ATMA RAM SANTAN DHARMA COLLEGE
DELHI UNIVERSITY

PRACTICAL FILE

ANDROID PROGRAMMING

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9.	a) Create an application with three buttons (with different color names) vertically aligned , on selecting a button color of the screen will change. b) Create an application with three buttons horizontally aligned , on selecting a button color of the screen will change.
10.	Create a Login application (check username and password) . On successful login , pop up the message .("Welcome Username ")
11.	Create a login application as above , on successful login redirect to another activity with logout button . On click of logout button a dialog appears with OK and CANCEL button . On OK button click go to login activity and on CANCEL stay at same activity.
12.	Create an application to Create , Insert , Update and Delete operation on the database .

OBJECTIVE :

Create a "Hello World " application that will display "Hello World" in the middle of the screen in the emulator . Also display "Hello World " in the middle of the screen in the android phone.

Code :

Activity_xml

```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:id="@+id/textview"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:background="#9C27B0"
        android:fontFamily="sans-serif-medium"
        android:text="Hello World!"
        android:textSize="24sp"
        android:textStyle="bold"
        app:autoSizeTextType="uniform"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.453" />

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

Main_Activity

```java
package com.example.practical1;

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);
    }
}
```

Practical1

Hello World!

OBJECTIVE:

Create an application to display various android activity lifecycle phases.

Code :

Activity_xml

```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:id="@+id/textview"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Android Activity LifeCycle"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
        android:textColor="#673AB7"
        android:textStyle="bold"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.458"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.172" />

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

MainActivity

```java
package com.example.practical2;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Created",Toast.LENGTH_SHORT);
        toast.show();
    }

    @Override
    protected void onResume() {
```
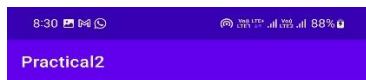
```java
        super.onResume();
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Resumed",Toast.LENGTH_SHORT);
        toast.show();
    }

    @Override
    protected void onPause(){
        super.onPause();
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Paused",Toast.LENGTH_SHORT);
        toast.show();
    }

    @Override
    protected void onStart(){
        super.onStart();
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Started",Toast.LENGTH_SHORT);
        toast.show();
    }


    @Override
    protected void onStop(){
        super.onStop();
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Stopped",Toast.LENGTH_SHORT);
        toast.show();
    }


    @Override
    protected void onDestroy(){
        super.onDestroy();
        Toast toast = Toast.makeText(getApplicationContext(),"Activity
Destroyed",Toast.LENGTH_SHORT);
        toast.show();
    }
}
```
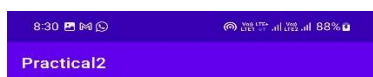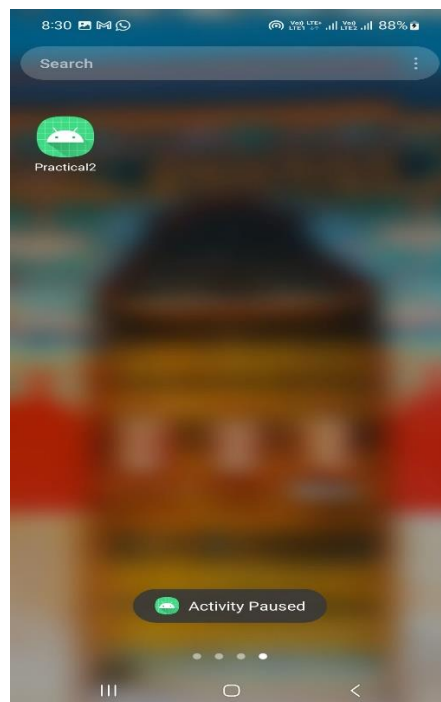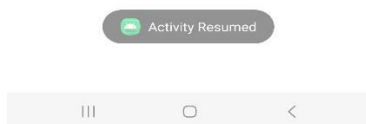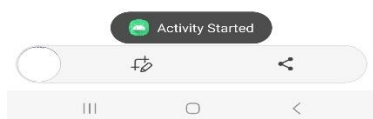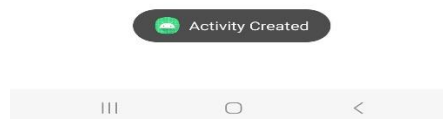
Practical2

Android Activity LifeCycle

Activity Resumed

Activity Paused

Practical2

Android Activity LifeCycle

Activity Started

Practical2

Android Activity LifeCycle

Activity Created

OBJECTIVE :

Create an application with first activity with an editText and send button. On click of send button , make use of explicit intent to send text to second activity and display there in textview.

Code:

Activity_main.xml

```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">

    <EditText
        android:id="@+id/editText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPersonName"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.314" />

    <Button
        android:id="@+id/sendButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SUBMIT"
        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/editText"
        app:layout_constraintVertical_bias="0.189" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Second_activity.xml

```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=".Second_Activity">
```

```xml
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:fontFamily="sans-serif-black"
        android:textAlignment="center"
        android:textAppearance="@style/TextAppearance.AppCompat.Display3"
        android:textColor="#4CAF50"
        android:textSize="60sp"
        android:textStyle="bold"
        android:typeface="serif"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.258" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.practical3;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    private Button btn ;
    private EditText editText;
    private String str;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btn=findViewById(R.id.sendButton);
        editText = findViewById(R.id.editText);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(MainActivity.this ,
SecondActivity.class);
                str = editText.getText().toString();
                intent.putExtra("value",str);
                startActivity(intent);
                finish();
            }
        });
    }
}
```

SecondActivity.java

```java
package com.example.practical3;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.TextView;

public class SecondActivity extends AppCompatActivity {
    private TextView textView;
    private String str;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);
        textView =findViewById(R.id.textView);
        str= getIntent().getExtras().getString("value");
        textView.setText(str);
    }
}
```
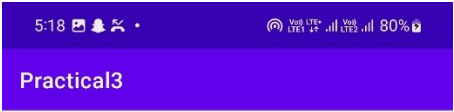

5:18 🔔 ✂ 🗐 •   🅐 VoⱰ LTE⁺ ⱠⱠⱠ VoⱰ ⱠⱠⱠ 80% 🔋
LTE1 Ⱡ⁺ LTE2

Practical3

Hello There

SUBMIT

||| ◯   <

Practical3

Hello There

OBJECTIVE:

Create an application with first activity with an editText and send button . On click of send button , make use of implicit intent that uses a SEND ACTION and let user select app from app chooser and navigate to that application.

Code:

Activity_main.xml

```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">

    <Button
        android:id="@+id/share"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Share Text"
        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="0.442" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.practical4;

import static com.example.practical4.R.id.share;

import androidx.appcompat.app.AppCompatActivity;

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

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
      Button btn= findViewById(R.id.share);
        btn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```java
            Intent intent = new Intent(Intent.ACTION_SEND);
            intent.setType("text/plain");
            intent.putExtra(Intent.EXTRA_TEXT,"Hello There");
            startActivity(intent.createChooser(intent , "Share"));
        }
    });

    }
}
```
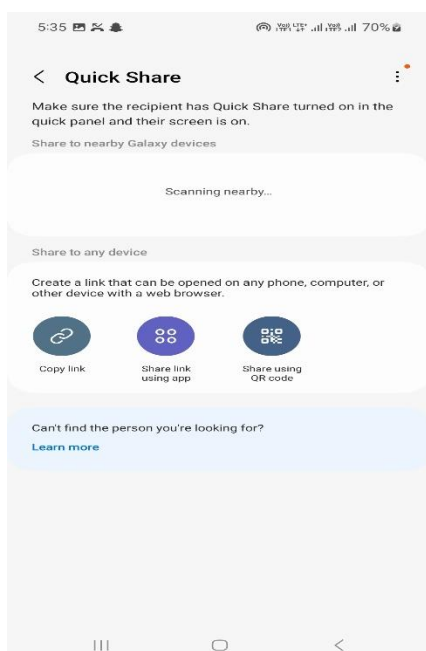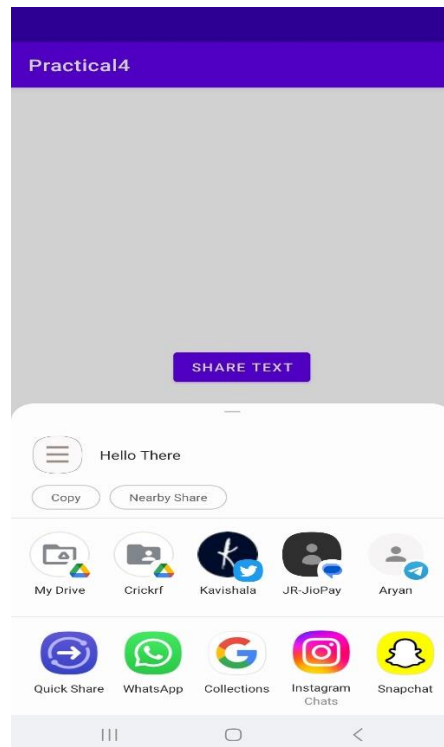
OBJECTIVE:

Create spinner with strings taken from resource folder (res>> value folder) and on changing the spinner value , image will change.

Code:

Activity_main.xml

```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">

    <Spinner
        android:id="@+id/spin"
        android:layout_width="409dp"
        android:layout_height="wrap_content"
        android:contentDescription="@string/value0"
        android:minHeight="48dp"
        android:spinnerMode="dropdown"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="1.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.045" />

    <ImageView
        android:id="@+id/imageview"
        android:layout_width="410dp"
        android:layout_height="397dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.461"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/spin"
        app:layout_constraintVertical_bias="0.283"
        tools:srcCompat="@color/white" />

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

MainActivity.java

```java
package com.example.practical5;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
```
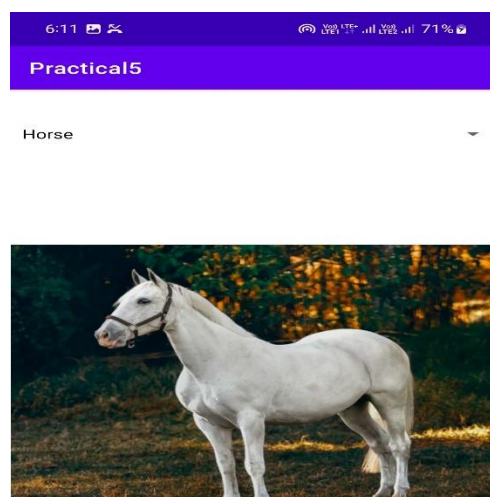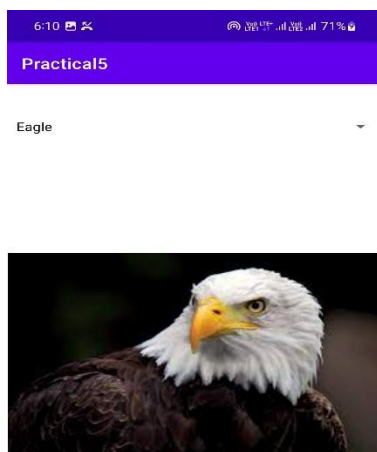
```java
import android.widget.ArrayAdapter;
import android.widget.ImageView;
import android.widget.Spinner;

public class MainActivity extends AppCompatActivity {
    private Spinner spinner;
    private ImageView imageView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        spinner = findViewById(R.id.spin);
        imageView = findViewById(R.id.imageview);
        String [] birds = {"Select One" , "Flamingo" , "Eagle","Horse"
,"Tiger"};
        ArrayAdapter<String> adapter = new ArrayAdapter<String>(this,
android.R.layout.simple_spinner_dropdown_item,birds);
        spinner.setAdapter(adapter);
        spinner.setOnItemSelectedListener(new
AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parent, View view,
int position, long id) {
                switch (position){
                    case 1:
                        imageView.setImageResource(R.drawable.flamingo);
                        break;
                    case 2:
                        imageView.setImageResource(R.drawable.eagle);
                        break;
                    case 3:
                        imageView.setImageResource(R.drawable.horse);
                        break;
                    case 4:
                        imageView.setImageResource(R.drawable.tiger);
                        break;
                }
            }

            @Override
            public void onNothingSelected(AdapterView<?> parent) {
            }
        });
    }
}
```

6:10 Practical5

Select One
Flamingo
Eagle
Horse
Tiger

6:10 Practical5

Flamingo

6:10 Practical5

Eagle

6:11 Practical5

Horse
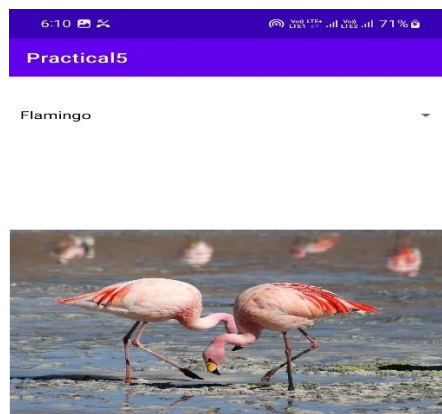
OBJECTIVE:

Create a menu with 5 options and selected option should appear in text box in upper case.

Code:

Activity_main.xml

```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">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        tools:layout_editor_absoluteX="61dp"
        tools:layout_editor_absoluteY="145dp">

        <EditText
            android:id="@+id/menuitem"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_alignParentTop="true"
            android:layout_alignParentBottom="true"
            android:layout_marginTop="299dp"
            android:layout_marginBottom="387dp"
            android:ems="10"
            android:gravity="center_horizontal"
            android:hint="Select an Option from the Item"
            android:inputType="textPersonName"
            android:textAlignment="center" />
    </RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

Main_menu.xml

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

    <item
        android:id="@+id/settings"
        android:title="@string/settings" />
    <item
        android:id="@+id/backup"
        android:title="@string/backup" />
    <item
        android:id="@+id/reset"
        android:title="@string/reset" />
    <item
        android:id="@+id/about"
```

```xml
        android:title="@string/about" />
    <item
        android:id="@+id/help"
        android:title="@string/help" />
</menu>
```

Strings.xml

```xml
<resources>
    <string name="app_name">Practical6</string>
    <string name="backup">Backup</string>
    <string name="settings">Settings</string>
    <string name="reset">Reset</string>
    <string name="about">About</string>
    <string name="help">Help</string>
</resources>
```

MainActivity.java

```java
package com.example.practical6;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.Menu;
import android.view.MenuInflater;
import android.view.MenuItem;
import android.widget.EditText;

public class MainActivity extends AppCompatActivity {
    private EditText editText;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        editText =(EditText) findViewById(R.id.menuitem);

    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu){
        MenuInflater inflater = getMenuInflater();
        inflater.inflate(R.menu.main_menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item){
        editText.setText(item.getTitle().toString().toUpperCase());
        return super.onOptionsItemSelected(item);
    }
}
```

Practical6 Settings / Backup / Reset / About / Help	**Practical6**
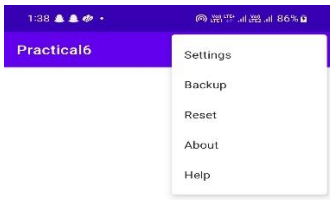
Select an Option from the Item

SETTINGS

BACKUP

RESET

ABOUT

HELP

OBJECTIVE:

Create a radio button group with radio button of all courses in your college and on selecting a particular course , teacher-in-charge of that course should appear at the bottom of the screen.

Code:

Activity_main.xml

```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">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        >

        <RadioGroup
            android:id="@+id/courses"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_centerInParent="true"
             />
    </RelativeLayout>
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.practical7;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.RadioButton;
import android.widget.RadioGroup;

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

import java.util.HashMap;

public class MainActivity extends AppCompatActivity {
    private RadioGroup radioGroup;
    private HashMap<String,String> coursesMap;
```

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

    private void initCourses(){
        radioGroup =(RadioGroup)findViewById(R.id.courses);
        if(coursesMap ==null){
            coursesMap = new HashMap<>();
            coursesMap.put("BSC(Hons) Computer Science", "Dr.V.S. Dixit");
            coursesMap.put("BCOM (Hons)","Dr. Manika Jain");
            coursesMap.put("BA (Hons)","Dr.Arpa Sinha");
            for (String course: coursesMap.keySet()
                 ) {
                RadioButton radioButton = new
RadioButton(MainActivity.this);
                radioButton.setText(course);
                radioGroup.addView(radioButton);
            }

            radioGroup.setOnCheckedChangeListener(new
RadioGroup.OnCheckedChangeListener() {
                @Override
                public void onCheckedChanged(RadioGroup group, int
checkedId) {
                    int checkedRadioButtonid =
radioGroup.getCheckedRadioButtonId();
                    RadioButton rbutton = (RadioButton)
findViewById(checkedRadioButtonid);


Snackbar.make(radioGroup,coursesMap.get(rbutton.getText()),Snackbar.LENGTH_
SHORT).show();
                }
            });
        }
    }
}
```
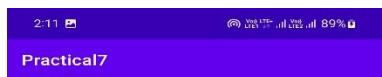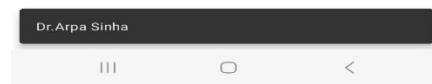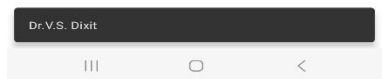
○ BA (Hons)
○ BSC(Hons) Computer Science
○ BCOM (Hons)

◉ BA (Hons)
○ BSC(Hons) Computer Science
○ BCOM (Hons)

Dr.Arpa Sinha

○ BA (Hons)
◉ BSC(Hons) Computer Science
○ BCOM (Hons)

Dr.V.S. Dixit

○ BA (Hons)
○ BSC(Hons) Computer Science
◉ BCOM (Hons)

Dr. Manika Jain

OBJECTIVE:

Create a list of all Courses in your college and on selecting a particular course parent department and the teacher-in-charge of that department should appear at the bottom of the screen.

Code:

Activity_main.xml

```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">

    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_margin="75dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        >

    <RadioGroup
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:id ="@+id/courses"
        android:layout_centerInParent="true">

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

MainActivity.java

```java
package com.example.practical8;

import androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.widget.RadioButton;
import android.widget.RadioGroup;

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

import java.util.HashMap;

public class MainActivity extends AppCompatActivity {
private RadioGroup rgcourses;
private HashMap<String,String> coursesMap;
```

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

    private void initCourses(){
        rgcourses =(RadioGroup) findViewById(R.id.courses);
        if(coursesMap ==null){
            coursesMap = new HashMap<>();
            coursesMap.put("BSC(Hons) Computer Science","Dept. of Computer
Science - Dr. V.S. Dixit");
            coursesMap.put("BCOM(Hons)","Dept. of Commerce - Dr. Manika
Jain");
            coursesMap.put("BA(Hons)" , "Dept. of Economics - Dr.Apra
Sinha");
            for(String course : coursesMap.keySet()){
                RadioButton radioButton = new
RadioButton(MainActivity.this);
                radioButton.setText(course);
                rgcourses.addView(radioButton);
            }

            rgcourses.setOnCheckedChangeListener(new
RadioGroup.OnCheckedChangeListener() {
                @Override
                public void onCheckedChanged(RadioGroup group, int
checkedId) {
                    int checkedRadioButtonid =
rgcourses.getCheckedRadioButtonId();
                    RadioButton rbutton = (RadioButton)
findViewById(checkedRadioButtonid);

Snackbar.make(rgcourses,coursesMap.get(rbutton.getText()),Snackbar.LENGTH_S
HORT).show();
                }
            });
        }

    }
}
```
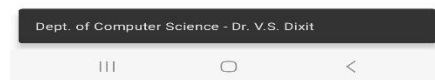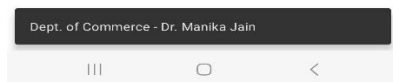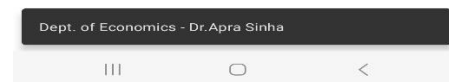
○ BSC(Hons) Computer Science
○ BCOM(Hons)
○ BA(Hons)

◉ BSC(Hons) Computer Science
○ BCOM(Hons)
○ BA(Hons)

Dept. of Computer Science - Dr. V.S. Dixit

○ BSC(Hons) Computer Science
◉ BCOM(Hons)
○ BA(Hons)

Dept. of Commerce - Dr. Manika Jain

○ BSC(Hons) Computer Science
○ BCOM(Hons)
◉ BA(Hons)

Dept. of Economics - Dr.Apra Sinha

OBJECTIVE:

a) Create an application with three buttons (with different color names) vertically aligned , on selecting a button color of the screen will change.

b) Create an application with three buttons horizontally aligned , on selecting a button color of the screen will change.

Code:

a) Activity_main.xml

```xml
b) <?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:id ="@+id/layoutSuperParent"
       tools:context=".MainActivity">

       <LinearLayout
           android:layout_width="wrap_content"
           android:layout_height="wrap_content"
           android:orientation="vertical"
           app:layout_constraintBottom_toBottomOf="parent"
           app:layout_constraintLeft_toLeftOf="parent"
           app:layout_constraintRight_toRightOf="parent"
           app:layout_constraintTop_toTopOf="parent"
           >
           <Button
               android:layout_width="150dp"
               android:layout_height="wrap_content"
               android:id="@+id/btnRed"
               android:layout_gravity="center"
               android:backgroundTint="@android:color/holo_red_dark"
               android:text="RED"/>
           <Button
               android:layout_width="150dp"
               android:layout_height="wrap_content"
               android:id="@+id/btnBlue"
               android:layout_gravity="center"
               android:backgroundTint="@android:color/holo_blue_light"
               android:text="BLUE"/>
           <Button
               android:layout_width="150dp"
               android:layout_height="wrap_content"
               android:id="@+id/btnGreen"
               android:gravity="center"
               android:backgroundTint="@android:color/holo_green_dark"
               android:text="GREEN"/>
           <Button
               android:layout_width="150dp"
               android:layout_height="wrap_content"
               android:id="@+id/btnReset"
```

```
                    android:text="Reset"
                    android:gravity="center"/>

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

MainActivity.java

```java
package com.example.practical9;

import androidx.appcompat.app.AppCompatActivity;
import androidx.constraintlayout.widget.ConstraintLayout;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener{
    private Button btnRed;
    private Button btnBlue;
    private Button btnGreen;
    private Button btnReset;
    private ConstraintLayout layoutSuperParent;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

layoutSuperParent=(ConstraintLayout)findViewById(R.id.layoutSuperParent);
        btnRed=(Button)findViewById(R.id.btnRed);
        btnBlue=(Button)findViewById(R.id.btnBlue);
        btnGreen=(Button)findViewById(R.id.btnGreen);
        btnReset=(Button)findViewById(R.id.btnReset);
        btnRed.setOnClickListener(this);
        btnBlue.setOnClickListener(this);
        btnGreen.setOnClickListener(this);
        btnReset.setOnClickListener(this);
    }

    @Override
    public void onClick(View v){
        switch (v.getId()){
            case R.id.btnRed:
                layoutSuperParent.setBackgroundColor(Color.RED);
                break;
            case R.id.btnBlue:
                layoutSuperParent.setBackgroundColor(Color.BLUE);
                break;
            case R.id.btnGreen:
                layoutSuperParent.setBackgroundColor(Color.GREEN);
                break;
            case R.id.btnReset:
                layoutSuperParent.setBackgroundColor(Color.TRANSPARENT);
                break;
            default:
                break;
        }
```
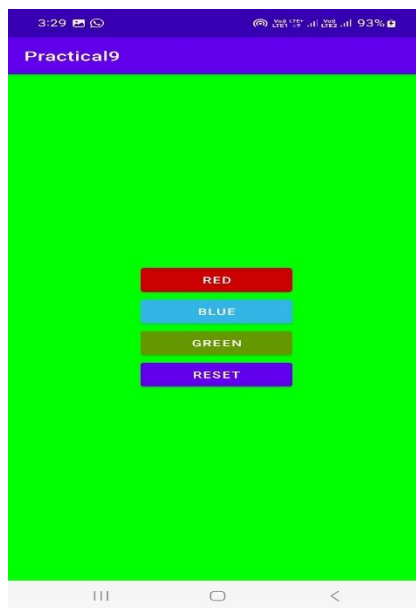
```
        }
}
```

b)

activity_main.xml

```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:id ="@+id/layoutSuperParent"
    tools:context=".MainActivity">

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        >
        <Button
            android:layout_width="150dp"
            android:layout_height="wrap_content"
            android:id="@+id/btnRed"
            android:layout_gravity="center"
            android:backgroundTint="@android:color/holo_red_dark"
            android:text="RED"/>
        <Button
            android:layout_width="150dp"
            android:layout_height="wrap_content"
            android:id="@+id/btnBlue"
            android:layout_gravity="center"
            android:backgroundTint="@android:color/holo_blue_light"
            android:text="BLUE"/>
        <Button
            android:layout_width="150dp"
            android:layout_height="wrap_content"
            android:id="@+id/btnGreen"
            android:gravity="center"
            android:backgroundTint="@android:color/holo_green_dark"
            android:text="GREEN"/>
        <Button
            android:layout_width="150dp"
            android:layout_height="wrap_content"
            android:id="@+id/btnReset"
            android:text="Reset"
            android:gravity="center"/>

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

MainActivity.java

```java
package com.example.practical9;
```

```java
import androidx.appcompat.app.AppCompatActivity;
import androidx.constraintlayout.widget.ConstraintLayout;

import android.graphics.Color;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity implements
View.OnClickListener{
    private Button btnRed;
    private Button btnBlue;
    private Button btnGreen;
    private Button btnReset;
    private ConstraintLayout layoutSuperParent;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

layoutSuperParent=(ConstraintLayout)findViewById(R.id.layoutSuperParent);
        btnRed=(Button)findViewById(R.id.btnRed);
        btnBlue=(Button)findViewById(R.id.btnBlue);
        btnGreen=(Button)findViewById(R.id.btnGreen);
        btnReset=(Button)findViewById(R.id.btnReset);
        btnRed.setOnClickListener(this);
        btnBlue.setOnClickListener(this);
        btnGreen.setOnClickListener(this);
        btnReset.setOnClickListener(this);
    }

    @Override
    public void onClick(View v){
        switch (v.getId()){
            case R.id.btnRed:
                layoutSuperParent.setBackgroundColor(Color.RED);
                break;
            case R.id.btnBlue:
                layoutSuperParent.setBackgroundColor(Color.BLUE);
                break;
            case R.id.btnGreen:
                layoutSuperParent.setBackgroundColor(Color.GREEN);
                break;
            case R.id.btnReset:
                layoutSuperParent.setBackgroundColor(Color.TRANSPARENT);
                break;
            default:
                break;
        }
    }
}
```
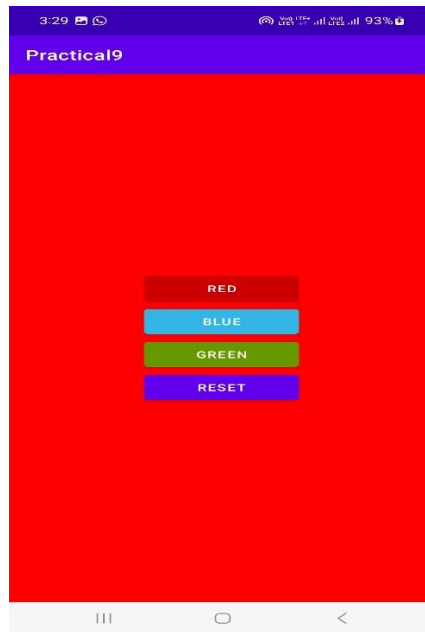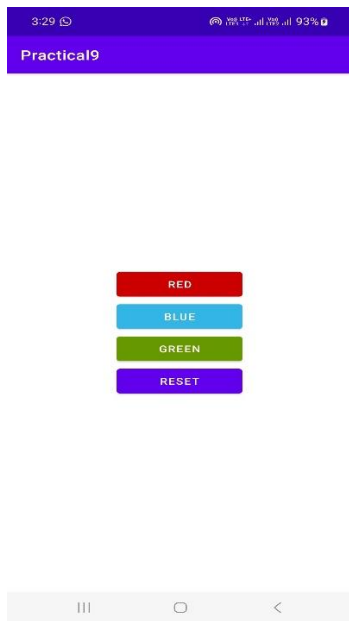
OBJECTIVE:

Create a Login application (check username and password) . On successful login , pop up the message .("Welcome Username ")

Code:

Activity_main.xml

```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">
    <EditText
        android:id="@+id/etEmail"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="240dp"
        android:autofillHints="false"
        android:ems="10"
        android:hint="@string/e_mail_id"
        android:inputType="textEmailAddress"
        app:layout_constraintBottom_toTopOf="@id/etPassword"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <EditText
        android:id="@+id/etPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:autofillHints="false"
        android:ems="10"
        android:hint="@string/password"
        android:inputType="textPassword"
        app:layout_constraintBottom_toTopOf="@id/btnLogin"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/etEmail" />
    <Button
        android:id="@+id/btnLogin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="30dp"
        android:text="@string/login"
        app:layout_constraintBottom_toTopOf="@id/btnRegister"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/etPassword" />
    <Button
        android:id="@+id/btnRegister"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="250dp"
        android:text="@string/register"
```

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

Strings.xml

```xml
<resources>
    <string name="app_name">Practical10</string>
    <string name="welcome">Welcome</string>
    <string name="log_out">Log Out</string>
    <string name="password">Password</string>
    <string name="e_mail_id">E-mail ID</string>
    <string name="login">Login</string>
    <string name="register">Register</string>
    <string name="cancel">Cancel</string>
    <string name="ok">Ok</string>
</resources>
```

User.java

```java
package com.example.practical10;
import androidx.annotation.NonNull;
import androidx.room.ColumnInfo;
import androidx.room.Entity;
import androidx.room.PrimaryKey;

@Entity
public class User {
    @PrimaryKey
    @NonNull
    @ColumnInfo(name = "email")
    public String email;
    @NonNull
    @ColumnInfo(name = "password")
    public String password;
    public User(@NonNull String email, @NonNull String password) {
        this.email = email;
        this.password = password;
    }
}
```

UserDao.java

```java
package com.example.practical10;

import androidx.room.Dao;
import androidx.room.Delete;
import androidx.room.Insert;
import androidx.room.Query;
import java.util.List;
import
        com.example.practical10.User;
```

```
@Dao
public interface UserDao {
    @Query("SELECT * FROM user")
    List<User> getAll();
    @Query("SELECT * FROM user WHERE email LIKE :email LIMIT 1")
    User findByEmail(String email);
    @Insert
    void insert(User user);
    @Delete
    void delete(User user);
}
```

UserService.java

```java
package com.example.practical10;

import android.content.Context;

import androidx.room.Room;

public class UserService {
    private User user = null;
    private static UserService instance = null;
    private static UserDatabase database = null;
    public void login(User user) throws IllegalStateException {
        User u = database.userDao().findByEmail(user.email);
        if (!u.password.equals(user.password))
            throw new IllegalStateException("Password Mismatch");
        this.user = user;
    }
    public void register(User user) {
        database.userDao().insert(user);
        this.user = user;
    }
    public void logout() {
        this.user = null;
    }
    public User getUser() {
        return user;
    }
    public static UserService getInstance() {
        if (instance == null) {
            instance = new UserService();
        }
        return instance;
    }
    public static void initDatabase(Context ctx) {
        if (database == null) {
            database = Room
                    .databaseBuilder(ctx, UserDatabase.class,
"login_module")
                    .allowMainThreadQueries()
                    .build();
        }
    }
}
```

UserDatabase.java

```java
package com.example.practical10;

import androidx.room.Database;
import androidx.room.RoomDatabase;

@Database(entities = {User.class}, version = 1)
public abstract class UserDatabase extends RoomDatabase {
    public abstract UserDao userDao();
}
```

MainActivity.java

```java
package com.example.practical10;

import androidx.appcompat.app.AppCompatActivity;

import android.database.sqlite.SQLiteConstraintException;
import android.os.Bundle;
import android.util.Log;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    private EditText etEmail;
    private EditText etPassword;
    private Button btnLogin;
    private Button btnRegister;
    private UserService userService;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        userService = UserService.getInstance();
        UserService.initDatabase(this);
        etEmail = (EditText) findViewById(R.id.etEmail);
        etPassword = (EditText) findViewById(R.id.etPassword);
        btnLogin = (Button) findViewById(R.id.btnLogin);
        btnRegister = (Button) findViewById(R.id.btnRegister);
        btnLogin.setOnClickListener(v -> {
            User user = validateCredentials();
            if (user != null) {
                try {
                    userService.login(user);
                    Toast.makeText(this, "Welcome " +
userService.getUser().email, Toast.LENGTH_SHORT).show();
                } catch (IllegalStateException illegalStateException) {
                    Toast.makeText(this, "Invalid Email/ Password",
Toast.LENGTH_SHORT).show();
                } catch (Exception e) {
                    Log.d("TAG", e.getMessage());
                    Toast.makeText(this, "Error",
Toast.LENGTH_SHORT).show();
                }
            }
        });
        btnRegister.setOnClickListener(v -> { User user
                = validateCredentials(); if (user != null) {
            try {
```

```
                userService.register(user);
                Toast.makeText(this, "Registered",
Toast.LENGTH_SHORT).show();
            } catch (SQLiteConstraintException sqLiteConstraintException)
            {
                Toast.makeText(this, "Email Already Used",
Toast.LENGTH_SHORT).show();
            } catch (Exception e) {
                Toast.makeText(this, "Error", Toast.LENGTH_SHORT).show();
            }
        }
    });
    }
    private User validateCredentials() {
        String email = etEmail.getText().toString().trim();
        String password = etPassword.getText().toString().trim();
        if (email.length() == 0) {
            etEmail.setError("Enter your e-mail address");
            return null;
        }
        if (password.length() == 0) {
            etPassword.setError("Enter your password");
            return null;
        }
        return new User(email, password);
    }
}
```

Output:
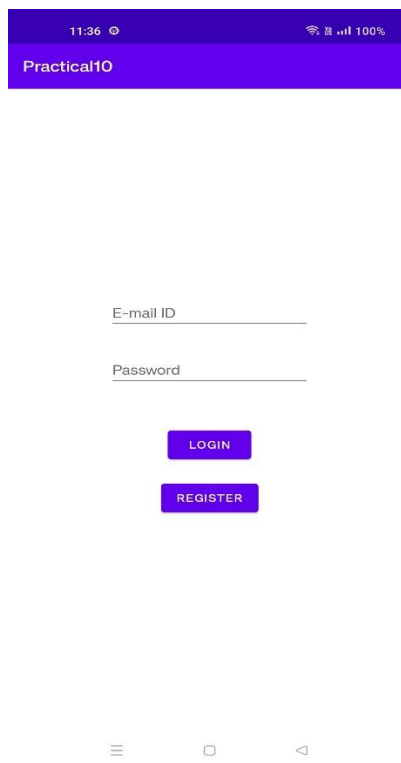
piyush@gmail.com

••••••

LOGIN

REGISTER

☁ Registered

≡ □ ◁

piyush@gmail.com

••••••

LOGIN

REGISTER

☁ Welcome piyush@gmail.com

≡ □ ◁

OBJECTIVE: Create a login application as above , on successful login redirect to another activity with logout button . On click of logout button a dialog appears with OK and CANCEL button . On OK button click go to login activity and on CANCEL stay at same activity.

CODE:

Android_Manifest.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.practical11">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.MaterialComponents"
        >
        <activity
            android:name=".MemberModule"
            android:exported="true" />
        <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>
```

Strings.xml

```xml
<resources>
    <string name="app_name">Practical11</string>
    <string name="welcome">Welcome</string>
    <string name="log_out">Log Out</string>
    <string name="password">Password</string>
    <string name="e_mail_id">E-mail ID</string>
    <string name="login">Login</string>
    <string name="register">Register</string>
    <string name="cancel">Cancel</string>
    <string name="ok">Ok</string>
</resources>
```

Activity_Main.xml

```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">

    <EditText
        android:id="@+id/etEmail"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="240dp"
        android:autofillHints="false"
        android:ems="10"
        android:hint="@string/e_mail_id"
        android:inputType="textEmailAddress"
        app:layout_constraintBottom_toTopOf="@id/etPassword"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <EditText
        android:id="@+id/etPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:autofillHints="false"
        android:ems="10"
        android:hint="@string/password"
        android:inputType="textPassword"
        app:layout_constraintBottom_toTopOf="@id/btnLogin"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/etEmail" />
    <Button
        android:id="@+id/btnLogin"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="30dp"
        android:text="@string/login"
        app:layout_constraintBottom_toTopOf="@id/btnRegister"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/etPassword" />
    <Button
        android:id="@+id/btnRegister"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="250dp"
        android:text="@string/register"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/btnLogin" />

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

MemberModule_activity.xml

```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=".MemberModule">
    <TextView
        android:id="@+id/tvWelcome"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/welcome"
        android:textAppearance="@style/TextAppearance.AppCompat.Display1"
        app:layout_constraintBottom_toTopOf="@id/tvEmail"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
    <TextView
        android:id="@+id/tvEmail"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        app:layout_constraintBottom_toTopOf="@id/btnLogout"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@id/tvWelcome" />
    <Button
        android:id="@+id/btnLogout"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="@string/log_out"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/tvEmail" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```java
package com.example.practical11;
import android.content.Intent;
import android.database.sqlite.SQLiteConstraintException;
import android.os.Bundle;
import android.util.Log;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;



public class MainActivity extends AppCompatActivity {
    private EditText etEmail;
```

```java
    private EditText etPassword;
    private Button btnLogin;
    private Button btnRegister;
    private UserService userService;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        userService = UserService.getInstance();
        UserService.initDatabase(this);
        etEmail = (EditText) findViewById(R.id.etEmail);
        etPassword = (EditText) findViewById(R.id.etPassword);
        btnLogin = (Button) findViewById(R.id.btnLogin);
        btnRegister = (Button) findViewById(R.id.btnRegister);
        btnLogin.setOnClickListener(v -> {
            User user = validateCredentials();
            if (user != null){
                try {
                    userService.login(user);
                    Toast.makeText(this, "Logged In",
Toast.LENGTH_SHORT).show();
                    startActivity(new Intent(this, MemberModule.class));
                } catch (IllegalStateException illegalStateException) {
Toast.makeText(this,
                    "Invalid E- mail/Password",
Toast.LENGTH_SHORT).show();
                } catch (Exception e) {
                    Log.d("TAG", e.getMessage());
                    Toast.makeText(this, "Error",
Toast.LENGTH_SHORT).show();}
            }
        }); btnRegister.setOnClickListener(v -> { User
            user = validateCredentials(); if (user !=
            null) {
            try {
                userService.register(user);
                Toast.makeText(this, "Registered",
Toast.LENGTH_SHORT).show();
                startActivity(new Intent(this, MemberModule.class));
            } catch (SQLiteConstraintException sqLiteConstraintException)
            {
                Toast.makeText(this, "E-mail Already Used",
                        Toast.LENGTH_SHORT).show();
            } catch (Exception e) {
                Toast.makeText(this, "Error", Toast.LENGTH_SHORT).show();
            }
        }
        });
    }
    private User validateCredentials() {
        String email = etEmail.getText().toString().trim();
        String password = etPassword.getText().toString().trim();
        if (email.length() == 0) {
            etEmail.setError("Enter your e-mail address");
            return null;
        }
        if (password.length() == 0) {
            etPassword.setError("Enter your password");
            return null;
        }
        return new User(email, password);
```

```
        }
}
```

MemberModule.java

```java
package com.example.practical11;

import android.app.AlertDialog;
import android.os.Bundle;
import android.widget.TextView;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import com.example.practical11.R;
import com.example.practical11.UserService;

public class MemberModule extends AppCompatActivity {
    private User user;
    private UserService userService;
    private TextView tvEmail;
    private TextView btnLogout;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_member_module);
        userService = UserService.getInstance();
        user = userService.getUser();
        tvEmail = (TextView) findViewById(R.id.tvEmail);
        btnLogout = (TextView) findViewById(R.id.btnLogout);
        if (user == null) {
            super.finish();
        } else {
            tvEmail.setText(user.email);
        }
        btnLogout.setOnClickListener(v -> {
            new AlertDialog.Builder(this)
                    .setTitle("Logout")
                    .setMessage("Are you sure you want to log out?")
                    .setPositiveButton(android.R.string.ok, (dialog, which)
-> logoutUser()).setNegativeButton(android.R.string.cancel, null)
                    .setIcon(android.R.drawable.ic_dialog_alert)
                    .show();
        });
    }
    private void logoutUser() {
        userService.logout();
        Toast.makeText(this, "Logged Out", Toast.LENGTH_SHORT).show();
        super.finish();
    }
}
```

User.java

```java
package com.example.practical11;

import androidx.annotation.NonNull;
import androidx.room.ColumnInfo;
import androidx.room.Entity;
```

```
import androidx.room.PrimaryKey;
@Entity
public class User {
    @PrimaryKey
    @NonNull
    @ColumnInfo(name = "email")
    public String email;
    @NonNull
    @ColumnInfo(name = "password")
    public String password;
    public User(@NonNull String email, @NonNull String password) {
        this.email = email;
        this.password = password;
    }
}
```

UserDao.java

```
package com.example.practical11;

import androidx.room.Dao;
import androidx.room.Delete;
import androidx.room.Insert;
import androidx.room.Query;
import java.util.List;

@Dao
public interface UserDao {
    @Query("SELECT * FROM user")
    List<User> getAll();
    @Query("SELECT * FROM user WHERE email LIKE :email LIMIT 1")
    User findByEmail(String email);
    @Insert
    void insert(User user);
    @Delete
    void delete(User user);
}
```

UserDatabase.java

```
package com.example.practical11;

import androidx.room.RoomDatabase;
import androidx.room.Database;

@Database(entities = {User.class}, version = 1)
public abstract class UserDatabase extends RoomDatabase {
    public abstract UserDao userDao();
}
```
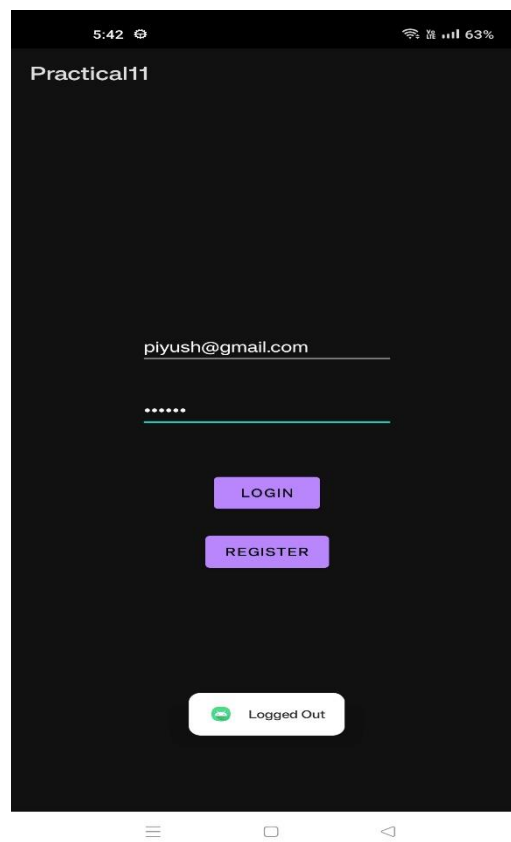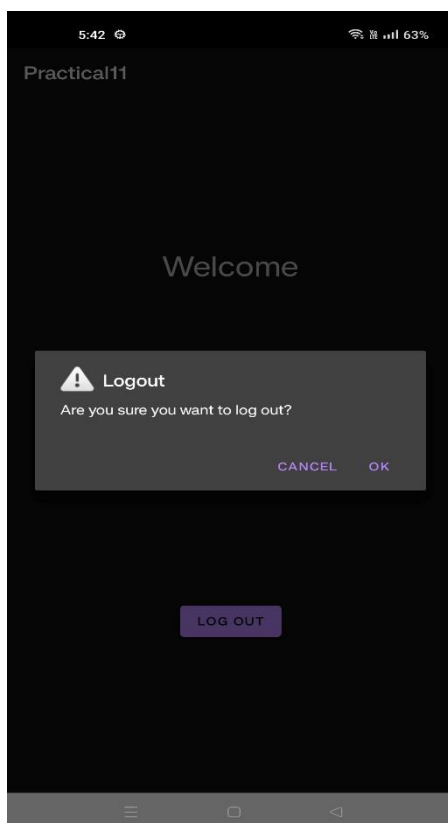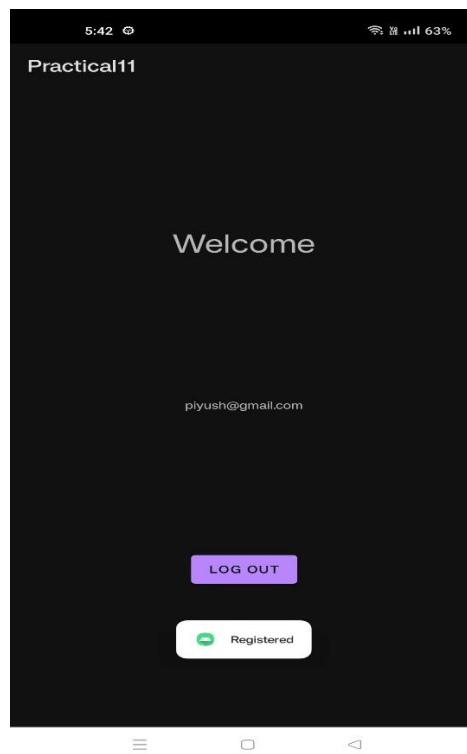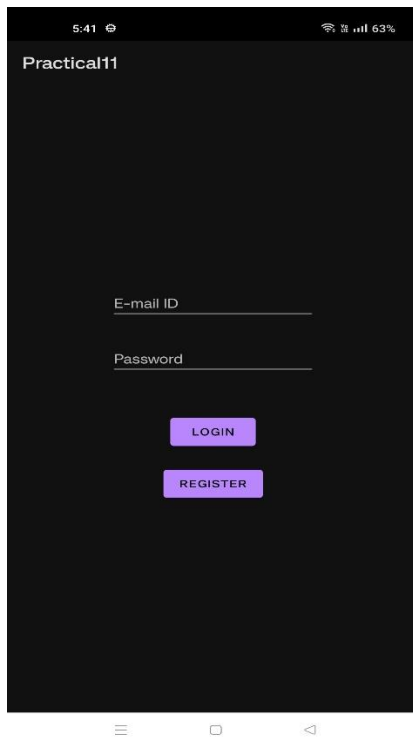
UserService.java

```java
package com.example.practical11;

import android.content.Context;
import androidx.room.Room;

public class UserService {
    private User user = null;
    private static UserService instance = null;
    private static UserDatabase database = null;
    public void login(User user) throws IllegalStateException {
        User u = database.userDao().findByEmail(user.email);
        if (!u.password.equals(user.password))
            throw new IllegalStateException("Password Mismatch");
        this.user = user;
    }
    public void register(User user) {
        database.userDao().insert(user);
        this.user = user;
    }
    public void logout() {
        this.user = null;
    }
    public User getUser() {
        return user;
    }
    public static UserService getInstance() {
        if (instance == null) {
            instance = new UserService();
        }
        return instance;
    }
    public static void initDatabase(Context ctx) {
        if (database == null) {
            database = Room
                    .databaseBuilder(ctx, UserDatabase.class,
"login_module")
                    .allowMainThreadQueries()
                    .build();
        }
    }
}
```

OBJECTIVE: Create an application to Create , Insert , Update and Delete operation on the database .

OUTPUT:

Activity_main.xml

```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/clRoot"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <androidx.swiperefreshlayout.widget.SwipeRefreshLayout
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:id="@+id/swipeLayout"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent">
        <androidx.recyclerview.widget.RecyclerView
            android:id="@+id/rvTodos"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content" />
    </androidx.swiperefreshlayout.widget.SwipeRefreshLayout>
    <com.google.android.material.floatingactionbutton.FloatingActionButton
        android:id="@+id/fabAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_gravity="end|bottom"
        android:layout_margin="16dp"
        android:src="@drawable/ic_launcher_foreground"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

Dialog_layout.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:paddingHorizontal="20dp"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <EditText
        android:id="@+id/etNewContent"
        android:inputType="text"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Content" />
</LinearLayout>
```

Todo_item.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<com.google.android.material.card.MaterialCardView
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    android:id="@+id/cvParent"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_marginHorizontal="@dimen/card_margin"
    android:layout_marginTop="@dimen/card_margin"
    app:cardCornerRadius="@dimen/cardview_default_radius"
    app:cardElevation="@dimen/cardview_default_elevation">
    <RelativeLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="@dimen/default_card_content_margin">
        <TextView
            android:id="@+id/tvTodoId"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:visibility="invisible" />
        <TextView
            android:id="@+id/tvTodoContent"
            style="@style/TextAppearance.MaterialComponents.Headline6"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="@string/default_todo_content" />
        <TextView
            android:id="@+id/tvTodoAddedAt"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_below="@id/tvTodoContent"
            android:layout_marginVertical="5dp"
            android:text="@string/default_todo_added_at" />
        <LinearLayout
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_below="@id/tvTodoAddedAt"
            android:orientation="horizontal">
            <Button
                android:id="@+id/btnTodoAction"

style="@style/Widget.MaterialComponents.Button.OutlinedButton"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="@string/default_todo_action" />
            <Button
                android:id="@+id/btnTodoDelete"

style="@style/Widget.MaterialComponents.Button.OutlinedButton"
                android:textColor="@android:color/holo_red_dark"
                android:layout_marginStart="10dp"
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="@string/default_todo_delete" />
        </LinearLayout>
    </RelativeLayout>
</com.google.android.material.card.MaterialCardView>
```

Dimens.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <dimen name="default_card_image_height">150dp</dimen>
    <dimen name="default_card_content_margin">10dp</dimen>
    <dimen name="card_margin">25dp</dimen>
    <dimen name="logo_dim">200dp</dimen>
</resources>
```

Strings.xml

```xml
<resources>
    <string name="app_name">Practical12</string>
    <string name="default_todo_added_at">YYYY-MM-DD HH:MM:SS</string>
    <string name="default_todo_content">Todo</string>
    <string name="default_todo_action">Mark as Done</string>
    <string name="default_todo_delete">Delete</string>
</resources>
```

MainActivity.java

```java
package com.example.practical12;

import android.app.AlertDialog;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import androidx.recyclerview.widget.LinearLayoutManager;
import androidx.recyclerview.widget.RecyclerView;
import androidx.swiperefreshlayout.widget.SwipeRefreshLayout;

import
com.google.android.material.floatingactionbutton.FloatingActionButton;

public class MainActivity extends AppCompatActivity implements
SwipeRefreshLayout.OnRefreshListener {
private TodoRepository todoRepository;
private RecyclerView rvTodos;
private RVAdapter todosAdapter;
private SwipeRefreshLayout swipeLayout;
@Override
protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        todoRepository = new TodoRepository(this);
        todosAdapter = new RVAdapter(this, todoRepository);
        swipeLayout = (SwipeRefreshLayout) findViewById(R.id.swipeLayout);
        swipeLayout.setOnRefreshListener(this);
        rvTodos = (RecyclerView) findViewById(R.id.rvTodos);
        rvTodos.setAdapter(todosAdapter);
        rvTodos.setLayoutManager(new LinearLayoutManager(this));
        FloatingActionButton fabAdd = (FloatingActionButton)
findViewById(R.id
```

```java
        .fabAdd);
        fabAdd.setOnClickListener(v -> {View layout =
getLayoutInflater().inflate(R.layout.dialog_layout,
        null);
        EditText etNewContent = (EditText)
layout.findViewById(R.id.etNewContent);
        AlertDialog dialog = new AlertDialog.Builder(this)
        .setView(layout)
        .setTitle("Add New Todo")
        .setPositiveButton("Save", (_dialog, which) -> {
        String content = etNewContent.getText().toString().trim();
        if (content.length() == 0) {
        Toast.makeText(this, "No Text Entered", Toast.LENGTH_SHORT).show();
        } else {
        todoRepository.create(content);
        loadTodos();
        }
        })
        .setNegativeButton("Cancel", (_dialog, which) -> _dialog.dismiss())
        .create();
        dialog.show();
        });
        loadTodos();
        }
@Override
public void onRefresh() {
        loadTodos();
        }
private void loadTodos() {
        swipeLayout.setRefreshing(true);
        todosAdapter.setTodos(todoRepository.getAll());
        swipeLayout.setRefreshing(false);
        }
        }
```

RVAdapter.java

```java
package com.example.practical12;

import android.content.Context;
import android.util.Log;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.recyclerview.widget.RecyclerView;
import com.google.android.material.card.MaterialCardView;
import java.util.ArrayList;

public class RVAdapter extends RecyclerView.Adapter<RVAdapter.ViewHolder> {
    private final Context ctx;
    private final TodoRepository repository;
    private ArrayList<Todo> todos = new ArrayList<>();
    public RVAdapter(Context context, TodoRepository repository) {
        this.ctx = context;
        this.repository = repository;
```

```java
        }
    @NonNull
    @Override
    public ViewHolder onCreateViewHolder(@NonNull ViewGroup parent, int
viewType) {
        View view = LayoutInflater
                .from(parent.getContext())
                .inflate(R.layout.todo_item, parent, false);
        return new ViewHolder(view);
    }
    @Override
    public void onBindViewHolder(@NonNull ViewHolder holder, int position)
{
        holder.cvParent.setOnClickListener(v ->
                Log.d("DEBUG", todos.get(position).getId() + " Clicked")
        );
        holder.tvTodoContent.setText(todos.get(position).getContent());

holder.tvTodoAddedAt.setText(todos.get(position).getAddedAt().toString
                ());
        if (todos.get(position).isDone()) {
            holder.btnTodoAction.setText("Mark as Not Done");
        } else {
            holder.btnTodoAction.setText("Mark as Done");
        }
        holder.btnTodoAction.setOnClickListener(v -> {
            repository.update(todos.get(position).getId());
            Toast.makeText(ctx, "Todo State Toggled",
Toast.LENGTH_SHORT).show
                    ();
        });
        holder.btnTodoDelete.setOnClickListener(v -> {
            repository.delete(todos.get(position).getId());
            Toast.makeText(ctx, "Todo Deleted", Toast.LENGTH_SHORT).show();
        });
    }
    @Override
    public int getItemCount() {
        return todos.size();
    }
    public void setTodos(ArrayList<Todo> todos) {
        this.todos = todos;
        notifyDataSetChanged();
    }
    public static class ViewHolder extends RecyclerView.ViewHolder {
        private final TextView tvTodoId;
        private final TextView tvTodoContent;
        private final TextView tvTodoAddedAt;
        private final Button btnTodoAction;
        private final Button btnTodoDelete;
        private final MaterialCardView cvParent;
        public ViewHolder(@NonNull View itemView) {
            super(itemView);
            tvTodoId = itemView.findViewById(R.id.tvTodoId);
            tvTodoContent = itemView.findViewById(R.id.tvTodoContent);
            tvTodoAddedAt = itemView.findViewById(R.id.tvTodoAddedAt);
            btnTodoAction = itemView.findViewById(R.id.btnTodoAction);
            btnTodoDelete = itemView.findViewById(R.id.btnTodoDelete);
            cvParent = itemView.findViewById(R.id.cvParent);
        }
```

```
        }
}
```

Todo.java

```java
package com.example.practical12;

import java.time.LocalDateTime;
import java.util.Date;

public class Todo {
    private String id;
    private String content;
    private LocalDateTime addedAt;
    private boolean isDone;
    public Todo(String id, String content, LocalDateTime addedAt, boolean
isDone) {
        this.id = id;
        this.content = content;
        this.addedAt = addedAt;
        this.isDone = isDone;
    }
    public String getId() {
        return id;
    }
    public void setId(String id) {
        this.id = id;
    }
    public String getContent() {
        return content;
    }
    public void setContent(String content) {
        this.content = content;
    }
    public LocalDateTime getAddedAt() {
        return addedAt;
    }
    public void setAddedAt(LocalDateTime addedAt) {
        this.addedAt = addedAt;
    }
    public boolean isDone() {
        return isDone;
    }
    public void setDone(boolean done) {
        isDone = done;
    }

    @Override
    public String toString(){return "Todo{" +
            "id='" + id + '\'' +
            ", content='" + content + '\'' +
            ", addedAt=" + addedAt +
            ", isDone=" + isDone +
            '}';
    }
}
```

TodoRepository.java

```java
package com.example.practical12;

import android.annotation.SuppressLint;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.util.Log;
import java.time.LocalDateTime;
import java.util.ArrayList;
import java.util.UUID;

public class TodoRepository {
    private SQLiteDatabase db;
    private DBService dbService;
    public TodoRepository(Context context) {
        this.dbService = DBService.getInstance(context, "todos", 1);
        this.db = this.dbService.getWritableDatabase();
    }
    @SuppressLint("NewApi")
    public boolean create(String content) {
        try {
            ContentValues contentValues = new ContentValues();
            contentValues.put("Id", UUID.randomUUID().toString());
            contentValues.put("Content", content);
            contentValues.put("AddedAt", LocalDateTime.now().toString());
            contentValues.put("IsDone", false);
            db.insert("todos", null, contentValues);
            return true;
        } catch (Exception e) {
            return false;
        }
    }
    @SuppressLint({"Range", "NewApi"})
    public ArrayList<Todo> getAll() {
        ArrayList<Todo> todos = new ArrayList<>();
        Cursor res = db.rawQuery("SELECT * FROM TODOS", null);
        res.moveToFirst();
        while (!res.isAfterLast()) {
            todos.add(
                    new Todo(
                            res.getString(res.getColumnIndex("Id")),
                            res.getString(res.getColumnIndex("Content")),

LocalDateTime.parse(res.getString(res.getColumnIndex("AddedAt"))),
                            res.getInt(res.getColumnIndex("IsDone")) > 0));
            res.moveToNext();
        }
        res.close();
        for (Todo todo: todos) {
            Log.d("TODO", todo.toString());
        }
        return todos;
    }
    public Todo get(String id) {
        Cursor res = db.rawQuery("SELECT * FROM TODOS WHERE Id = " + id,
null);
        @SuppressLint({"Range", "NewApi", "LocalSuppress"}) Todo todo = new
Todo(
```

```java
                res.getString(res.getColumnIndex("Id")),
                res.getString(res.getColumnIndex("Content")),

LocalDateTime.parse(res.getString(res.getColumnIndex("AddedAt"))),
res.getInt(res.getColumnIndex("IsDone")) > 0
        );
        res.close();
        return todo;
    }
    public void update(String id) {
        db.execSQL("UPDATE TODOS SET IsDone = NOT IsDone WHERE Id = '" + id
+
                "'");
    }
    public void delete(String id) {
        db.execSQL("DELETE FROM TODOS WHERE Id = '" + id + "'");
    }
}
```

DBService.java

```java
package com.example.practical12;

import android.content.Context;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
import androidx.annotation.Nullable;
public class DBService extends SQLiteOpenHelper {
    private static DBService instance = null;
    public DBService(@Nullable Context context, @Nullable String name,
@Nullable SQLiteDatabase.CursorFactory factory, int version) {
        super(context, name, factory, version);
    }
    @Override
    public void onCreate(SQLiteDatabase db) {
        db.execSQL(
                "CREATE TABLE TODOS ("
                        + "Id INT,"
                        + "Content VARCHAR(255),"
                        + "AddedAt DATETIME,"
                        + "IsDone BOOL"
                        + ");"
        );
    }
    @Override
    public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion) {
        db.execSQL("DROP TABLE IF EXISTS TODOS;");
        onCreate(db);
    }
    public static DBService getInstance(Context context, String name, int
version) {
        if (instance == null) {
            instance = new DBService(context, name, null, version);
        }
        return instance;
    }
}
```