"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:layout_marginEnd="8dp"
      android:layout_marginBottom="8dp"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:srcCompat="@drawable/android" />

   <Button android:id="@+id/button"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:layout_marginEnd="8dp"
      android:layout_marginBottom="8dp"
      android:text="@string/btn_name"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
```

```
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/imageView2" />

    </androidx.constraintlayout.widget.ConstraintLayout>
```

Output:



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Practical-2

Title: ActivityLifeCycle Intent

This project focuses on demonstrating Activity Lifecycle, various types of Intents, and the importance of logging, covering each aspect with clarity and practical examples.

Activity Lifecycle Demonstration:
The project begins with a thorough exploration of the Android Activity Lifecycle. Students will gain a deep understanding of the various stages an activity goes through, from creation to destruction. Through practical implementation, they'll witness firsthand how an Android app responds to user interactions and system events.

Learning Outcomes:

1. Understanding the key stages of the Android Activity Lifecycle.
2. Implementing lifecycle callback methods for various scenarios.
3. Gaining insights into the importance of managing resources during the activity lifecycle.
4. Debugging and troubleshooting common issues related to activity lifecycle transitions.
5. Types of Intent and Their Use:
6. The project goes beyond just activity lifecycle management, diving into the realm of Intents. Students will explore the different types of Intents – explicit and implicit – and learn how to utilize them effectively. Practical examples will illustrate how to initiate activities, transfer data between components, and invoke functionalities from other apps.

Learning Outcomes:

1. Differentiating between explicit and implicit Intents.
2. Implementing Intent objects to launch activities and services.
3. Understanding the role of Intents in inter-component communication.
4. Handling data transfer between activities using Intent extras.
5. Logging and Its Levels:
6. To ensure a robust understanding of app behavior and facilitate effective debugging, students will be introduced to logging. The project covers the various logging levels available in Android (e.g., DEBUG, INFO, ERROR) and demonstrates their usage

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within the app. By logging essential information at strategic points, students will learn to monitor and analyze the flow of their application.

Code:

FirstActivity.java package com.anirudha.activitylifecycle_intent;

```
import androidx.activity.result.ActivityResultLauncher; import
androidx.activity.result.contract.ActivityResultContracts;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle; import
android.util.Log; import
android.view.View; import
android.widget.ImageButton;

public class FirstActivity extends AppCompatActivity {
  ImageButton imageButton1;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_first);
    imageButton1 = findViewById(R.id.imageButton1);
    startSecondActivity();
  }
  private final ActivityResultLauncher<Intent> secondActivityLauncher =
registerForActivityResult( new
      ActivityResultContracts.StartActivityForResult(),
      result -> {
        if (result.getResultCode() == RESULT_OK)
          { Intent data = result.getData(); if (data
          != null) {
            String messageFromSecondActivity =
data.getStringExtra("FROM_SECOND_ACTIVITY"); if
(messageFromSecondActivity != null) {
              Log.i("Msg from Activity2: ", messageFromSecondActivity);
            } else {
              Log.e("Error", "messageFromSecondActivity is null");
            }
          } else {
            Log.e("Error", "Data in result is null");
          }
        } else {
```

```
                Log.e("ActivityResult", "Result code is not OK");
            }
        }
    );

        private void startSecondActivity() {
        imageButton1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String dataToPass = "Hello from FirstActivity";
                Intent intent = new Intent(FirstActivity.this, SecondActivity.class);
                intent.putExtra("FROM_FIRST_ACTIVITY", dataToPass);
                secondActivityLauncher.launch(intent);
    }
  });
 }
}
```

SecondActivity.java package

```
com.anirudha.activitylifecycle_intent;

import androidx.appcompat.app.AppCompatActivity;
import android.app.Activity; import
android.content.Intent; import
android.os.Bundle; import
android.util.Log; import
android.view.View; import
android.widget.ImageButton;

public class SecondActivity extends AppCompatActivity {
  ImageButton imageButton2,imageButton3;

  @Override protected void onCreate(Bundle
  savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_second);
    imageButton2 = findViewById(R.id.imageButton2);
    imageButton3 = findViewById(R.id.imageButton3);
    startFirstActivity();
    startThiredActivity();
    Intent intentFromFirstActivity = getIntent();
    if (intentFromFirstActivity != null) {
```


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6B30

```
        String messageFromFirstActivity =
intentFromFirstActivity.getStringExtra("FROM_FIRST_ACTIVITY");
if (messageFromFirstActivity != null) {
            Log.i("Msg from Activity1: ", messageFromFirstActivity);
        } else {
            Log.e("Error", "messageFromFirstActivity is null");
        }
    } else {
        Log.e("Error", "intentFromFirstActivity is null");
    }
  }

  private void startFirstActivity() {
    imageButton2.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) { Intent
        resultIntent = new Intent();
        resultIntent.putExtra("FROM_SECOND_ACTIVITY", "Hello from
        SecondActivity"); setResult(Activity.RESULT_OK, resultIntent); finish();
      }
    });
  }

  private void startThiredActivity() {
    imageButton3.setOnClickListener(new View.OnClickListener() {
      @Override
      public void onClick(View v) {
        // Create an Intent to start ThiredActivity
        finish();
        startActivity(new Intent(getApplicationContext(), ThiredActivity.class));
      }
    });
  }
}
```

ThirdActivity.java package

```
com.anirudha.activitylifecycle_intent;

import android.os.Bundle;
import android.os.Handler;
import android.os.Looper;
import android.util.Log; import
```

```
android.view.View; import
android.widget.Button; import
android.widget.TextView;
import android.content.Intent;
import android.net.Uri;

import androidx.annotation.Nullable; import

androidx.appcompat.app.AppCompatActivity; public

class ThiredActivity extends AppCompatActivity {

private static final String TAG = "ThiredActivity";

  private TextView timerTextView;
  private int seconds = 0; private
  Handler handler;

  Button btn4;

  @Override
  protected void onCreate(@Nullable Bundle savedInstanceState) {
  super.onCreate(savedInstanceState);
  setContentView(R.layout.activity_thired);
  btn4=findViewById(R.id.button4); timerTextView =
  findViewById(R.id.timerTextView); Log.d(TAG, "onCreate");

     handler = new Handler(Looper.getMainLooper());
     startTimer();
     implicitIntent();
  }

  @Override protected
  void onStart() {
  super.onStart();
  Log.d(TAG, "onStart");
  }

  @Override protected void
  onResume() {
  super.onResume();
  Log.d(TAG, "onResume");
  }
```


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6B30

```
@Override protected void
onPause() {
super.onPause();
Log.d(TAG, "onPause");
}

@Override protected
void onStop() {
super.onStop();
Log.d(TAG, "onStop");
}

@Override protected void
onRestart() {
super.onRestart();
Log.d(TAG, "onRestart");
}

@Override protected void
onDestroy() {
super.onDestroy();
Log.d(TAG, "onDestroy");
   stopTimer();
}

private void startTimer() {
   handler.postDelayed(new Runnable() {
  @Override public
  void run() {
  seconds++;
  updateTimer();
    handler.postDelayed(this, 1000);
  }
 }, 1000); // Initial delay to start the timer immediately
}
private void updateTimer() {
  runOnUiThread(new Runnable() {
    @Override public
    void run() {
      int minutes = seconds / 60; int
      remainingSeconds = seconds % 60;
      String time = String.format("%02d:%02d", minutes, remainingSeconds);
      timerTextView.setText(time);
```

```
        }
      });
   }
   private void implicitIntent(){
      btn4.setOnClickListener(new View.OnClickListener() {
         @Override public void
         onClick(View v) {
            openWebPage();
         }
      });
   }
   private void openWebPage() {
      // Define the URL to open
      String webpageUrl = "https://www.rust-lang.org";
      // Create an implicit intent with ACTION_VIEW action and the webpage URL
      Intent intent = new Intent(Intent.ACTION_VIEW, Uri.parse(webpageUrl));
      // Start the activity without checking for resolution
      startActivity(intent);
   }

}
```

Activity_first.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:layout_width="match_parent"
   android:layout_height="match_parent" tools:context=".FirstActivity"
   android:background="@drawable/gradient_first_activity">

   <ImageButton android:id="@+id/imageButton1"
      android:layout_width="254dp"
      android:layout_height="238dp"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:layout_marginEnd="8dp"
```

```
        android:layout_marginBottom="8dp"
        android:background="@drawable/button_background"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.44"
        app:srcCompat="@drawable/arrow_right"
        tools:ignore="SpeakableTextPresentCheck"
        android:contentDescription="@string/btn1_name" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_second.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:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".SecondActivity">

<ImageButton android:id="@+id/imageButton2"
android:layout_width="254dp"
android:layout_height="238dp"
android:layout_marginStart="8dp"
android:layout_marginTop="8dp"
android:layout_marginEnd="8dp"
android:layout_marginBottom="8dp"
android:background="@drawable/button_background"
android:contentDescription="@string/btn2_name"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.496"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.731"
app:srcCompat="@drawable/arrow_left"
    tools:ignore="SpeakableTextPresentCheck,ImageContrastCheck" />

  <ImageButton android:id="@+id/imageButton3"
    android:layout_width="254dp"
```

```
        android:layout_height="238dp"
        android:layout_marginStart="78dp"
        android:layout_marginTop="78dp"
        android:layout_marginEnd="79dp"
        android:layout_marginBottom="41dp"
        android:background="@drawable/button_background"
        android:contentDescription="@string/btn3_name"
        app:layout_constraintBottom_toTopOf="@+id/imageButton2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:srcCompat="@drawable/arrow_right"
        tools:ignore="SpeakableTextPresentCheck,ImageContrastCheck" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Activity_third.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:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".ThiredActivity">

   <TextView
      android:id="@+id/timerTextView"
      android:layout_width="221dp"
      android:layout_height="169dp"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:layout_marginEnd="8dp"
      android:layout_marginBottom="8dp"
      android:text="00:00"
android:textSize="36sp"
android:textAlignment="center"
 android:textStyle="bold"
android:padding="16dp"
android:gravity="center"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.531"
app:layout_constraintStart_toStartOf="parent"
```

```
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.485" />

<Button android:id="@+id/button4"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="8dp"
android:layout_marginTop="8dp"
android:layout_marginEnd="8dp"
android:layout_marginBottom="8dp"
android:text="@string/btn4_name"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintHorizontal_bias="0.498"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/timerTextView
" app:layout_constraintVertical_bias="0.435" />

</androidx.constraintlayout.widget.ConstraintLayout>
```


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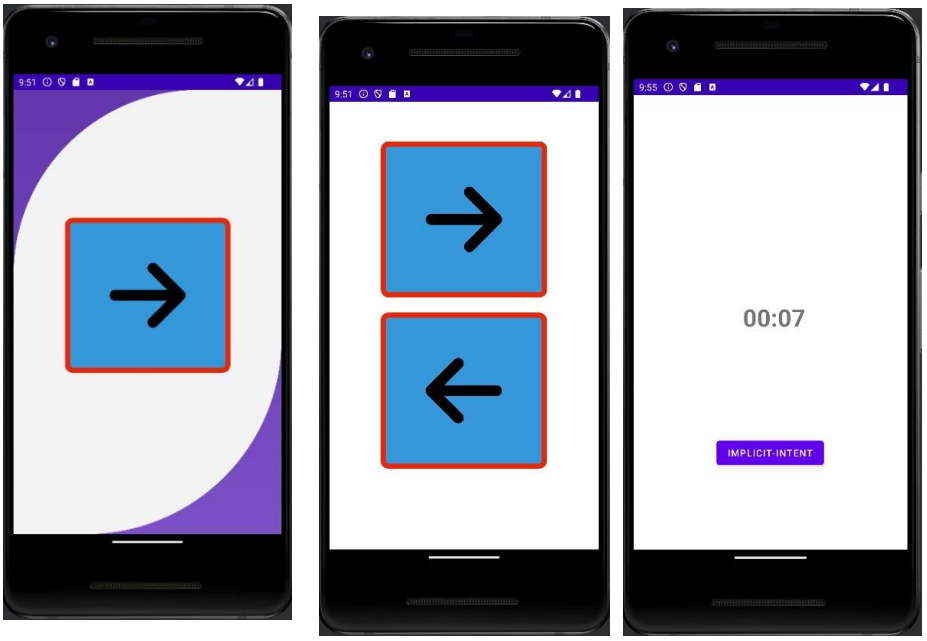
Output:



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Practical-3

Title: AlertSample

This project helps to introduce the implementation of alerts and toast messages in Android development. This simple yet effective app provides a button that, when tapped, triggers an alert with OK and Cancel buttons. Upon tapping either button, a corresponding toast message is displayed.

Learning Outcomes:

1. Alert Dialog Implementation: Learn how to create and display alert dialogs with customizable buttons.
2. Button Click Handling: Understand the process of handling button clicks within an alert dialog.
3. Toast Message Display: Explore the integration of toast messages to provide concise feedback based on user actions.

Code:

MainActivity.java package

```
com.anirudha.alertsample;

import androidx.appcompat.app.AlertDialog; import
androidx.appcompat.app.AppCompatActivity; import
android.os.Bundle; import
android.content.DialogInterface; import
android.view.View; import android.widget.Toast;
public class MainActivity extends AppCompatActivity
{

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

   public void onClickShowAlert(View view) {
    AlertDialog.Builder myAlertBuilder = new AlertDialog.Builder(MainActivity.this);
    myAlertBuilder.setTitle(R.string.alert_title);
    myAlertBuilder.setMessage(R.string.alert_message);
    myAlertBuilder.setPositiveButton(R.string.ok, new DialogInterface.OnClickListener() {
      public void onClick(DialogInterface dialog, int which) {
```


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6B30

```
                Toast.makeText(getApplicationContext(), R.string.pressed_ok,
                    Toast.LENGTH_SHORT).show();
            }
        });
        myAlertBuilder.setNegativeButton(R.string.cancel, new DialogInterface.OnClickListener()
{
            public void onClick(DialogInterface dialog, int which) {
                Toast.makeText(getApplicationContext(), R.string.pressed_cancel,
                    Toast.LENGTH_SHORT).show();
            }
        });
        myAlertBuilder.show();

    }
}
```

Activity_main.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:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="@dimen/activity_vertical_margin"
    android:paddingLeft="@dimen/activity_horizontal_margin"
    android:paddingRight="@dimen/activity_horizontal_margin"
    android:paddingTop="@dimen/activity_vertical_margin"
    tools:context=".MainActivity">

    <TextView android:id="@+id/top_message"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginBottom="8dp"
        android:text="@string/tap_test"
        app:layout_constraintBottom_toTopOf="@+id/button1"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
```


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```
   <Button android:id="@+id/button1"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@id/top_message"
      android:layout_marginStart="8dp"
      android:layout_marginTop="8dp"
      android:layout_marginEnd="8dp"
      android:onClick="onClickShowAlert"
android:text="@string/alert_button"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toBottomOf="@+id/top_message" />

</androidx.constraintlayout.widget.ConstraintLayout>
```


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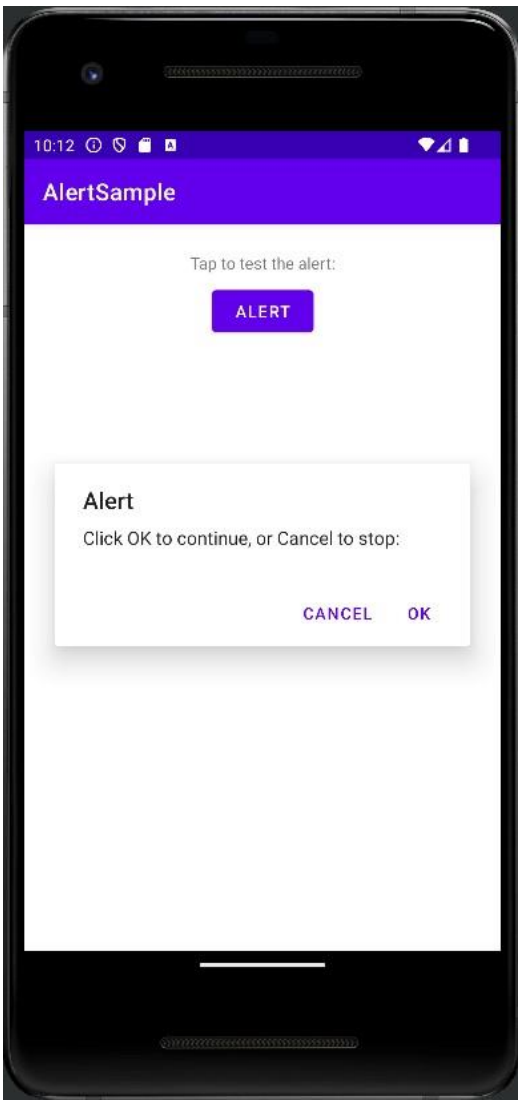
Output:



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Practical-4

Title: RupeeConvertor

In this app, users can enter a dollar amount in an EditText view, and upon submission, the app will display the converted amount in rupees through a toast message.

Learning Objectives:

EditText View Handling: Students will learn how to incorporate an EditText view, allowing users to input data into the app. Understanding how to capture and manipulate user input is a crucial aspect of Android development.

Conversion Logic: Through this project, students will gain experience in implementing logical conversions. Converting a dollar amount to rupees requires applying a specific conversion factor, demonstrating the practical application of mathematical operations in Android development.

Toast Message Display: The app employs a toast message to display the converted rupees amount. This aspect of the project teaches students how to provide user feedback and communicate results effectively.

Code:

MainActivity.java package

```
com.anirudha.rupeeconvertor;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; import android.util.Log;
import android.view.View; import
android.widget.Button; import
android.widget.EditText; import android.widget.Toast;
public class MainActivity extends AppCompatActivity
{

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main); Button
      btn=findViewById(R.id.converterButton);
```


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```
        btn.setOnClickListener(new View.OnClickListener()
        {
          @Override
          public void onClick(View v) {
            convertToRupees();
          }
        });
      }

      public void convertToRupees()
      {
        try {
          EditText textConvert = (EditText) findViewById(R.id.dollerTextInput);
          Double
          doller=Double.parseDouble(textConvert.getText().toString());
          //Doller rate into rupees-dated 31Dec2023
          Double rupees = doller * 83.25;
          String strDouble = String.format("%.2f",rupees);
          Toast.makeText(this, doller+": Doller Converted "+"to Rupees :"+strDouble,
Toast.LENGTH_LONG).show();
          //String rupString=Double.toString(rupees);
        }
        catch(Exception e)
        {
          Log.i("Info","Exception Occured ::"+e);
        }
      }

}
```

Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">
  <com.google.android.material.textview.MaterialTextView
    android:id="@+id/welcomemsg"
```

```
style="@style/Widget.MaterialComponents.TextView"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="@string/welcome_doller_to_rupees_converter"
android:textStyle="bold|italic"
app:layout_constraintBottom_toBottomOf="@id/dollerInputLayout"
app:layout_constraintBottom_toTopOf="@id/dollerInputLayout"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.233"
/><com.google.android.material.textfield.TextInputLayout
```

```
android:id="@+id/dollerInputLayout" android:layout_width="match_parent"
android:layout_height="wrap_content" android:layout_margin="20dp"
android:hint="@string/Amount_Doller"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.233"
        style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox" >

        <com.google.android.material.textfield.TextInputEditText
        android:id="@+id/dollerTextInput"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:inputType="numberDecimal"
        android:maxLength="5" android:maxLines="1"
        android:singleLine="true"
        tools:ignore="TextContrastCheck,VisualLintTextFieldSize" />

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

        <com.google.android.material.button.MaterialButton
        android:id="@+id/converterButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="10dp" android:onClick="convetToRupees"
        android:text="@string/convert"
        app:layout_constraintBottom_toBottomOf="parent"
```

```
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="@id/dollerInputLayout"
app:layout_constraintVertical_bias="0.233" />

</androidx.constraintlayout.widget.ConstraintLayout
```

Output:

210303105252
Smit Chauhan
6B30

Practical-5

Title: Random Number Puzzle

This app challenges users to guess a randomly generated number, providing an engaging way to learn about Math.random and reinforcing essential concepts in Android app development.

Learning Objectives:

Random Number Generation: Students will gain hands-on experience in utilizing the Math.random method to generate random numbers. Understanding how to incorporate randomness into an app is a valuable skill in game development and other interactive applications.

User Input Handling: The project encourages students to implement logic for handling user input as they attempt to guess the randomly generated number. This involves capturing and processing user guesses to determine the outcome of the game.

Toast Message Display: The app employs toast messages to provide feedback to users regarding the success or failure of their guess. This aspect reinforces the importance of effective communication within an app.

Code:

MainActivity.java package

```
com.anirudha.randomnumpuzzel;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; import android.util.Log;
import android.view.View; import
android.widget.EditText; import android.widget.Toast;
public class MainActivity extends AppCompatActivity
{

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

```
        randomnumber();
    }
    int random;
    public void randomnumber()
    {
        random = (int)(Math.random()*((20-1)+1))+1;
        /*Random rand=new Random();
        random=rand.nextInt(20)+1;*/
    }

    public void randomgenerate(View v)
    {
        try {
            EditText number = (EditText)
            findViewById(R.id.puzzelInputText); int guessVal =
            Integer.parseInt(number.getText().toString()); String message; if
            (random < guessVal) {
                message = "Random-Number is Lower";
            } else if (random > guessVal) { message =
                "Random-Numebr is Higher";
            } else { message = "Correct-
                Guess!";
                randomnumber();
            }
            Toast.makeText(this, "hey!"+message, Toast.LENGTH_SHORT).show();

        }
        catch(Exception e)
        {
            Log.i("Exception","Occured in :"+e);
        }
    }

}
```

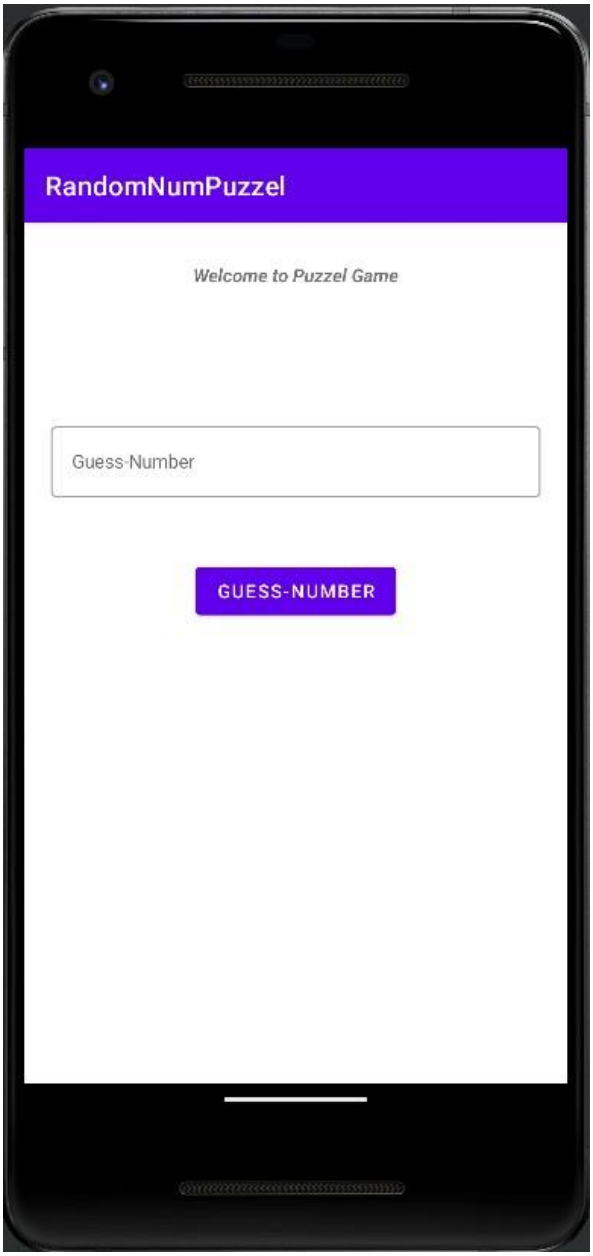
Activity_main.xml

```
<?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:layout_width="match_parent"
```

```
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <com.google.android.material.textview.MaterialTextView
        android:id="@+id/welcomemsg"
        android:layout_height="wrap_content"
        android:layout_width="wrap_content"
        android:textStyle="bold|italic"
        app:layout_constraintBottom_toBottomOf="@id/puzzelInputLayout"
        app:layout_constraintBottom_toTopOf="@id/puzzelInputLayout"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.233"
style="@style/Widget.MaterialComponents.TextView"
android:text="@string/welcome"/>


<com.google.android.material.textfield.TextInputLayout
android:id="@+id/puzzelInputLayout"
style="@style/Widget.MaterialComponents.TextInputLayout.OutlinedBox"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="20dp"
android:layout_marginStart="20dp"
android:layout_marginEnd="20dp"
android:layout_marginBottom="654dp"
android:hint="@string/GuessNumber"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent"
app:layout_constraintVertical_bias="0.233">

<com.google.android.material.textfield.TextInputEditTex
t android:id="@+id/puzzelInputText"
style="@style/Widget.MaterialComponents.TextView"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:inputType="number" android:maxLength="5"
android:maxLines="1" android:singleLine="true"
android:textColorHint="#757575"
```

```
tools:ignore="VisualLintTextFieldSize,TextContrastCheck" />

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

<com.google.android.material.button.MaterialButton
android:id="@+id/puzzelButton"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:onClick="randomgenerate"
android:text="@string/GuessNumber"
app:layout_constraintBottom_toBottomOf="parent"
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="@id/puzzelInputLayout"
app:layout_constraintVertical_bias="0.233" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:



210303105252
Smit Chauhan
6B30

Practical-6

Title: Rotate Image

This app allows users to dynamically select an image from their device using an image picker. Once the image is selected, users can rotate it using buttons corresponding to left, right, top, and bottom directions.

Learning Objectives:

Image Picker Implementation: Students will learn how to incorporate an image picker to allow users to dynamically select an image from their device. Understanding how to utilize the image picker enhances their skills in handling user interactions.

ImageView Manipulation: The app provides a practical example of manipulating an ImageView, demonstrating how to rotate an image dynamically based on user input. This involves updating the rotation angle and redrawing the ImageView.

Button Click Handling: Students will gain experience in handling button clicks to trigger specific actions. In this case, buttons for left, right, top, and bottom rotations will serve as interactive elements.

Code:

MainActivity.java package

```
com.anirudha.rotateimage;

import androidx.activity.result.ActivityResultCallback; import
androidx.activity.result.ActivityResultLauncher; import
androidx.activity.result.contract.ActivityResultContracts;
import androidx.appcompat.app.AppCompatActivity; import
android.graphics.Bitmap; import android.graphics.Matrix;
import android.net.Uri; import android.os.Bundle; import
android.provider.MediaStore; import android.view.View;
import android.widget.Button; import
android.widget.ImageView; import android.widget.Toast;
import java.io.IOException;

public class MainActivity extends AppCompatActivity {
   private static final int PICK_IMAGE_REQUEST = 1;
   private ImageView imageView;
```

```
    private Bitmap selectedBitmap;

    private final ActivityResultLauncher<String> imagePickerLauncher =
registerForActivityResult( new
            ActivityResultContracts.GetContent(),
            new ActivityResultCallback<Uri>() {
                @Override
                public void onActivityResult(Uri result) {
                    if (result != null) {
                        try {
                            selectedBitmap =
MediaStore.Images.Media.getBitmap(getContentResolver(), result);
                            imageView.setImageBitmap(selectedBitmap);
                        } catch (IOException e) {
                            e.printStackTrace();
                        }
                    }
                }
            }
    );

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

        imageView = findViewById(R.id.imageView);
        Button rotateLeftButton = findViewById(R.id.rotateLeftButton);
        Button rotateRightButton = findViewById(R.id.rotateRightButton);
        Button rotateTopButton = findViewById(R.id.rotateTopButton); Button
        rotateBottomButton = findViewById(R.id.rotateBottomButton);

        rotateLeftButton.setOnClickListener(new View.OnClickListener() {
            @Override public void
            onClick(View v) {
                rotateImage(-90);
                Toast.makeText(MainActivity.this, "Rotate Left", Toast.LENGTH_SHORT).show();
            }
        });

        rotateRightButton.setOnClickListener(new View.OnClickListener() {
            @Override public void
            onClick(View v) {
```

```
            rotateImage(90);
            Toast.makeText(MainActivity.this, "Rotate Right", Toast.LENGTH_SHORT).show();
        }
    });

    rotateTopButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            rotateImage(-90); // Rotate counterclockwise for "Top"
            Toast.makeText(MainActivity.this, "Rotate Top", Toast.LENGTH_SHORT).show();
        }
    });

    rotateBottomButton.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View v) {
            rotateImage(90); // Rotate clockwise for "Bottom"
            Toast.makeText(MainActivity.this, "Rotate Bottom", Toast.LENGTH_SHORT).show();
        }
    });
}

private void rotateImage(float angle) {
    if (selectedBitmap != null) {
        Matrix matrix = new Matrix();
        matrix.postRotate(angle);
        Bitmap rotatedBitmap = Bitmap.createBitmap(selectedBitmap, 0, 0,
selectedBitmap.getWidth(), selectedBitmap.getHeight(), matrix, true);
imageView.setImageBitmap(rotatedBitmap);
    }
}

public void chooseImage(View view) {
    imagePickerLauncher.launch("image/*");
}
}
```

Activity_main.xml

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

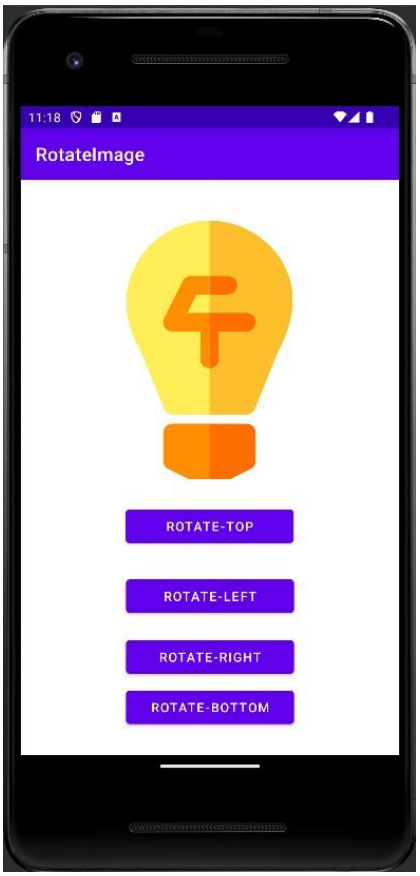
```
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MainActivity">


<ImageView
   android:id="@+id/imageView"
   android:layout_width="328dp"
   android:layout_height="322dp"
   android:layout_marginStart="8dp"
   android:layout_marginTop="8dp"
   android:layout_marginEnd="8dp"
   android:layout_marginBottom="8dp"
   app:layout_constraintBottom_toBottom
   Of="parent"
   app:layout_constraintEnd_toEndOf="par
   ent"
   app:layout_constraintHorizontal_bias="
   0.492"
   app:layout_constraintStart_toStartOf="p
   arent"
   app:layout_constraintTop_toTopOf="par
   ent"
   app:layout_constraintVertical_bias="0.0
   58"
   app:srcCompat="@drawable/app_icon"
   android:contentDescription="Image to
   rotate"
   android:onClick="chooseImage"/>


<Button
   android:id="@+id/rotateTopButton"
   android:layout_width="183dp"
   android:layout_height="48dp"
   android:layout_marginStart="114dp"
   android:layout_marginTop="20dp"
   android:layout_marginEnd="114dp"
   android:layout_marginBottom="19dp"
   android:text="@string/btn_top"
```

```
    app:layout_constraintBottom_toTopOf="@+id/rotateLeftButton"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/imageView" />

<Button
    android:id="@+id/rotateLeftButton"
    android:layout_width="183dp"
    android:layout_height="48dp"
    android:layout_marginStart="114dp"
    android:layout_marginTop="9dp"
    android:layout_marginEnd="114dp"
    android:layout_marginBottom="14dp"
    android:text="@string/btn_left"
    app:layout_constraintBottom_toTopOf="@+id/rotateRightButton"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/rotateTopButton" />

<Button
    android:id="@+id/rotateRightButton"
    android:layout_width="183dp"
    android:layout_height="48dp"
    android:layout_marginStart="114dp"
    android:layout_marginTop="4dp"
    android:layout_marginEnd="114dp"
    android:layout_marginBottom="7dp"
    android:text="@string/btn_right"
    app:layout_constraintBottom_toTopOf="@+id/rotateBottomButton"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/rotateLeftButton" />

<Button android:id="@+id/rotateBottomButton"
    android:layout_width="183dp"
    android:layout_height="48dp"
    android:layout_marginStart="114dp"
    android:layout_marginEnd="114dp"
    android:layout_marginBottom="41dp"
    android:text="@string/btn_bottom"
    app:layout_constraintBottom_toBottomOf="parent"
```


210303105252
Smit Chauhan
6B30

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/rotateRightButton" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Output:



210303105252
Smit Chauhan
6B30

Practical-7

Title: Fragment LIfeCycle

This educational app allows students to gain hands-on experience by overriding various fragment lifecycle methods, showcasing how each method is called during different stages of the fragment's lifecycle.

Learning Objectives:

Fragment Lifecycle Methods: Students will gain a comprehensive understanding of the various methods available in the fragment lifecycle, including onAttach(), onCreate(), onCreateView(), onActivityCreated(), onStart(), onResume(), onPause(), onStop(), onDestroyView(), onDestroy(), and onDetach().

Lifecycle Demonstration: The app serves as a practical demonstration of how each lifecycle method is invoked during different phases of the fragment's existence. Students will observe how these methods can be utilized to perform specific actions or handle events at each lifecycle stage.

Logging and Debugging: By incorporating logging statements within each lifecycle method, the project emphasizes the importance of logging for debugging and understanding the sequence of events during the fragment's lifecycle.

Code:

MainActivity.java package

```
com.anirudha.fragmentlifecycle;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import com.anirudha.fragmentlifecycle.fragment.FragmentLifeCycle;

public class MainActivity extends AppCompatActivity {
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    if (savedInstanceState == null) {
      // Add the initial fragment when the activity is created.
      getSupportFragmentManager().beginTransaction()
```

```
                .add(R.id.fragmentContainerView, new FragmentLifeCycle())
                .commit();
        }
      }
    }
```

Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">

  <androidx.fragment.app.FragmentContainerView
    android:id="@+id/fragmentContainerView"
    android:name="com.anirudha.fragmentlifecycle.fragment.FragmentLifeCycle
    " android:layout_width="match_parent"
    android:layout_height="match_parent" android:layout_marginStart="1dp"
    android:layout_marginTop="1dp" android:layout_marginEnd="1dp"
    android:layout_marginBottom="1dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Life_cycle_fragment.xml

```
<?xml version="1.0" encoding="utf-8"?>
<FrameLayout 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"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  tools:context=".fragment.FragmentLifeCycle">

  <TextView android:id="@+id/textViewId"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:text="Hello"
```

```
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintVertical_bias="0.5" />

    </FrameLayout>
```

Output:

210303105252
Smit Chauhan
6B30

Practical-8

Title: Bottom Navigation Fragment

This project helps the implementation of a bottom navigation bar using the FragmentContainerView. This project leverages navigation graphs, menus, icons for menus, and fragments to create a seamless and organized user interface.

Learning Objectives:

Navigation Graph Implementation: Students will gain hands-on experience in creating a navigation graph to define the navigation flow between different fragments. Understanding navigation graphs is essential for building structured and intuitive navigation in Android apps.

Menu Implementation: This project involves the incorporation of menus within the bottom navigation bar. Students will learn how to define menus, attach icons to menu items, and establish connections between menus and corresponding fragments.

Icon Usage: The app utilizes icons for menu items, enhancing the visual appeal of the bottom navigation bar. Students will learn how to integrate and display icons alongside text in a user-friendly manner.

FragmentContainerView Integration: The project showcases the usage of FragmentContainerView to seamlessly host and switch between different fragments within the app. Students will understand how to structure and organize the app's content through fragments.

ViewModel Integration: Students will gain hands-on experience in integrating ViewModels to efficiently manage and share data between fragments. ViewModels play a crucial role in maintaining data consistency and providing a centralized location for data-related logic.

LiveData Usage: The project demonstrates the use of LiveData within ViewModels to observe changes in data and automatically update the UI. Students will learn how to leverage LiveData for responsive and real-time updates.

Fragment-ViewModel Communication: Understanding how to establish communication between fragments and ViewModels is a key focus. Students will learn how to pass data between fragments using shared ViewModels, promoting modularity and code organization.

210303105252
Smit Chauhan
6B30

Code:

MainActivity.java package
com.anirudha.bottomnavigationfragmentcontainerview;

import androidx.annotation.NonNull; import
androidx.appcompat.app.AppCompatActivity; import
androidx.fragment.app.Fragment; import
androidx.fragment.app.FragmentContainerView;
import androidx.navigation.NavController; import
androidx.navigation.Navigation; import
androidx.navigation.ui.AppBarConfiguration; import
androidx.navigation.ui.NavigationUI; import
android.view.MenuItem;

import
com.anirudha.bottomnavigationfragmentcontainerview.fragments.camera.CameraFragment;
import
com.anirudha.bottomnavigationfragmentcontainerview.fragments.meesage.MessageFragm
e nt; import
com.anirudha.bottomnavigationfragmentcontainerview.fragments.setting.SettingFragment;

import com.google.android.material.bottomnavigation.BottomNavigationView; import

android.os.Bundle;

public class MainActivity extends AppCompatActivity {
  private BottomNavigationView bottomNavigationView;
  private FragmentContainerView fragmentContainerView;
  private AppBarConfiguration appBarConfiguration;
  @Override
  protected void onCreate(Bundle savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    bottomNavigationView = findViewById(R.id.nav_view);
    fragmentContainerView = findViewById(R.id.nav_host_fragment_activity_main);
    // Set up initial fragment if
    (savedInstanceState == null) {
      getSupportFragmentManager().beginTransaction()
          .replace(R.id.nav_host_fragment_activity_main, new CameraFragment())
          .commit();
    }

    bottomNavigationView.setOnItemSelectedListener(new

```
BottomNavigationView.OnItemSelectedListener() {
        @Override
        public boolean onNavigationItemSelected(@NonNull MenuItem item) {
          Fragment selectedFragment = null;
          if (item.getItemId() == R.id.menu_camera) {
            selectedFragment = new CameraFragment();
          } else if (item.getItemId() == R.id.menu_message) {
            selectedFragment = new MessageFragment();
          } else if (item.getItemId() == R.id.menu_setting) {
            selectedFragment = new SettingFragment();
          }

          if (selectedFragment != null) {
            getSupportFragmentManager().beginTransaction()
                .replace(R.id.nav_host_fragment_activity_main, selectedFragment)
                .commit();
          }
          return true;
        }
      });
  }}
```

Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity"
  android:id="@+id/container"
  android:paddingTop="?attr/actionBarSize">

  <com.google.android.material.bottomnavigation.BottomNavigationView
    android:id="@+id/nav_view" android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_marginStart="0dp" android:layout_marginEnd="0dp"
    android:background="?android:attr/windowBackground"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintLeft_toLeftOf="parent"
    app:layout_constraintRight_toRightOf="parent"
    app:menu="@menu/bottom_nav_menu" />
```

```
    <androidx.fragment.app.FragmentContainerView
      android:id="@+id/nav_host_fragment_activity_main"

android:name="com.anirudha.bottomnavigationfragmentcontainerview.fragments.camera.
C ameraFragment" android:layout_width="match_parent"
      android:layout_height="match_parent"
      app:defaultNavHost="true"
      app:layout_constraintBottom_toTopOf="@id/nav_view"
      app:layout_constraintLeft_toLeftOf="parent"
      app:layout_constraintRight_toRightOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:navGraph="@navigation/mobile_navigation" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

Fragment_camera.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".fragments.camera.CameraFragment">

  <TextView android:id="@+id/text_camera"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:textAlignment="center"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintVertical_bias="0.5"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Fragment_message.xml

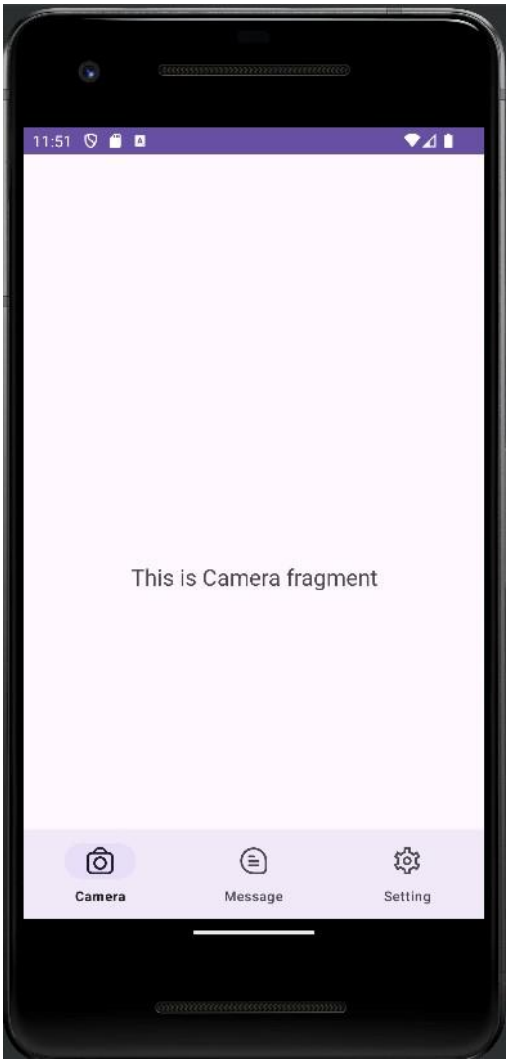
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
  xmlns:app="http://schemas.android.com/apk/res-auto"
  xmlns:tools="http://schemas.android.com/tools"
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".fragments.meesage.MessageFragment">

  <TextView
    android:id="@+id/text_message"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
    android:layout_marginEnd="8dp"
    android:textAlignment="center"
    android:textSize="20sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintHorizontal_bias="0.5"
    app:layout_constraintVertical_bias="0.5"/>

</androidx.constraintlayout.widget.ConstraintLayout>
```

Fragment_setting.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".fragments.setting.SettingFragment">

  <TextView android:id="@+id/text_setting"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginStart="8dp"
    android:layout_marginTop="8dp"
```

```
        android:layout_marginEnd="8dp"
        android:textAlignment="center"
        android:textSize="20sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintVertical_bias="0.5"/>

    </androidx.constraintlayout.widget.ConstraintLayout>
```

Output:



210303105252
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6B30

Practical-9

Title: ContextMenuScrollingText

Description: An instructive project designed to showcase the implementation of a ScrollView to display text and the integration of a context menu for enhanced user interactions. This educational app provides users with the ability to vertically scroll through the text content. Additionally, a context menu with options such as Edit, Share, and Delete becomes accessible through a long click on the TextView, enriching the user experience with additional functionalities.

Learning Objectives:

- ScrollView Implementation: Students will gain practical insights into implementing a ScrollView, allowing users to scroll vertically through text content that exceeds the available screen space.

- Context Menu Integration: The project demonstrates how to integrate a context menu triggered by a long click on the TextView. This introduces students to the concept of context menus and their application in Android development.

- Menu Options Handling: Students will learn how to handle menu item selections, specifically Edit, Share, and Delete, within the context menu. This involves displaying Toast messages to provide users with feedback regarding their chosen menu option.

Project Highlights:

- Interactive ScrollView: The app features an interactive ScrollView, enabling users to smoothly scroll through lengthy text content with a swipe gesture.

- Context Menu Implementation: Upon a long click on the TextView, a context menu with Edit, Share, and Delete options becomes accessible, showcasing the versatility of context menus in enhancing user interactions.

- Toast Messages: The project uses Toast messages to inform users about their selected context menu option, providing immediate and clear feedback.

210303105252
Smit Chauhan
6B30

- Practical Application: The "ContextMenuScrollingText" app serves as a practical example of combining ScrollView and context menus to create a user-friendly and feature-rich text display.

Code:

MainActivity.java package

```
com.anirudha.contextmenuscrollingtext;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle; import
android.view.ContextMenu; import
android.view.MenuInflater; import
android.view.MenuItem; import android.view.View;
import android.widget.TextView; import
android.widget.Toast; public class MainActivity
extends AppCompatActivity {

  @Override protected void onCreate(Bundle
  savedInstanceState) {
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    // Register the context menu to the TextView of the article.
    TextView article_text = findViewById(R.id.article);
    registerForContextMenu(article_text);
  }

  @Override
  public void onCreateContextMenu(ContextMenu menu,
                  View v,
                  ContextMenu.ContextMenuInfo menuInfo) {
    super.onCreateContextMenu(menu, v, menuInfo);
    MenuInflater inflater = getMenuInflater();
    inflater.inflate(R.menu.menu_context, menu);
  }

  @Override public boolean
  onContextItemSelected(MenuItem item) {
    int itemId = item.getItemId();
```

```
if (itemId == R.id.context_edit) {
   displayToast(getString(R.string.edit_message));
   return true;
} else if (itemId == R.id.context_share) {
   displayToast(getString(R.string.share_message));
   return true;
} else if (itemId == R.id.context_delete) {
   displayToast(getString(R.string.delete_message));
```

Output:

210303105252
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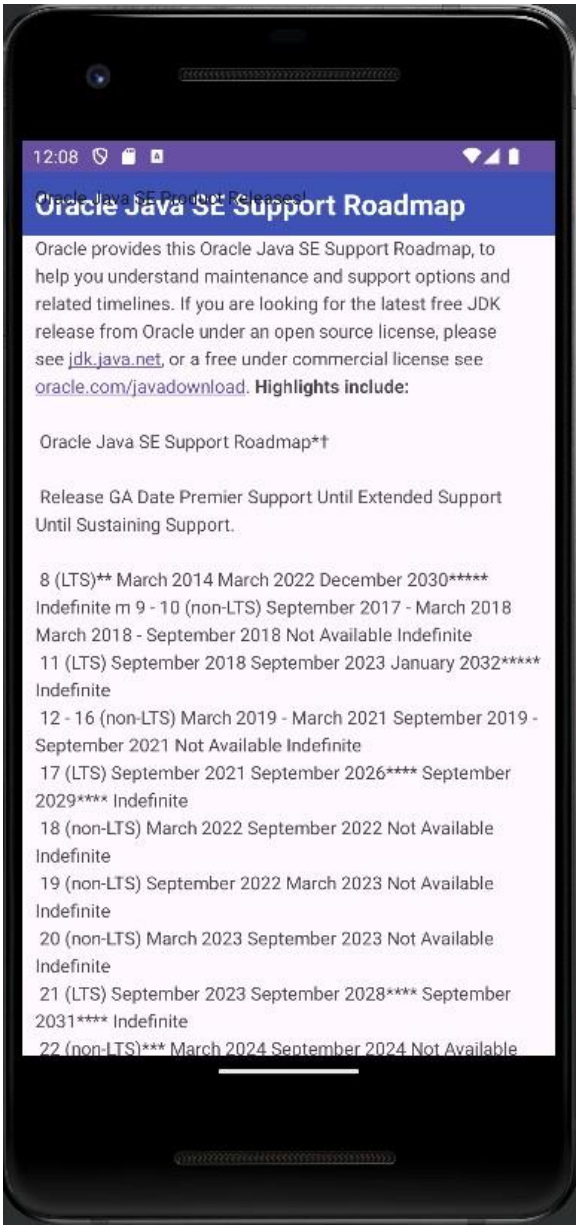
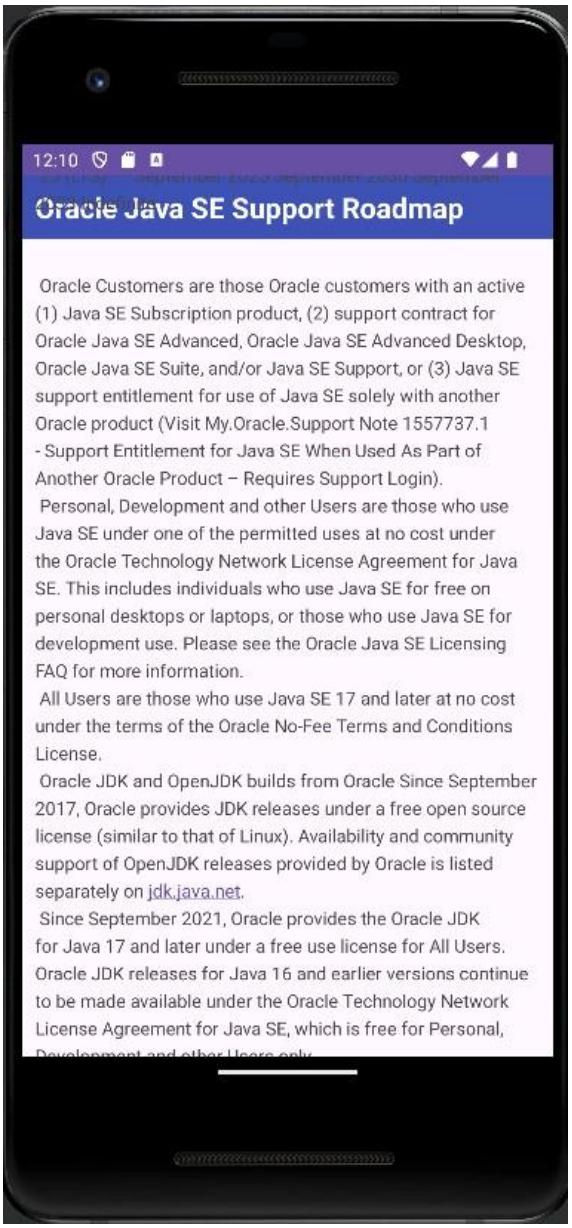
6B30





210303105252
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6B30

Practical-10

Title: SignUp-SignIn using Room with SharedPreferences

Code:

MainActivity.java package

```
com.anirudha.signupsignin_room_sharedpreferences;

import androidx.appcompat.app.AppCompatActivity;
import androidx.navigation.NavController; import
androidx.navigation.fragment.NavHostFragment;
import androidx.navigation.ui.AppBarConfiguration;
import androidx.navigation.ui.NavigationUI; import
android.os.Bundle;

public class MainActivity extends AppCompatActivity {
   AppBarConfiguration appBarConfiguration;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      // Set up Navigation
      NavHostFragment navHostFragment = (NavHostFragment)
getSupportFragmentManager().findFragmentById(R.id.fragmentContainerView);
NavController navController = navHostFragment.getNavController();
appBarConfiguration = new
AppBarConfiguration.Builder(navController.getGraph()).build();
      NavigationUI.setupActionBarWithNavController(this, navController,
appBarConfiguration);
   }

   @Override
   public boolean onSupportNavigateUp() {
      NavController navController =
NavHostFragment.findNavController(getSupportFragmentManager().findFragmentBy
Id(R.id.fragmentContainerView)); return
      NavigationUI.navigateUp(navController, appBarConfiguration) ||
super.onSupportNavigateUp();
```

```
    }
}
```

Activity_main.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.WRITE_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.SignUpSignIn_Room_SharedPreferences"
        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>
```

SharedPreferencesHelper.java package

```
com.anirudha.signupsignin_room_sharedpreferences.shareprefrence;
```

```
import android.content.Context; import
android.content.SharedPreferences;
import android.widget.Toast; import
androidx.navigation.NavController;
import com.anirudha.signupsignin_room_sharedpreferences.R;

public class SharedPreferencesHelper {

   // SharedPreferences keys
   private static final String PREF_NAME = "user_data";

   private static final String KEY_USERNAME =

   "username"; private static final String KEY_PASSWORD =

   "password"; private final SharedPreferences

   sharedPreferences; private final NavController

   navController; private final Context context; private

   static SharedPreferencesHelper instance;

   private SharedPreferencesHelper(Context context, NavController navController) {
      this.sharedPreferences =
context.getSharedPreferences(PREF_NAME, Context.MODE_PRIVATE);
this.navController = navController;

      this.context = context;
   }

   public static synchronized SharedPreferencesHelper getInstance(Context context,
NavController navController) {
      if (instance == null) {
         instance = new SharedPreferencesHelper(context, navController);
      }
      return instance;
   }

   public String getStoredUsername() {
```


210303105252
Smit Chauhan
6B30

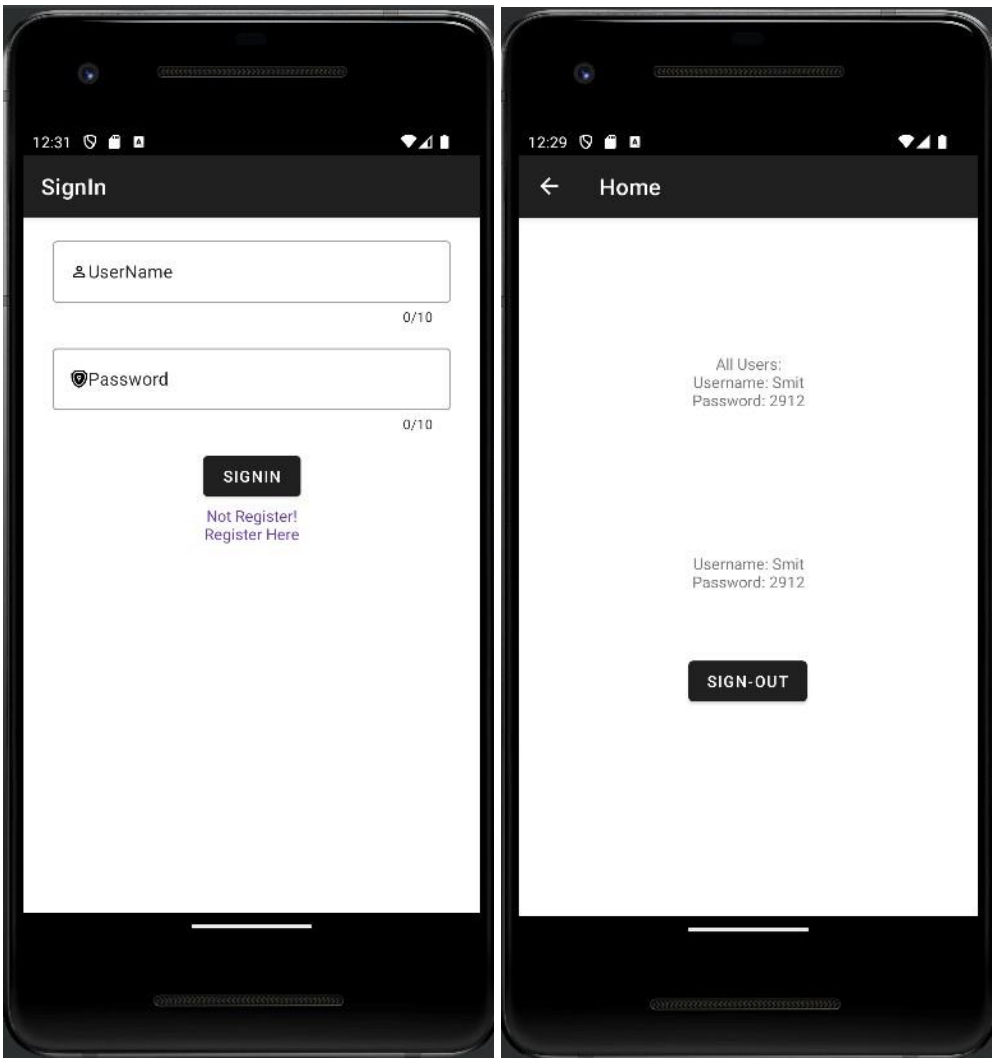
```
        return sharedPreferences.getString(KEY_USERNAME, "");
    }

    public String getStoredPassword() {
        return sharedPreferences.getString(KEY_PASSWORD, "");
    }

    public boolean isLoggedIn() {
        return sharedPreferences.getString(KEY_USERNAME, null) != null;
    }

    public void logout() {
        // Clear SharedPreferences
        SharedPreferences.Editor editor = sharedPreferences.edit();
        editor.clear();
        editor.apply();
        // Navigate to the login fragment
        navController.navigate(R.id.action_homeFragment_to_loginFragment);
        // Provide feedback to the user
        Toast.makeText(context, "Log-Out", Toast.LENGTH_LONG).show();
    } // end logout
}
```

Output:



210303105252
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6B30

Practical-11

Title: SignUp-SignIn using Room with SQL Dialect

Code:

MainActivity.java package

```
com.anirudha.signupsignin_sqldialect;

import androidx.appcompat.app.AppCompatActivity;
import androidx.fragment.app.FragmentContainerView;
import androidx.navigation.NavController; import
androidx.navigation.fragment.NavHostFragment;
import androidx.navigation.ui.AppBarConfiguration;
import androidx.navigation.ui.NavigationUI; import
android.os.Bundle;

public class MainActivity extends AppCompatActivity {
   AppBarConfiguration appBarConfiguration;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      NavHostFragment navHostFragment = (NavHostFragment)
getSupportFragmentManager().findFragmentById(R.id.fragmentContainerView);
NavController navController = navHostFragment.getNavController();
appBarConfiguration = new
AppBarConfiguration.Builder(navController.getGraph()).build();
      NavigationUI.setupActionBarWithNavController(this, navController,
appBarConfiguration);
   }

   @Override
   public boolean onSupportNavigateUp() {
      NavController navController =
NavHostFragment.findNavController(getSupportFragmentManager().findFragmentBy
Id(R.id.fragmentContainerView)); return
      NavigationUI.navigateUp(navController, appBarConfiguration) ||
super.onSupportNavigateUp();
```

```
    }
  }
```

Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">

  <androidx.fragment.app.FragmentContainerView
    android:id="@+id/fragmentContainerView"
    android:name="androidx.navigation.fragment.NavHostFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    app:defaultNavHost="true"
    app:navGraph="@navigation/mobile_navigation"
    android:layout_marginStart="1dp"
    android:layout_marginTop="1dp"
    android:layout_marginEnd="1dp"
    android:layout_marginBottom="1dp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

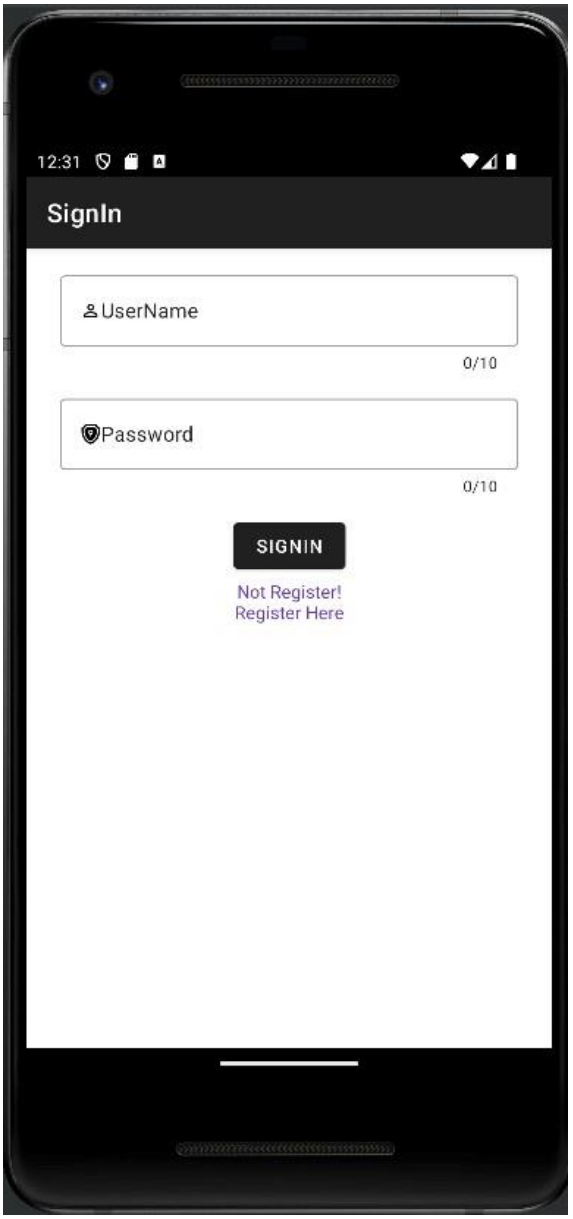
HomeActivity.java package

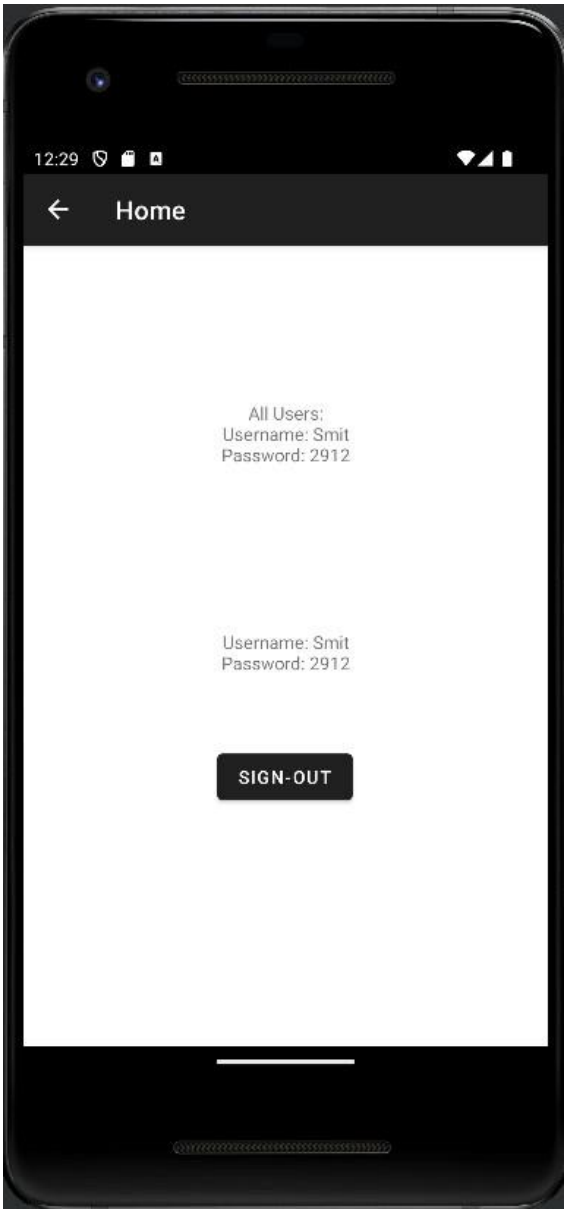
```
com.anirudha.signupsignin_sqldialect;

import androidx.appcompat.app.AppCompatActivity; import
androidx.navigation.NavController; import
androidx.navigation.fragment.NavHostFragment; import
android.content.Intent; import android.os.Bundle; import
android.widget.Button; import android.widget.TextView; import
com.anirudha.signupsignin_sqldialect.dao.User; import
```

```
com.anirudha.signupsignin_sqldialect.dao.UserDAOImpl; import
com.anirudha.signupsignin_sqldialect.loginfragmnet.LoginFragment;
import java.util.List;
public class HomeActivity extends AppCompatActivity {
private TextView userInfoTextView;
private Button signout; private
String currentUsername;
   private UserDAOImpl userDAO;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_home);
      userInfoTextView = findViewById(R.id.homeTextView);
      userDAO = new UserDAOImpl(this);
      signout=findViewById(R.id.signOut);
            Intent intent = getIntent(); if (intent != null &&
      intent.hasExtra("currentUsername")) {
         currentUsername = intent.getStringExtra("currentUsername");
      }
      displayCurrentUserInformation();
      signout.setOnClickListener(v -> navigateToLoginFragment());
   }
   private void fetchAllUsersData(){
      List<User> userList = userDAO.getAllUsers();
      StringBuilder userInfo = new StringBuilder("User Information:\n");
      for (User user : userList) {
         userInfo.append("Username: ").append(user.getUsername()).append("\n");
         userInfo.append("Username: ").append(user.getPassword()).append("\n");
         userInfo.append("\n");
      }
      userInfoTextView.setText(userInfo.toString());
   }
   private void navigateToLoginFragment() {
      NavHostFragment navHostFragment = (NavHostFragment)
getSupportFragmentManager().findFragmentById(R.id.fragmentContainerView);
NavController navController = navHostFragment.getNavController();
      navController.navigate(R.id.navigation_login);
      finish();
   }
```

```
    private void displayCurrentUserInformation() {
        User currentUser = userDAO.getUserByUsername(currentUsername);
        if (currentUser != null) {
            String userInfo = "User Information:\n" +
                    "Username: " + currentUser.getUsername() + "\n" +
                    "Password: " + currentUser.getPassword();
            userInfoTextView.setText(userInfo);
        }
    }
}
```

Output:





210303105252
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Practical-12

Title: SignUp-SignIn using Room with Retrofit API

Code:

MainActivity.java

```
package com.anirudha.signupin_retrofit_api; import
androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import com.anirudha.signupin_retrofit_api.api.ApiInterface;
import retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory;

public class MainActivity extends AppCompatActivity {

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

  }
}
```

Activity_main.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:layout_width="match_parent"
  android:layout_height="match_parent"
  tools:context=".MainActivity">

  <androidx.fragment.app.FragmentContainerView
    android:id="@+id/fragmentContainerView"
    android:name="androidx.navigation.fragment.NavHostFragment"
    android:layout_width="match_parent"
```


210303105252
Smit Chauhan
6B30

```
        android:layout_height="match_parent"
        app:defaultNavHost="true"
        app:navGraph="@navigation/nav_graph"
        android:layout_marginStart="1dp"
        android:layout_marginTop="1dp"
        android:layout_marginEnd="1dp"
        android:layout_marginBottom="1dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    </androidx.constraintlayout.widget.ConstraintLayout>
```

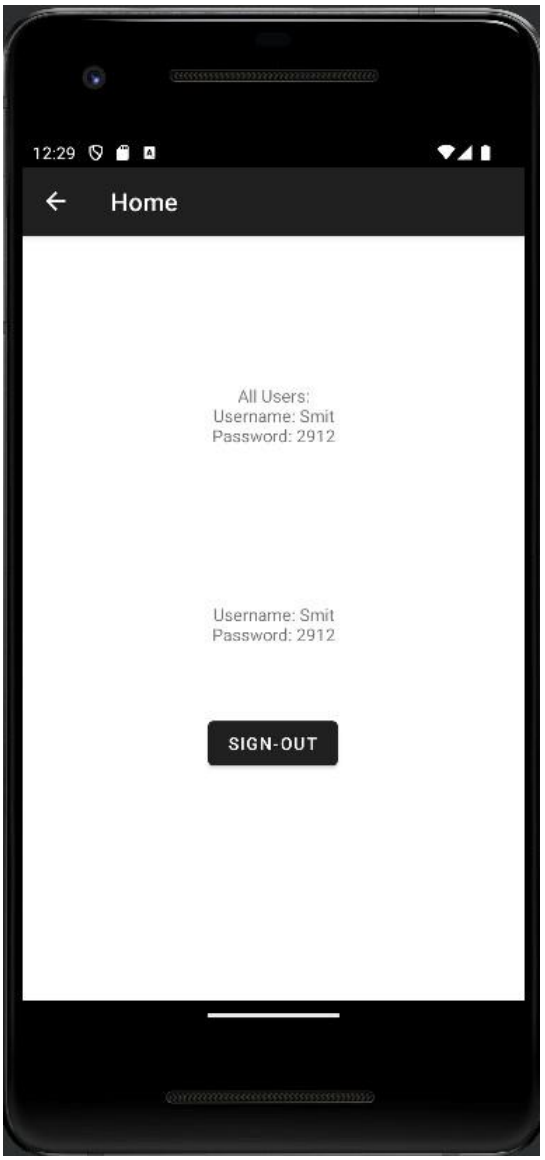
SharedPreferencesHelper.java package

```
    com.anirudha.signupsignin_room_sharedpreferences.shareprefrence;

    import android.content.Context; import
    android.content.SharedPreferences;
    import android.widget.Toast; import
    androidx.navigation.NavController;
    import com.anirudha.signupsignin_room_sharedpreferences.R;

    public class SharedPreferencesHelper {
      private static final String PREF_NAME = "user_data";
      private static final String KEY_USERNAME =
      "username"; private static final String KEY_PASSWORD =
      "password"; private final SharedPreferences
      sharedPreferences; private final NavController
      navController; private final Context context;
      private static SharedPreferencesHelper instance;

      private SharedPreferencesHelper(Context context, NavController navController) {
        this.sharedPreferences = context.getSharedPreferences(PREF_NAME,
    Context.MODE_PRIVATE);
        this.navController = navController;
        this.context = context;
      }
```


210303105252
Smit Chauhan
6B30

```
    public void saveCredentials(String username, String password) {
        SharedPreferences.Editor editor = sharedPreferences.edit();
        editor.putString(KEY_USERNAME, username);
        editor.putString(KEY_PASSWORD, password);
        editor.apply();
    }
    public String getStoredPassword() {
        return sharedPreferences.getString(KEY_PASSWORD, "");
    }
    public boolean isLoggedIn() {
        return sharedPreferences.getString(KEY_USERNAME, null) != null;
    }

    public void logout() {
        SharedPreferences.Editor editor =
        sharedPreferences.edit(); editor.clear(); editor.apply();
        navController.navigate(R.id.action_homeFragment_to_loginFragment);
        Toast.makeText(context, "Log-Out", Toast.LENGTH_LONG).show();
    }
}
```

Output:



210303105252
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6B30

Practical-13

Title: SignUp-SignIn using Firebase

Code:

MainActivity.java

```
package com.anirudha.singupsignin_firebase; import
androidx.appcompat.app.AppCompatActivity; import
android.os.Bundle; public class MainActivity extends
AppCompatActivity {

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

Activity_main.xml

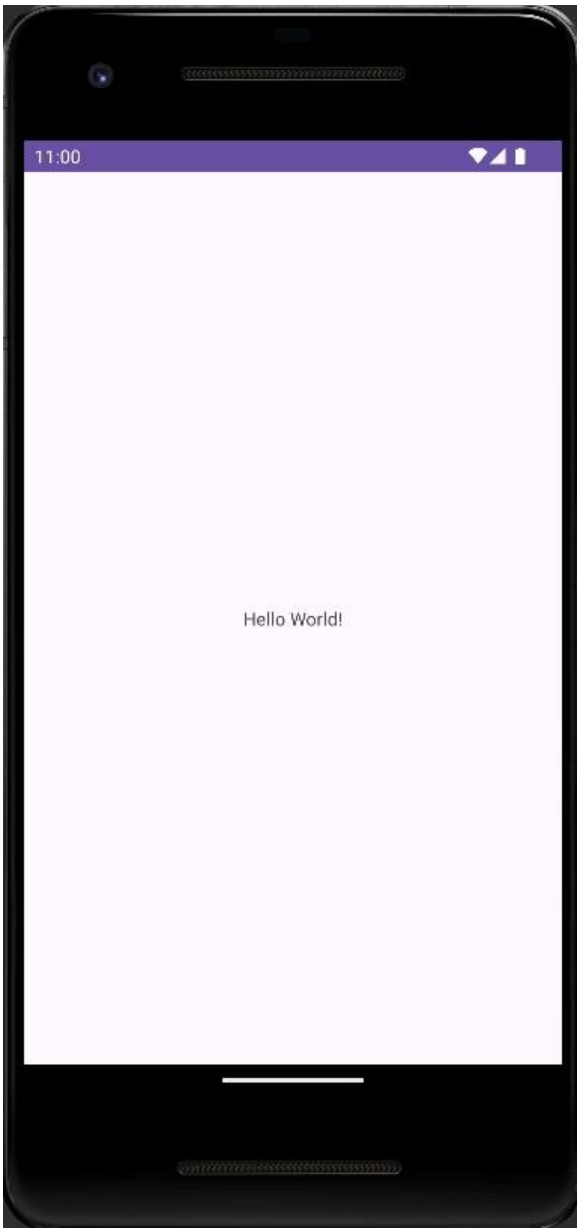
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:app="http://schemas.android.com/apk/res-auto"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">

   <TextView android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello World!"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```


210303105252
Smit Chauhan
6B30

Output:



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Practical-14

Title: Weather App

Code:

WeatherActivity.java package

```
com.anirudha.weatherapp;

import android.Manifest;
import
android.content.pm.PackageManager;
import android.location.Location; import
android.os.Bundle; import android.util.Log;
import android.widget.TextView; import
android.widget.Toast;

import androidx.annotation.NonNull; import
androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat; import
androidx.core.content.ContextCompat;

import
com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationCallback; import
com.google.android.gms.location.LocationRequest; import
com.google.android.gms.location.LocationResult; import
com.google.android.gms.location.Priority; import java.io.IOException;

import okhttp3.OkHttpClient;
import retrofit2.Call; import
retrofit2.Callback; import
retrofit2.Response; import
retrofit2.Retrofit;
import retrofit2.converter.gson.GsonConverterFactory; public class

WeatherActivity extends AppCompatActivity { private static final int

LOCATION_PERMISSION_REQUEST_CODE = 1001;
```

```
    private WeatherApi weatherApi;
    private FusedLocationProviderClient fusedLocationClient;
    private TextView
textViewTemperature,textViewWindSpeed,textViewCity,textViewLong,textViewLat,te
xtViewSunRise,textViewSunset,textViewCntry ;

    // https://openweathermap.org/api
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_weather);
        Log.d("WeatherActivity", "Inside onCreate");
        // Create a single OkHttpClient instance to be reused
        OkHttpClient okHttpClient = new OkHttpClient();
        // Initialize Retrofit
        Retrofit retrofit = new Retrofit.Builder()
                .baseUrl("https://api.openweathermap.org/data/2.5/") // replace with your
weather API base URL
                .addConverterFactory(GsonConverterFactory.create())
                .client(okHttpClient) // Pass the OkHttpClient instance
                .build();

        // Create WeatherApi instance weatherApi =
        retrofit.create(WeatherApi.class); // Initialize
        FusedLocationProviderClient
        fusedLocationClient = new FusedLocationProviderClient(this);
        // Check and request location permissions
        checkLocationPermission();
    }

    private void checkLocationPermission() {
        Log.d("WeatherActivity", "Inside checkLocationPermission");
        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
                != PackageManager.PERMISSION_GRANTED) {
            // Permission is not granted
            ActivityCompat.requestPermissions(this, new
                    String[]{Manifest.permission.ACCESS_FINE_LOCATION},
                    LOCATION_PERMISSION_REQUEST_CODE);
```

```
        } else {
            // Permission is already granted
            getLastLocation();
        }
    }

    private void getLastLocation() {
        Log.d("WeatherActivity", "Inside getLastLocation");
        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
                == PackageManager.PERMISSION_GRANTED) {
            fusedLocationClient.getLastLocation()
                    .addOnSuccessListener(this, location -> {
                        if (location != null) {
                            double latitude = location.getLatitude();
                            double longitude = location.getLongitude();
                            Log.d("WeatherActivity","getLastLocation logitude : "+longitude);
                            Log.d("WeatherActivity","getLastLocation latitude : "+latitude);
                            // Fetch weather data using Retrofit
                            fetchWeatherData(latitude, longitude);
                        } else {
                            Log.d("WeatherActivity","call requestLocationUpdates in
getLastLocation");

                            requestLocationUpdates();
                        }
                    });
        }
    }

    private void requestLocationUpdates() {
        Log.d("WeatherActivity", "Inside requestLocationUpdates");
        if (ContextCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION)
                == PackageManager.PERMISSION_GRANTED) {

            LocationRequest locationRequest = LocationRequest
                    .create()
                    .setPriority(Priority.PRIORITY_HIGH_ACCURACY)
```

```
                .setInterval(5000); // Update location every 5 seconds

            LocationCallback locationCallback = new LocationCallback() {
              @Override
              public void onLocationResult(@NonNull LocationResult locationResult) {
                Log.d("WeatherActivity", "Location updates received");
                if (locationResult != null) {
                  Location location =
                  locationResult.getLastLocation(); double latitude =
                  location.getLatitude(); double longitude =
                  location.getLongitude();
                  Log.d("WeatherActivity : ","onLocationResult logitude : "+longitude);
                  Log.d("WeatherActivity : ","onLocationResult latitude : "+latitude);
                }
    }
```

WeatherData.java package

```
    com.anirudha.weatherapp;

    import java.util.List;

    public class WeatherData {
      private Coord coord; private
      List<Weather> weather; private
      String base; private Main main;
      private int visibility; private Wind
      wind; private Clouds clouds;
      private long dt; private Sys sys;
      private int timezone; private int id;
      private String name; private int
      cod; // Constructors, getters, and
      setters

      public Coord getCoord() {
        return coord;
      }

      public void setCoord(Coord coord) {
        this.coord = coord;
      }
```

```
public String getBase() {
   return base;
}

public void setBase(String base) {
   this.base = base;
}
@Override public String
toString() { return
"WeatherData{" +
        "coord=" + coord +
        ", weather=" + weather +
        ", base='" + base + '\'' +
        ", main=" + main +
        ", visibility=" + visibility +
        ", wind=" + wind +
        ", clouds=" + clouds +
        ", dt=" + dt +
        ", sys=" + sys +
        ", timezone=" + timezone +
        ", id=" + id +
        ", name='" + name + '\'' +
        ", cod=" + cod +
        '}';
}

public static class Weather {
   private int id; private String main;
   private String description; private
   String icon; // Constructors, getters,
   and setters...

   @Override public
   String toString() {
      return "Weather{" +
           "id=" + id +
           ", main='" + main + '\'' +
           ", description='" + description + '\'' +
           ", icon='" + icon + '\'' +
```

```
            '}';
    }
}
public static class Main {
    private double temp;
    private double feels_like;
    private double temp_min;
    private double temp_max;
    private int pressure;
    private int humidity;
    private int sea_level;
    private int grnd_level;
    public double getTemp() {
        return temp;
    }

    public double getFeels_like() {
        return feels_like;
    }

    public double getTemp_min() {
        return temp_min;
    }
```


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Output:

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Practical-15

Title: Water Supplier App

Code:

MainActivity.java package com.anirudha.watersupplier;

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

import android.os.Bundle; public class MainActivity

extends AppCompatActivity {

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

Activity_main.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:layout_width="match_parent"
   android:layout_height="match_parent"
   tools:context=".MainActivity">

   <TextView android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Hello World!"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />
      </androidx.constraintlayout.widget.ConstraintLayou
      t>
```


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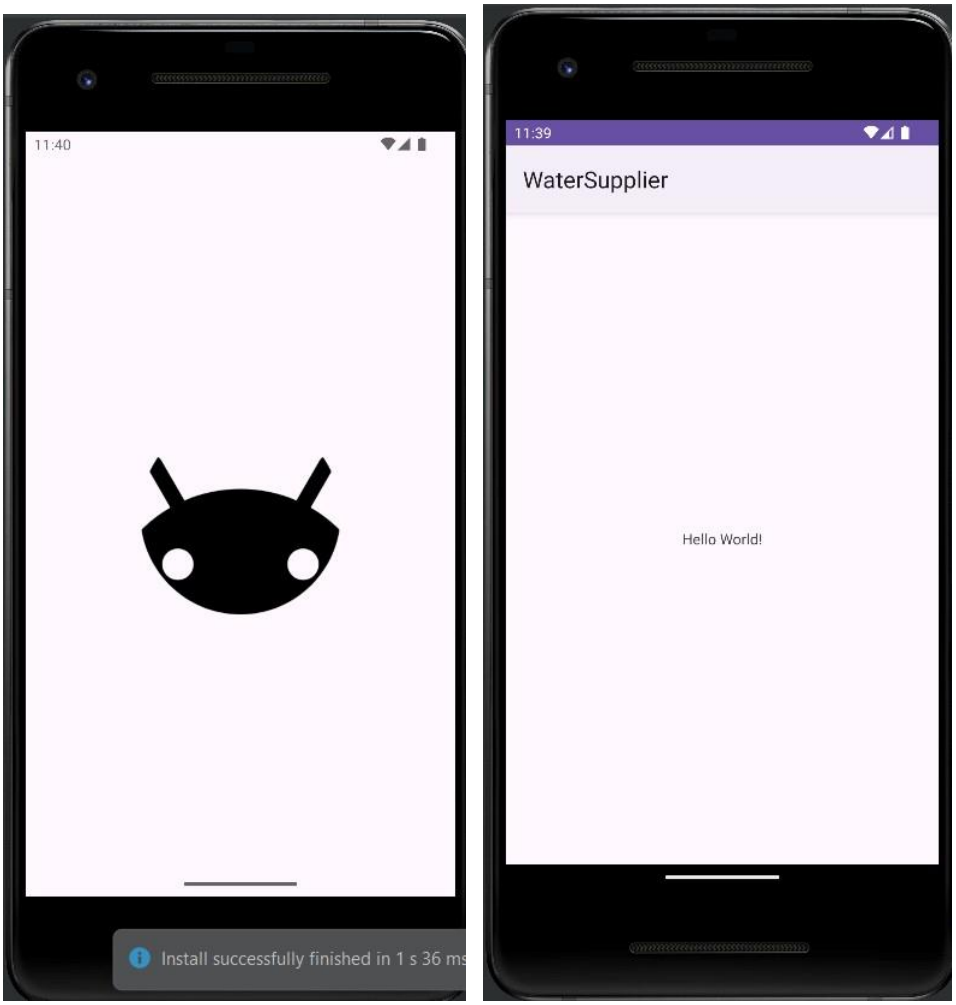
SupplierHomeFragment.java package

```
com.anirudha.watersupplier.supplier; import

androidx.lifecycle.ViewModelProvider; import

android.os.Bundle;

import androidx.annotation.NonNull;
import androidx.annotation.Nullable;
import androidx.fragment.app.Fragment;

import android.view.LayoutInflater; import

android.view.View; import android.view.ViewGroup;

import com.anirudha.watersupplier.R; public class

SupplierHomeFragment extends Fragment { private

SupplierHomeViewModel mViewModel;

   public static SupplierHomeFragment newInstance() {
      return new SupplierHomeFragment();
   }

   @Override
   public View onCreateView(@NonNull LayoutInflater inflater, @Nullable ViewGroup
container,
                            @Nullable Bundle savedInstanceState) {
      return inflater.inflate(R.layout.fragment_supplier_home, container, false);
   }

   @Override
   public void onActivityCreated(@Nullable Bundle savedInstanceState) {
      super.onActivityCreated(savedInstanceState);
      mViewModel = new
ViewModelProvider(this).get(SupplierHomeViewModel.class);
      // TODO: Use the ViewModel
   }
}
```

Output:



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