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Mobile Application Development Lab Journal

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Q1 Create an Android application and understand the Project and file hierarchy.

- Install Android Studio:

  Download and install Android Studio from the official website: Android Studio Download.
- Open Android Studio:

  Launch Android Studio after installation.
- Configure Android Studio:

  Follow the on-screen instructions to complete the initial setup.

  Make sure to install the necessary SDK components when prompted.
- Create a New Project:

  Click on "Start a new Android Studio project" or select "File" > "New" > "New Project."
- Configure Project:

  Choose the type of template you want for your project (e.g., Empty Activity, Basic Activity).

  Set a name for your project.

  Choose the language (Java or Kotlin).

  Select the minimum API level your app will support.
- Configure Activity:

  Set the name for your main activity.

  Choose a layout option (e.g., "Empty Activity" or "Bottom Navigation Activity").
- Finish Configuration:

  Click "Finish" to create your project. Android Studio will then generate the project files and structure for you.
- Explore Project Structure:

  Familiarize yourself with the project structure, which includes folders like app, res (resources), and manifests.
- Edit Layout and Code:

  Open the layout files in the res/layout folder to design your app's user interface.

  Write your code in the main activity file (usually located in the java or kotlin folder).
- Run Your App:

  Connect an Android device to your computer or use an emulator.

  Click the "Run" button (green triangle) in the toolbar to build and run your app.
- Test and Debug:

  Test your app on different devices or emulators to ensure it works as expected.

  Use Android Studio's debugging tools to identify and fix any issues.
- Build and Distribute:

When your app is ready, you can build an APK (Android Package) for distribution.

You can distribute your app through the Google Play Store or other distribution channels.

These steps provide a general overview of creating an Android project using Android Studio. Keep in mind that Android development involves learning the Android framework, UI design principles, and best coding practices.

Project Structure:

1. app:

   The app directory contains the main code and resources for your application.

   Inside app, you'll find subdirectories like src (source code), res (resources), and manifests (AndroidManifest.xml).

2. src:

   The src directory contains the Java or Kotlin source code for your application.

   It typically has a package structure that mirrors your application's package name.

   For example, if your package name is com.example.myapp, the source code might be in src/main/java/com/example/myapp.

3. res:

   The res directory holds various types of resources used by your application.

   drawable: Contains image files (e.g., PNG, JPEG) used as drawable resources.

   layout: XML files defining the structure and layout of your app's user interface.

   mipmap: App launcher icons in different resolutions.

   values: XML files for storing various values, such as strings, colors, and styles.

4. manifests:

   The manifests directory contains the AndroidManifest.xml file.

   The manifest file declares essential information about your app, such as the app's name, package name, activities, permissions, and more.

5. Gradle Files:

   build.gradle (Project Level):

   The build.gradle file at the project level contains configuration settings for the entire project.

   It may include the Android Gradle Plugin version, repositories, and other project-level settings.

   build.gradle (Module Level - app):

The build.gradle file at the module level (inside the app directory) contains configuration settings specific to the app module.

It includes dependencies, Android SDK version, build types, and other settings.

6. Gradle Wrapper:

   gradle:

   The gradle directory contains files related to the Gradle build system.

   gradle-wrapper.properties and gradlew files are used for the Gradle wrapper, which ensures that the correct version of Gradle is used for building the project.

7. Other Directories:

   libs:

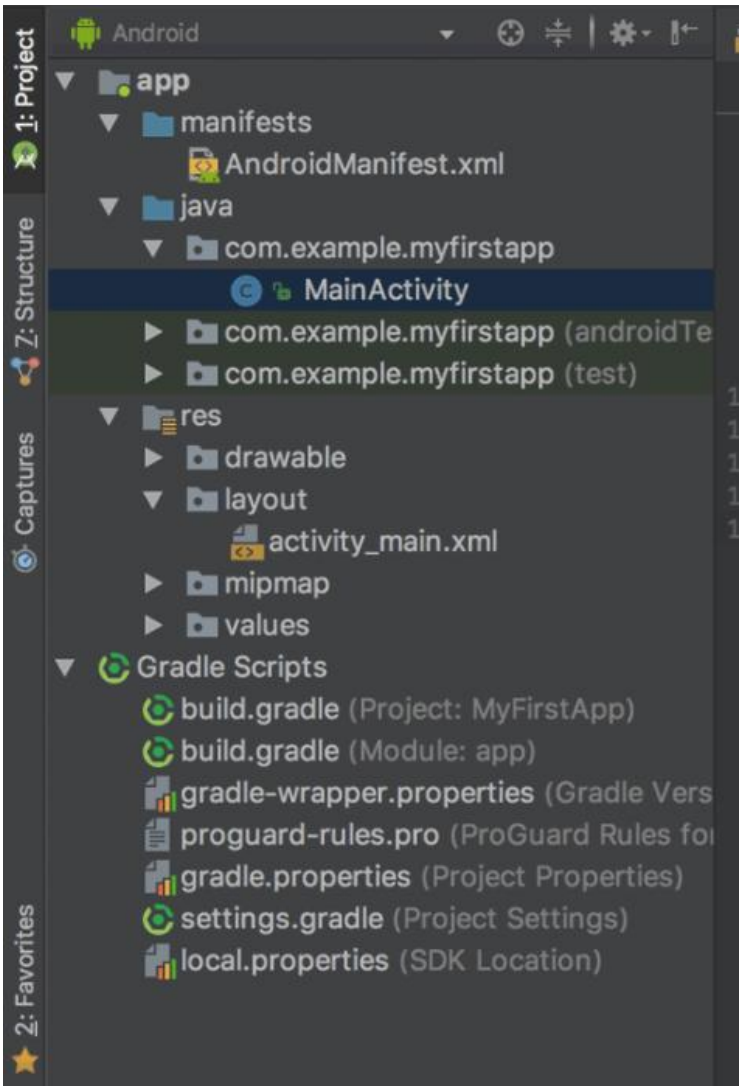
   The libs directory is used for storing external JAR files or libraries that your app may depend on.

   build:

   The build directory is generated by the build process and contains intermediate build files and the final APK.

   .idea:

   The .idea directory contains project-specific settings for IntelliJ IDEA, the underlying IDE for Android Studio.


Android
app
manifests
AndroidManifest.xml
java
com.example.myfirstapp
MainActivity
com.example.myfirstapp (androidTe
com.example.myfirstapp (test)
res
drawable
layout
activity_main.xml
mipmap
values
Gradle Scripts
build.gradle (Project: MyFirstApp)
build.gradle (Module: app)
gradle-wrapper.properties (Gradle Vers
proguard-rules.pro (ProGuard Rules fo
gradle.properties (Project Properties)
settings.gradle (Project Settings)
local.properties (SDK Location)
1: Project
Z: Structure
Captures
2: Favorites

Q2 A. Develop an Android application that uses GUI components, Font and Colors

android_main.xml :

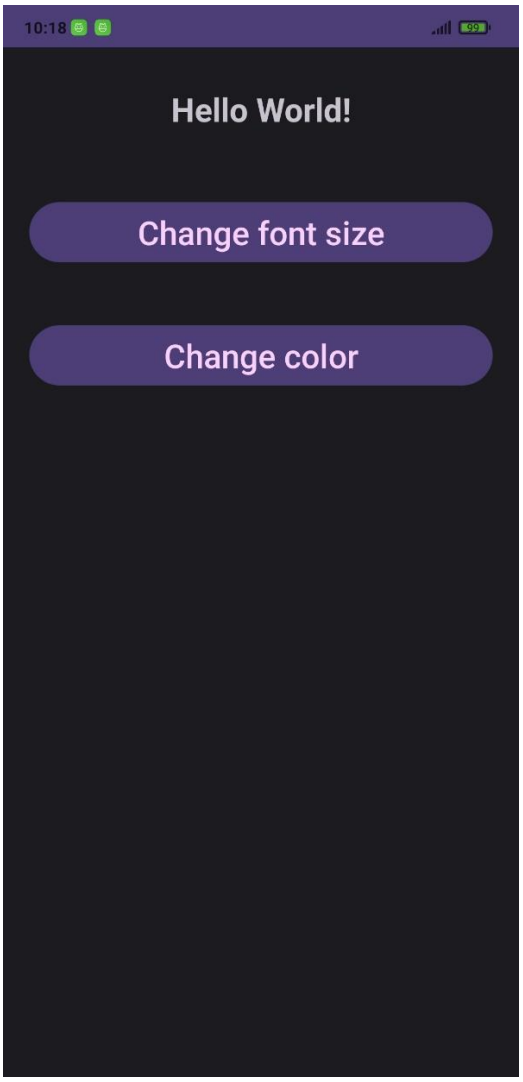
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:orientation="vertical"
   android:layout_width="match_parent"
   android:layout_height="match_parent">

   <TextView
      android:id="@+id/textView"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="30dp"
      android:gravity="center"
      android:text="Hello World!"
      android:textSize="25sp"
      android:textStyle="bold" />

   <Button
      android:id="@+id/button1"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="20dp"
      android:gravity="center"
      android:text="Change font size"
      android:textSize="25sp" />
   <Button
      android:id="@+id/button2"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_margin="20dp"
      android:gravity="center"
      android:text="Change color"
      android:textSize="25sp" />
</LinearLayout>
```

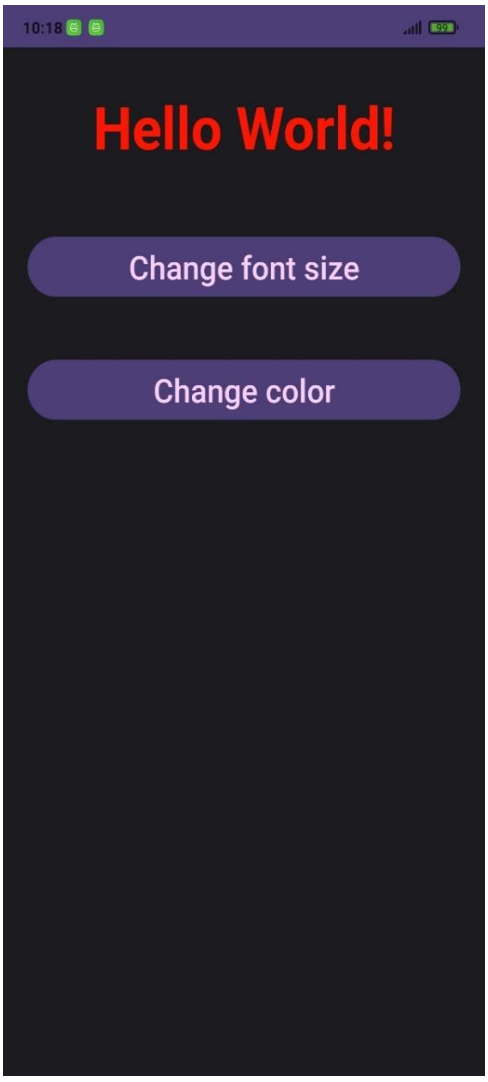
MainActivity.java :

```
package com.example.labfile;

import 7ndroid.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.graphics.Color;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {
   int ch=1;
```

```
    float font=30;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        final TextView t= (TextView) findViewById(R.id.textView);
        Button b1= (Button) findViewById(R.id.button1);
        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                t.setTextSize(font);
                font = font + 5;
                if (font == 50)
                    font = 30;
            }
        });
        Button b2= (Button) findViewById(R.id.button2);
        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                switch (ch) {
                    case 1:
                        t.setTextColor(Color.RED);
                        break;
                    case 2:
                        t.setTextColor(Color.GREEN);
                        break;
                    case 3:
                        t.setTextColor(Color.BLUE);
                        break;
                    case 4:
                        t.setTextColor(Color.CYAN);
                        break;
                    case 5:
                        t.setTextColor(Color.YELLOW);
                        break;
                    case 6:
                        t.setTextColor(Color.MAGENTA);
                        break;
                }
                ch++;
                if (ch == 7)
                    ch = 1;
            }
        });
    }
}
```

Output :


10:18
Hello World!
Change font size
Change color


10:18
Hello World!
Change font size
Change color

Q2 B . Develop an Android application that uses Layout Managers and event listeners. Subscription form and Login form

activity_main.xml :

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

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="100dp">
        <TextView
            android:id="@+id/textView"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_margin="30dp"
            android:text="Details Form"
            android:textSize="25sp"
            android:gravity="center"/>
    </LinearLayout>

    <GridLayout
        android:id="@+id/gridLayout"
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        android:layout_marginTop="100dp"
        android:layout_marginBottom="200dp"
        android:columnCount="2"
        android:rowCount="3">
        <TextView
            android:id="@+id/textView1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="10dp"
            android:layout_row="0"
            android:layout_column="0"
            android:text="Name"
            android:textSize="20sp"
            android:gravity="center"/>

        <EditText
            android:id="@+id/editText"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_margin="10dp"
            android:layout_row="0"
            android:layout_column="1"
            android:ems="10"/>
```

```
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_row="1"
        android:layout_column="0"
        android:text="Reg.No"
        android:textSize="20sp"
        android:gravity="center"/>

    <EditText
        android:id="@+id/editText2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_row="1"
        android:layout_column="1"
        android:inputType="number"
        android:ems="10"/>

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_row="2"
        android:layout_column="0"
        android:text="Dept"
        android:textSize="20sp"
        android:gravity="center"/>

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="10dp"
        android:layout_row="2"
        android:layout_column="1"
        android:spinnerMode="dropdown"/>

</GridLayout>

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_alignParentBottom="true"
    android:layout_centerInParent="true"
    android:layout_marginBottom="150dp"
```

```
        android:text="Submit"/>

    </RelativeLayout>
```

MainActivity.java :

```
    package com.example.labfile;

    import androidx.appcompat.app.AppCompatActivity;
    import android.os.Bundle;
    import android.content.Intent;
    import android.view.View;
    import android.widget.ArrayAdapter;
    import android.widget.Button;
    import android.widget.EditText;
    import android.widget.Spinner;

    public class MainActivity extends AppCompatActivity {
       EditText e1,e2;
       Button bt;
       Spinner s;
       String [] dept_array={"CSE","ECE","IT","Mech","Civil"};
       String name,reg,dept;
       @Override
       protected void onCreate(Bundle savedInstanceState) {
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_main);
          e1= (EditText) findViewById(R.id.editText);
          e2= (EditText) findViewById(R.id.editText2);
          bt= (Button) findViewById(R.id.button);
          s= (Spinner) findViewById(R.id.spinner);

          ArrayAdapter adapter= new
    ArrayAdapter(MainActivity.this,android.R.layout.simple_spinner_item,dept_array);
          s.setAdapter(adapter);

          bt.setOnClickListener(new View.OnClickListener() {
             @Override
             public void onClick(View v) {
                name=e1.getText().toString();
                reg=e2.getText().toString();
                dept=s.getSelectedItem().toString();

                Intent i = new Intent(MainActivity.this,SecondActivity.class);
                i.putExtra("name_key", name);
                i.putExtra("reg_key",reg);
                i.putExtra("dept_key", dept);
```

```
                startActivity(i);

            }
        });
    }
}
```

activity_second.xml :

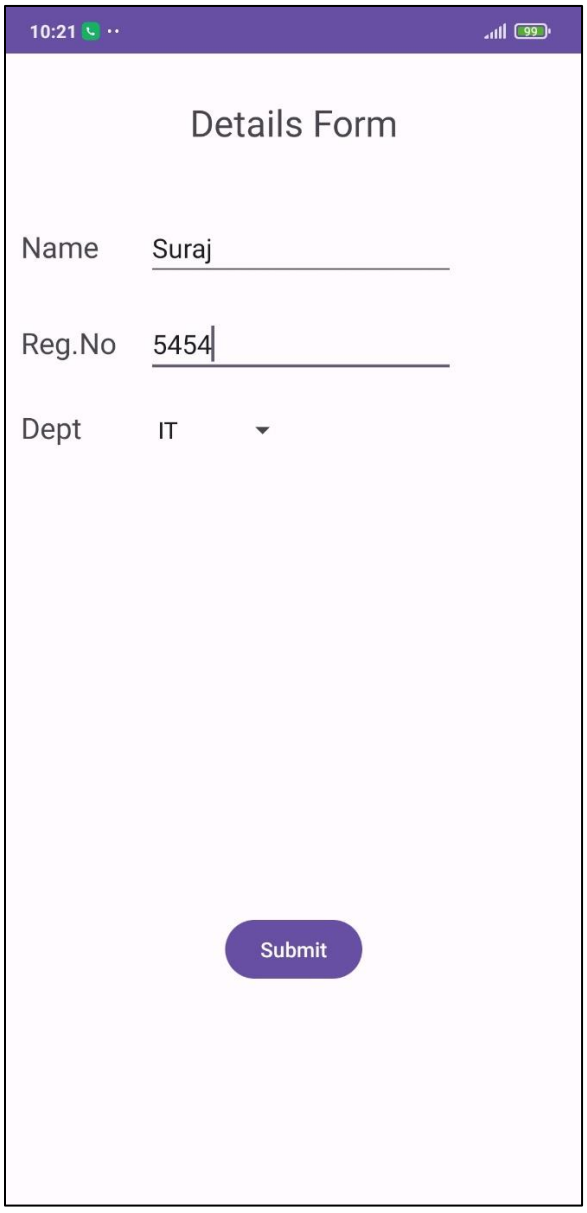
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.example.labfile.SecondActivity"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

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="20dp"
        android:text="New Text"
        android:textSize="30sp"/>

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="20dp"
        android:text="New Text"
        android:textSize="30sp"/>

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_margin="20dp"
        android:text="New Text"
        android:textSize="30sp"/>

</LinearLayout>
```

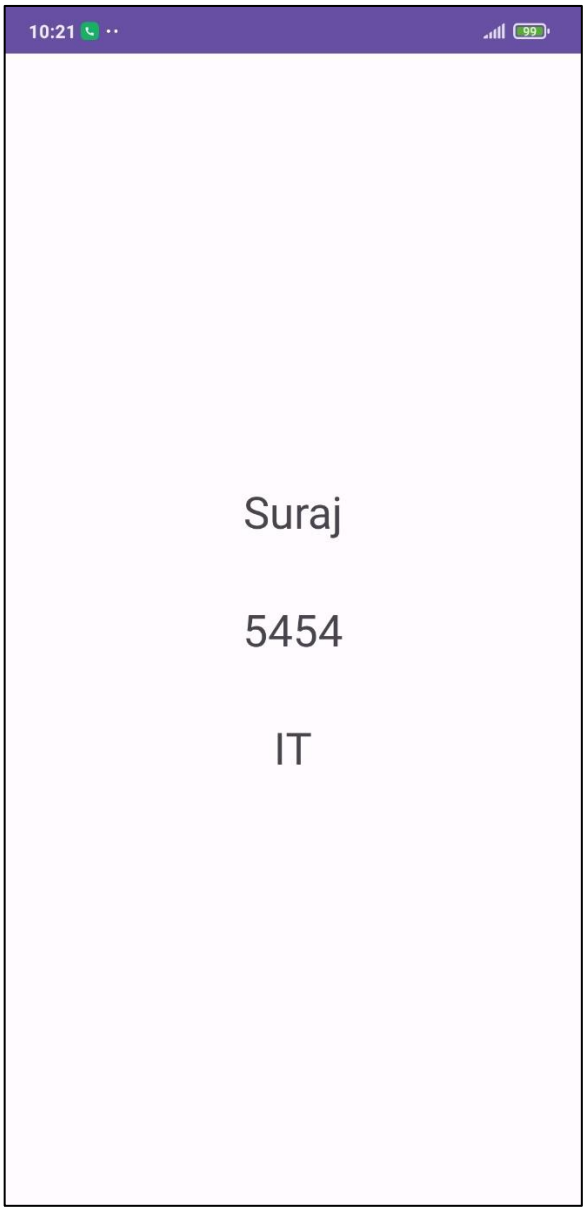
SecondActivity.java :

```
package com.example.labfile;

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

```
import android.os.Bundle;
import android.content.Intent;
import android.widget.TextView;

public class SecondActivity extends AppCompatActivity {
    TextView t1,t2,t3;
    String name,reg,dept;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);

        t1= (TextView) findViewById(R.id.textView1);
        t2= (TextView) findViewById(R.id.textView2);
        t3= (TextView) findViewById(R.id.textView3);

        Intent i = getIntent();
        name=i.getStringExtra("name_key");
        reg=i.getStringExtra("reg_key");
        dept=i.getStringExtra("dept_key");

        t1.setText(name);
        t2.setText(reg);
        t3.setText(dept);
    }
}
```

Output :


10:21
Details Form
Name
Suraj
Reg.No
5454
Dept
IT
Submit


10:21
Suraj
5454
IT

03.Create a fragment that has its own UI and enable your activities to communicate with fragments.

Activity_main.xml

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:orientation="vertical"
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">
<!-- display two Button's and a FrameLayout to replace the Fragment's  -->
<Button
android:id="@+id/firstFragment"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:background="@color/button_background_color"
android:text="First Fragment"
android:textColor="@color/white"
android:textSize="20sp" />

<Button
android:id="@+id/secondFragment"
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_marginTop="10dp"
android:background="@color/button_background_color"
android:text="Second Fragment"
android:textColor="@color/white"
android:textSize="20sp" />

<FrameLayout
android:id="@+id/frameLayout"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:layout_marginTop="10dp" />
</LinearLayout>
```

MainActivity.java

```
package com.abhiandroid.fragmentexample;

import android.app.Fragment;
import android.app.FragmentManager;
import android.app.FragmentTransaction;
import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {

Button firstFragment, secondFragment;

@Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
// get the reference of Button's
firstFragment = (Button) findViewById(R.id.firstFragment);
secondFragment = (Button) findViewById(R.id.secondFragment);

// perform setOnClickListener event on First Button
firstFragment.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
// load First Fragment
loadFragment(new FirstFragment());
}
});
// perform setOnClickListener event on Second Button
secondFragment.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
// load Second Fragment
loadFragment(new SecondFragment());
}
});
}
private void loadFragment(Fragment fragment) {
// create a FragmentManager
FragmentManager fm = getFragmentManager();
// create a FragmentTransaction to begin the transaction and replace the Fragment
FragmentTransaction fragmentTransaction = fm.beginTransaction();
// replace the FrameLayout with new Fragment
fragmentTransaction.replace(R.id.frameLayout, fragment);
fragmentTransaction.commit(); // save the changes
}
}
```

FirstFragment.class

```
package com.abhiandroid.fragmentexample;

import android.app.Fragment;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.Toast;

public class FirstFragment extends Fragment {

View view;
Button firstButton;
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) {
// Inflate the layout for this fragment
view = inflater.inflate(R.layout.fragment_first, container, false);
// get the reference of Button
firstButton = (Button) view.findViewById(R.id.firstButton);
// perform setOnClickListener on first Button
firstButton.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
// display a message by using a Toast
Toast.makeText(getActivity(), "First Fragment", Toast.LENGTH_LONG).show();
}});
return view;
}}
```

SecondFragment.class

```
package com.abhiandroid.fragmentexample;
import android.app.Fragment;
import android.os.Bundle;
import android.view.LayoutInflater;
import android.view.View;
import android.view.ViewGroup;
import android.widget.Button;
import android.widget.Toast;
public class SecondFragment extends Fragment {
View view;
Button secondButton;
@Override
public View onCreateView(LayoutInflater inflater, ViewGroup container,
Bundle savedInstanceState) {
// Inflate the layout for this fragment
```

```
view = inflater.inflate(R.layout.fragment_second, container, false);
// get the reference of Button
secondButton = (Button) view.findViewById(R.id.secondButton);
// perform setOnClickListener on second Button
secondButton.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
// display a message by using a Toast
Toast.makeText(getActivity(), "Second Fragment", Toast.LENGTH_LONG).show();
}});
return view;
}}
```

fragment_first.xml

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context="com.abhiandroid.fragmentexample.FirstFragment">
<!--TextView and Button displayed in First Fragment -->
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_centerHorizontal="true"
android:layout_marginTop="100dp"
android:text="This is First Fragment"
android:textColor="@color/black"
android:textSize="25sp" />
<Button
android:id="@+id/firstButton"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:layout_centerInParent="true"
android:layout_marginLeft="20dp"
android:layout_marginRight="20dp"
android:background="@color/green"
android:text="First Fragment"
android:textColor="@color/white"
android:textSize="20sp"
android:textStyle="bold" />
</RelativeLayout>
```

SecondActivity.xml

```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context="com.abhiandroid.fragmentexample.SecondFragment">
```

```
<!--TextView and Button displayed in Second Fragment -->
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_centerHorizontal="true"
android:layout_marginTop="100dp"
android:text="This is Second Fragment"
android:textColor="@color/black"
android:textSize="25sp" />
<Button
android:id="@+id/secondButton"
android:layout_width="fill_parent"
android:layout_height="wrap_content"
android:layout_centerInParent="true"
android:layout_marginLeft="20dp"
android:layout_marginRight="20dp"
android:background="@color/green"
android:text="Second Fragment"
android:textColor="@color/white"
android:textSize="20sp"
android:textStyle="bold" />
</RelativeLayout>
```

Output :


FragmentExample
FIRST FRAGMENT
SECOND FRAGMENT
This is Second Fragment
SECOND FRAGMENT


FragmentExample
FIRST FRAGMENT
SECOND FRAGMENT
This is First Fragment
FIRST FRAGMENT

Q4. Write an android code to make simple registration page using Intent

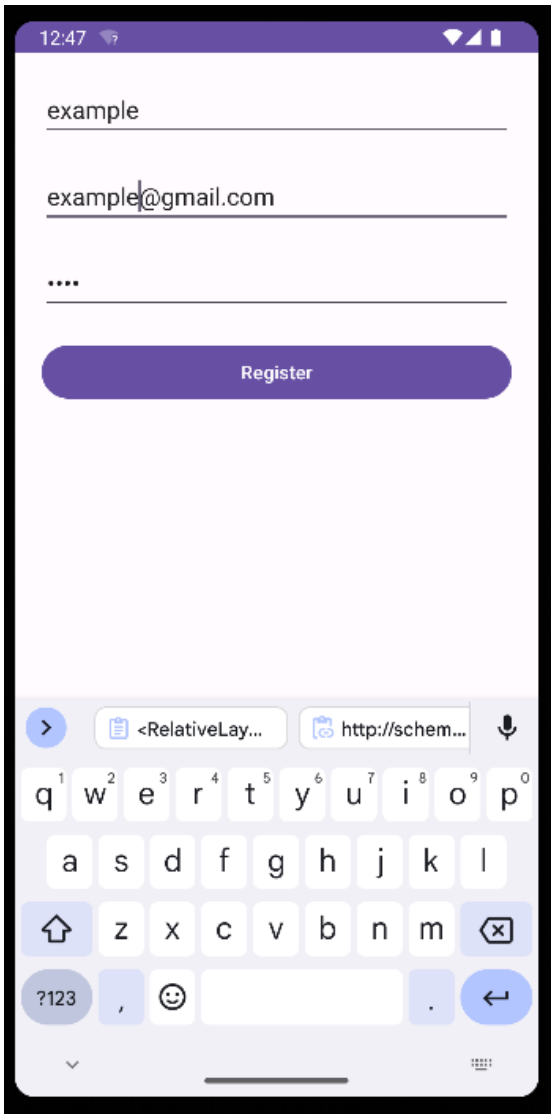
activity_main.xml :

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

   <EditText
      android:id="@+id/editTextUsername"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Username"
      android:layout_marginTop="20dp"
      android:layout_marginHorizontal="20dp"/>

   <EditText
      android:id="@+id/editTextEmail"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Email"
      android:layout_below="@id/editTextUsername"
      android:layout_marginTop="20dp"
      android:layout_marginHorizontal="20dp"/>

   <EditText
      android:id="@+id/editTextPassword"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Password"
      android:inputType="textPassword"
      android:layout_below="@id/editTextEmail"
      android:layout_marginTop="20dp"
      android:layout_marginHorizontal="20dp"/>

   <Button
      android:id="@+id/btnRegister"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:text="Register"
      android:layout_below="@id/editTextPassword"
      android:layout_marginTop="20dp"
      android:layout_marginHorizontal="20dp"/>

</RelativeLayout>
```

MainActivity.java :

```
package com.example.myapplication;// src/main/java/your_package_name/MainActivity.java

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

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

        // Get the views from the layout
        EditText editTextUsername = findViewById(R.id.editTextUsername);
        EditText editTextEmail = findViewById(R.id.editTextEmail);
        EditText editTextPassword = findViewById(R.id.editTextPassword);
        Button btnRegister = findViewById(R.id.btnRegister);

        // Set click listener for the Register button
        btnRegister.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                // Get the entered values
                String username = editTextUsername.getText().toString().trim();
                String email = editTextEmail.getText().toString().trim();
                String password = editTextPassword.getText().toString().trim();

                // Validate and display a toast with registration information
                if (!username.isEmpty() && !email.isEmpty() && !password.isEmpty()) {
                    String registrationInfo = "Username: " + username + "\nEmail: " + email +
"\nPassword: " + password;
                    showToast("Registration successful:\n" + registrationInfo);
                } else {
                    showToast("Please fill in all the fields.");
                }
            }
        });
    }

    private void showToast(String message) {
        Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
    }
}
```

Output :


12:47
example
example@gmail.com
....
Register
<RelativeLay...
http://schem...

Q5 . Write an application to demonstrate Alert Dialog Box in android.

activity_main.xml :

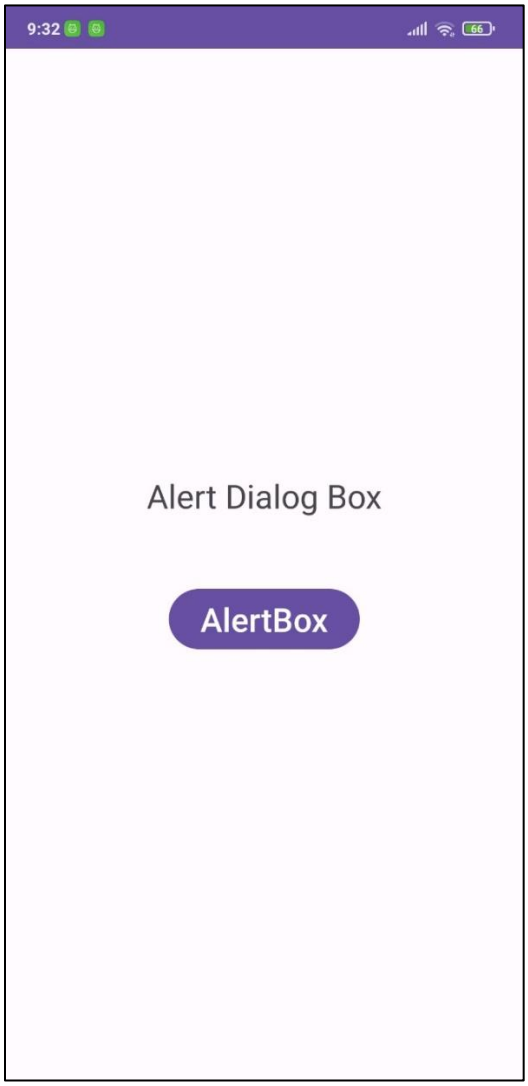
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Alert Dialog Box"
        android:textSize="25dp"
        android:layout_marginBottom="50dp"/>
    <Button
        android:id="@+id/alertBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="AlertBox"
        android:textSize="25dp"/>

</LinearLayout>
```

MainActivity.java :

```
package com.example.alertbox;

import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

public class MainActivity extends AppCompatActivity {
    Button b;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
```

```
        b = (Button) findViewById(R.id.alertBox);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                AlertDialog.Builder builder = new AlertDialog.Builder(MainActivity.this);
                builder.setTitle("Alert !");
                builder.setMessage("Do you want to exit ?");
                builder.setPositiveButton("Yes",null)
                        .setNegativeButton("No",null);
                builder.show();
            }
        });
    }
}
```

Output :



Q6. Demonstrate Array Adapter using List View to display list of fruits.

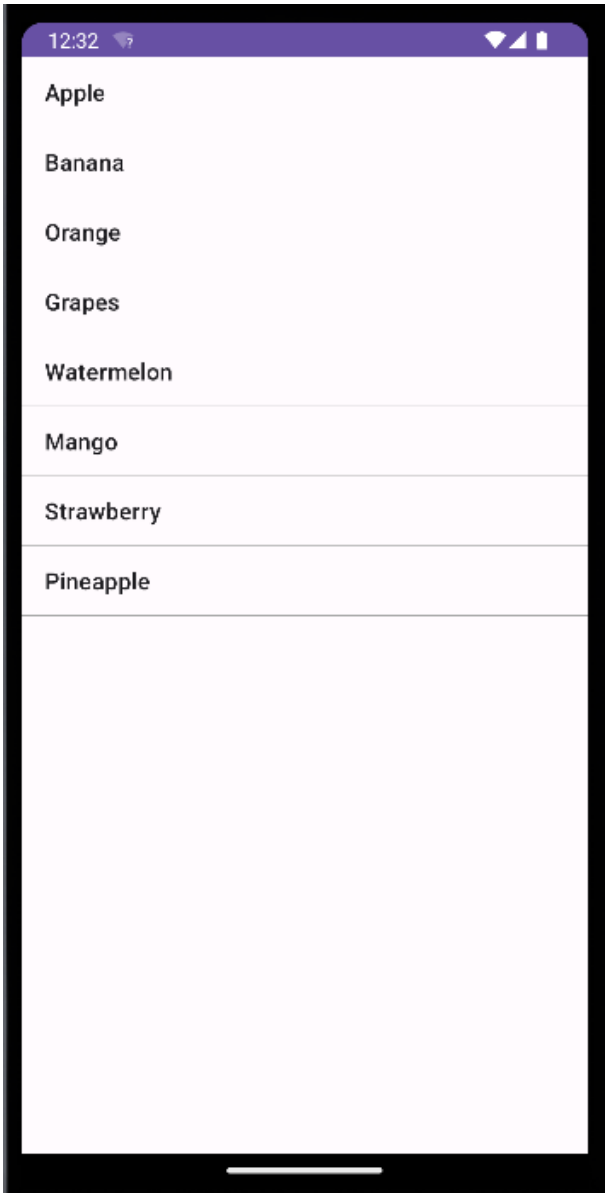
activity_main.xml:

```
<?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">
   <ListView
      android:id="@+id/listViewFruits"
      android:layout_width="match_parent"
      android:layout_height="match_parent"
      android:divider="@android:color/darker_gray"
      android:dividerHeight="0.5dp"/>

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

MainActivity.java :

```
package com.example.myapplication;// src/main/java/your_package_name/MainActivity.java
import android.os.Bundle;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import androidx.appcompat.app.AppCompatActivity;
import java.util.ArrayList;
import java.util.Arrays;

public class MainActivity extends AppCompatActivity {

   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);
      ArrayList<String> fruitsList = new ArrayList<>(Arrays.asList(
            "Apple", "Banana", "Orange", "Grapes", "Watermelon", "Mango", "Strawberry",
"Pineapple"));

      // Create ArrayAdapter
      ArrayAdapter<String> arrayAdapter = new ArrayAdapter<>(
            this,
            android.R.layout.simple_list_item_1,
            fruitsList);
      ListView listViewFruits = findViewById(R.id.listViewFruits);
      listViewFruits.setAdapter(arrayAdapter);
   }
}
```

Output :


12:32
Apple
Banana
Orange
Grapes
Watermelon
Mango
Strawberry
Pineapple

Q7.Write an application to produce Notification

activity_main.xml :

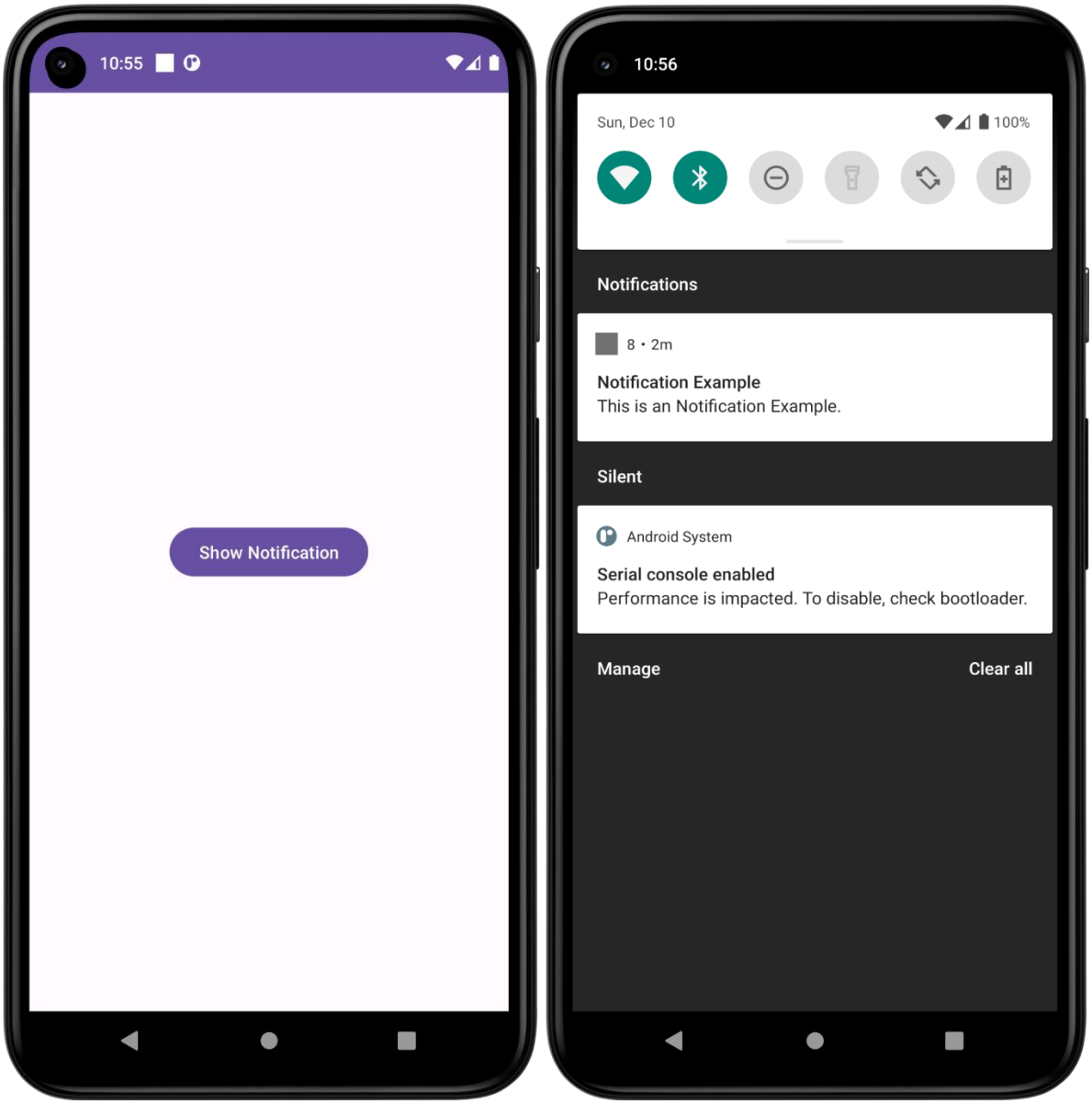
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/showNotificationButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:text="Show Notification" />
</RelativeLayout>
```

MainActivity.java :

```
package com.example.a8;


import android.app.NotificationChannel;
import android.app.NotificationManager;
import android.content.Context;
import android.os.Build;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;

import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.NotificationCompat;
import androidx.core.app.NotificationManagerCompat;

public class MainActivity extends AppCompatActivity {

    private final String channelId = "notification_channel";
    private final int notificationId = 1;

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

        createNotificationChannel();
```

```
        Button showNotificationButton = findViewById(R.id.showNotificationButton);
        showNotificationButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                showNotification();
            }
        });
    }

    private void createNotificationChannel() {
        if (Build.VERSION.SDK_INT >= Build.VERSION_CODES.O) {
            String name = "My Notification Channel";
            String descriptionText = "Channel description";
            int importance = NotificationManager.IMPORTANCE_DEFAULT;
            NotificationChannel channel = new NotificationChannel(channelId, name, importance);
            channel.setDescription(descriptionText);

            NotificationManager notificationManager =
                    (NotificationManager) getSystemService(Context.NOTIFICATION_SERVICE);
            notificationManager.createNotificationChannel(channel);
        }
    }

    private void showNotification() {
        NotificationCompat.Builder builder = new NotificationCompat.Builder(this, channelId)
                .setSmallIcon(R.drawable.ic_notification)
                .setContentTitle("Notification Example")
                .setContentText("This is an Notification Example.")
                .setPriority(NotificationCompat.PRIORITY_DEFAULT);

        NotificationManagerCompat.from(this).notify(notificationId, builder.build());
    }
}
```

Output:-


10:55
Show Notification
10:56
Sun, Dec 10
100%
Notifications
8 • 2m
Notification Example
This is an Notification Example.
Silent
Android System
Serial console enabled
Performance is impacted. To disable, check bootloader.
Manage
Clear all

Q**8. Create an application which demonstrate radio button, check button, and Spinner.**

Activity_main.xml :

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">

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

        <RadioButton
            android:id="@+id/radioButtonOption1"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 1" />

        <RadioButton
            android:id="@+id/radioButtonOption2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Option 2" />
    </RadioGroup>

    <CheckBox
        android:id="@+id/checkBox"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Check me" />

    <Spinner
        android:id="@+id/spinner"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"/>
</LinearLayout>
```

MainActivity.java

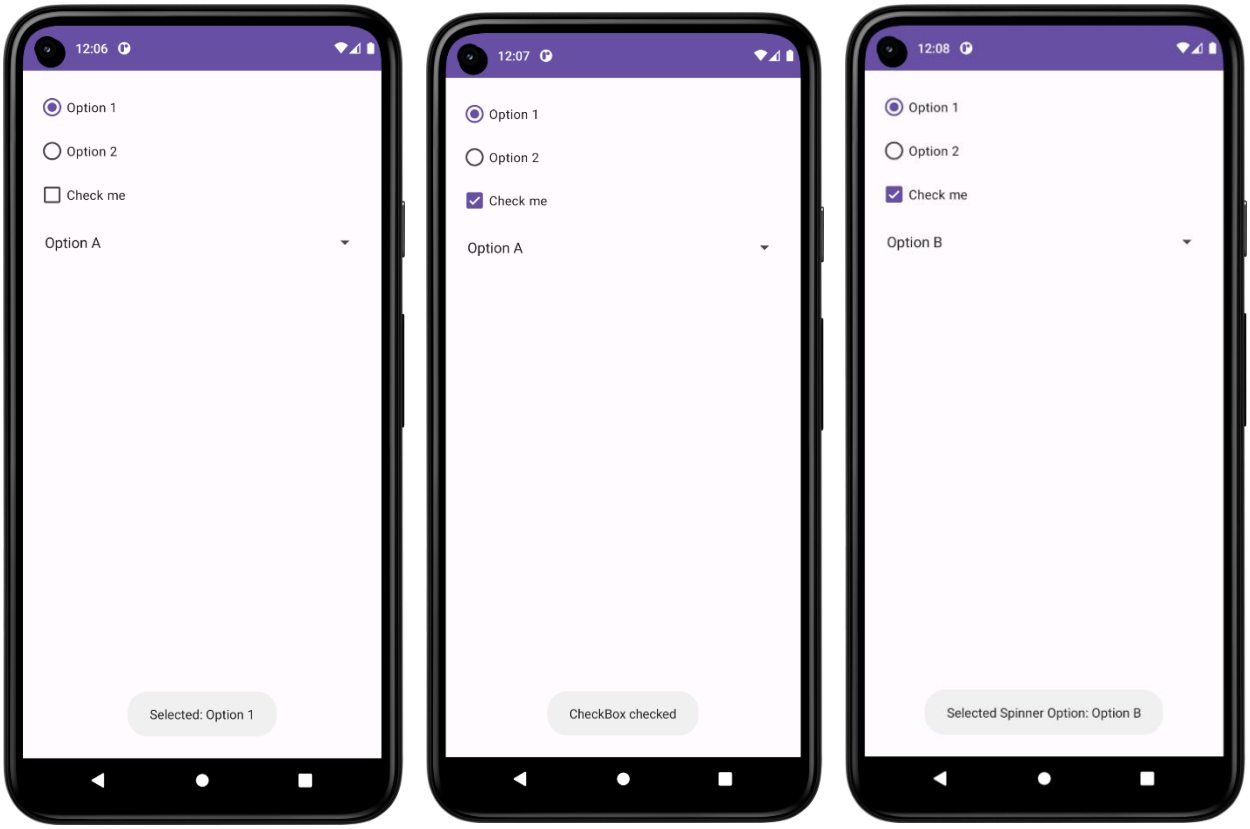
```
package com.example.a9;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.CheckBox;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Spinner;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

        RadioGroup radioGroup = findViewById(R.id.radioGroup);
        CheckBox checkBox = findViewById(R.id.checkBox);
        Spinner spinner = findViewById(R.id.spinner);

        // Set a listener for RadioGroup
        radioGroup.setOnCheckedChangeListener(new RadioGroup.OnCheckedChangeListener() {
            @Override
            public void onCheckedChanged(RadioGroup group, int checkedId) {
                RadioButton radioButton = findViewById(checkedId);
                if (radioButton != null) {
                    showToast("Selected: " + radioButton.getText());
                }
            }
        });

        // Set a listener for CheckBox
        checkBox.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (checkBox.isChecked()) {
                    showToast("CheckBox checked");
                } else {
                    showToast("CheckBox unchecked");
                }
            }
```

```
        });

        // Populate the Spinner with data
        ArrayAdapter<CharSequence> adapter = ArrayAdapter.createFromResource(
                this,
                R.array.spinner_options,
                android.R.layout.simple_spinner_item
        );
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        spinner.setAdapter(adapter);

        // Set a listener for Spinner
        spinner.setOnItemSelectedListener(new AdapterView.OnItemSelectedListener() {
            @Override
            public void onItemSelected(AdapterView<?> parentView, View selectedItemView, int
    position, long id) {
                String selectedOption = (String) parentView.getItemAtPosition(position);
                showToast("Selected Spinner Option: " + selectedOption);
            }

            @Override
            public void onNothingSelected(AdapterView<?> parentView) {
                // Do nothing here
            }
        });
    }

    private void showToast(String message) {
        Toast.makeText(this, message, Toast.LENGTH_LONG).show();
    }
}
```

strings.xml

```
<resources>
    <string-array name="spinner_options">
        <item>Option A</item>
        <item>Option B</item>
        <item>Option C</item>
    </string-array>
</resources>
```

Output:-


12:06
Option 1
Option 2
Check me
Option A
Selected: Option 1
12:07
Option 1
Option 2
Check me
Option A
CheckBox checked
12:08
Option 1
Option 2
Check me
Option B
Selected Spinner Option: Option B

Q9. Design screen to send email (compose email) using linear layout.

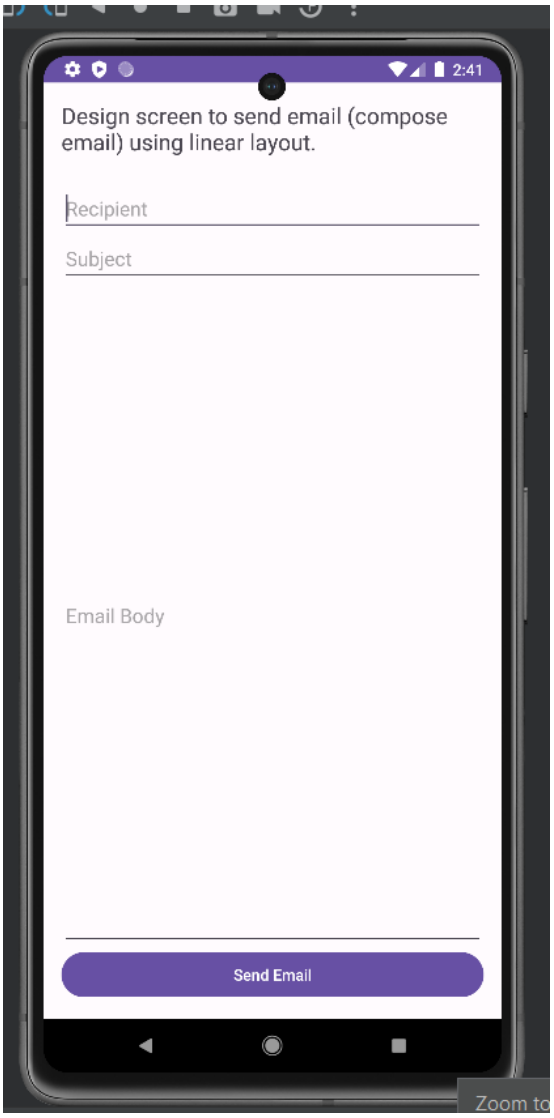
Activity_main.xml

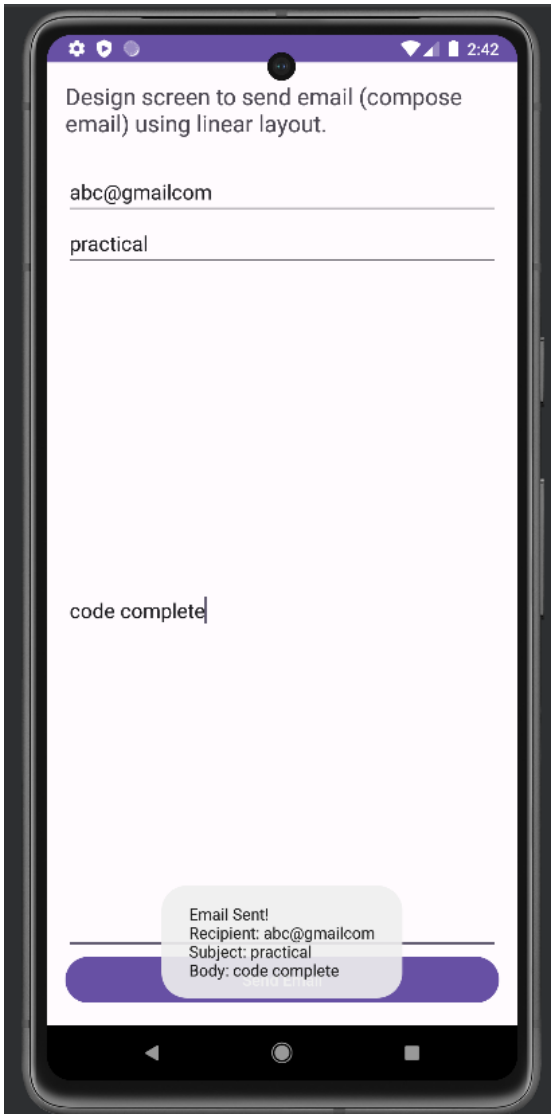
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:textSize="20sp"
        android:text="Design screen to send email (compose email) using linear layout.\n" />

    <EditText
        android:id="@+id/recipientEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Recipient"
        android:inputType="textEmailAddress" />

    <EditText
        android:id="@+id/subjectEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Subject" />

    <MultiAutoCompleteTextView
        android:id="@+id/bodyEditText"
        android:layout_width="match_parent"
        android:layout_height="0dp"
        android:layout_weight="1"
        android:hint="Email Body"
        android:inputType="textMultiLine" />

    <Button
        android:id="@+id/sendButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Send Email" />

</LinearLayout>
```

MainActivity.java

```
package com.example.composeemail;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.MultiAutoCompleteTextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText recipientEditText, subjectEditText;
    private MultiAutoCompleteTextView bodyEditText;

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

        recipientEditText = findViewById(R.id.recipientEditText);
        subjectEditText = findViewById(R.id.subjectEditText);
        bodyEditText = findViewById(R.id.bodyEditText);

        Button sendButton = findViewById(R.id.sendButton);
        sendButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                sendEmail();
            }
        });
    }

    private void sendEmail() {
        String recipient = recipientEditText.getText().toString();
        String subject = subjectEditText.getText().toString();
        String body = bodyEditText.getText().toString();

        // You can implement the email sending logic here

        String message = "Email Sent!\nRecipient: " + recipient + "\nSubject: " + subject + "\nBody:
" + body;
        Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
    }
}
```

Output :


2:41
Design screen to send email (compose email) using linear layout.
Recipient
Subject
Email Body
Send Email


2:42
Design screen to send email (compose email) using linear layout.
abc@gmailcom
practical
code complete
Email Sent!
Recipient: abc@gmailcom
Subject: practical
Body: code complete

Q**10. Create application to demonstrate date and time picker.**

Activity_main.xml

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

<!-- Button to show Date Picker Dialog -->
<Button
   android:id="@+id/btnShowDatePicker"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Show Date Picker"
   android:layout_centerHorizontal="true"
   android:layout_marginTop="50dp"/>

<!-- Button to show Time Picker Dialog -->
<Button
   android:id="@+id/btnShowTimePicker"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:text="Show Time Picker"
   android:layout_below="@id/btnShowDatePicker"
   android:layout_centerHorizontal="true"
   android:layout_marginTop="20dp"/>

</RelativeLayout>
```

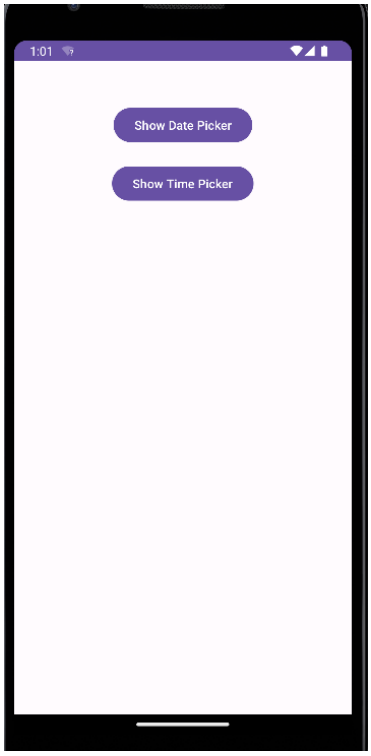
MainActivity.java :

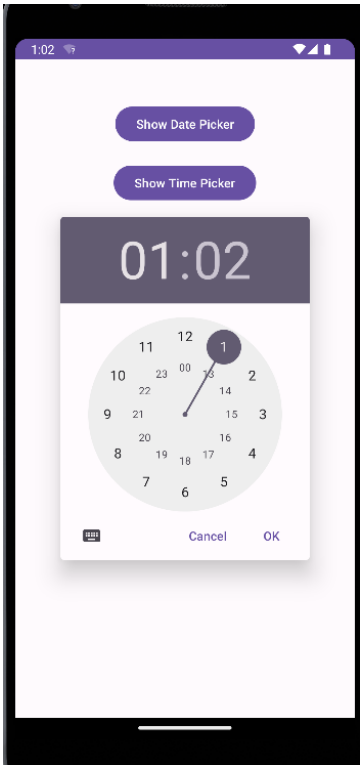
```
package com.example.myapplication;// src/main/java/your_package_name/MainActivity.java

import android.app.DatePickerDialog;
import android.app.TimePickerDialog;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.DatePicker;
import android.widget.TimePicker;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import java.util.Calendar;
public class MainActivity extends AppCompatActivity {
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      setContentView(R.layout.activity_main);

      Button btnShowDatePicker = findViewById(R.id.btnShowDatePicker);
```

```
        Button btnShowTimePicker = findViewById(R.id.btnShowTimePicker);

        btnShowDatePicker.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                showDatePickerDialog();
            }
        });
        btnShowTimePicker.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                showTimePickerDialog();
            }
        });
    }
    private void showDatePickerDialog() {
        // Get the current date
        Calendar calendar = Calendar.getInstance();
        int year = calendar.get(Calendar.YEAR);
        int month = calendar.get(Calendar.MONTH);
        int day = calendar.get(Calendar.DAY_OF_MONTH);

        // Create a Date Picker Dialog
        DatePickerDialog datePickerDialog = new DatePickerDialog(
                this,
                new DatePickerDialog.OnDateSetListener() {
                    @Override
                    public void onDateSet(DatePicker datePicker, int selectedYear, int selectedMonth,
int selectedDay) {
                        String date = selectedYear + "-" + (selectedMonth + 1) + "-" + selectedDay;
                        showToast("Selected Date: " + date);
                    }
                },
                year, month, day);

        // Show the Date Picker Dialog
        datePickerDialog.show();
    }
    private void showTimePickerDialog() {
        Calendar calendar = Calendar.getInstance();
        int hour = calendar.get(Calendar.HOUR_OF_DAY);
        int minute = calendar.get(Calendar.MINUTE);

        // Create a Time Picker Dialog
        TimePickerDialog timePickerDialog = new TimePickerDialog(
                this,
                new TimePickerDialog.OnTimeSetListener() {
                    @Override
                    public void onTimeSet(TimePicker timePicker, int selectedHour, int selectedMinute)
{
                        String time = selectedHour + ":" + selectedMinute;
```

```
                showToast("Selected Time: " + time);
            }
        },
        hour, minute, true); // true for 24-hour format

    // Show the Time Picker Dialog
    timePickerDialog.show();
}

private void showToast(String message) {
    Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
}
}
```

Output :





Q11 . Design screen for payment board and display message on button click.

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="443dp"
      android:layout_height="247dp"
      android:layout_marginTop="2dp"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:srcCompat="@drawable/paypal" />

   <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Card Number :"
      android:textSize="20sp"
      android:textStyle="bold"
      app:layout_constraintBottom_toBottomOf="parent"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintHorizontal_bias="0.175"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent"
      app:layout_constraintVertical_bias="0.414"
      tools:ignore="TouchTargetSizeCheck" />

   <EditText
      android:id="@+id/editText"
      android:layout_width="300dp"
      android:layout_height="40dp"
      android:layout_marginStart="49dp"
      android:layout_marginTop="14dp"
      android:layout_marginEnd="62dp"
```

```
    android:hint="Enter card number"
    android:inputType="number"
    android:textSize="18sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView"
    tools:ignore="TouchTargetSizeCheck" />

<TextView
    android:id="@+id/textView2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="24dp"
    android:layout_marginEnd="250dp"
    android:text="Expiry Date :"
    android:textSize="20sp"
    android:textStyle="bold"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="1.0"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/editText" />

<EditText
    android:id="@+id/editText2"
    android:layout_width="170dp"
    android:layout_height="39dp"
    android:layout_marginStart="17dp"
    android:layout_marginTop="24dp"
    android:layout_marginEnd="62dp"
    android:hint="Enter expiry date"
    android:textSize="18sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toEndOf="@+id/textView2"
    app:layout_constraintTop_toBottomOf="@+id/editText"
    tools:ignore="TouchTargetSizeCheck" />

<TextView
    android:id="@+id/textView3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginTop="32dp"
    android:text="CVV :"
    android:textSize="20sp"
    android:textStyle="bold"
    app:layout_constraintEnd_toEndOf="parent"
```

```
    app:layout_constraintHorizontal_bias="0.135"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView2" />

<EditText
    android:id="@+id/editText3"
    android:layout_width="170dp"
    android:layout_height="39dp"
    android:layout_marginTop="20dp"
    android:hint="Enter CVV"
    android:inputType="number"
    android:textSize="18sp"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.563"
    app:layout_constraintStart_toEndOf="@+id/textView3"
    app:layout_constraintTop_toBottomOf="@+id/editText2"
    tools:ignore="TouchTargetSizeCheck" />

<TextView
    android:id="@+id/textView4"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="49dp"
    android:layout_marginTop="35dp"
    android:layout_marginEnd="67dp"
    android:text="Name :"
    android:textSize="20sp"
    android:textStyle="bold"
    app:layout_constraintEnd_toStartOf="@+id/editText4"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/textView3" />

<EditText
    android:id="@+id/editText4"
    android:layout_width="170dp"
    android:layout_height="40dp"
    android:layout_marginTop="23dp"
    android:layout_marginEnd="62dp"
    android:layout_marginBottom="173dp"
    android:hint="Enter card owner name"
    android:textSize="18sp"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/editText3"
    tools:ignore="TouchTargetSizeCheck" />
```

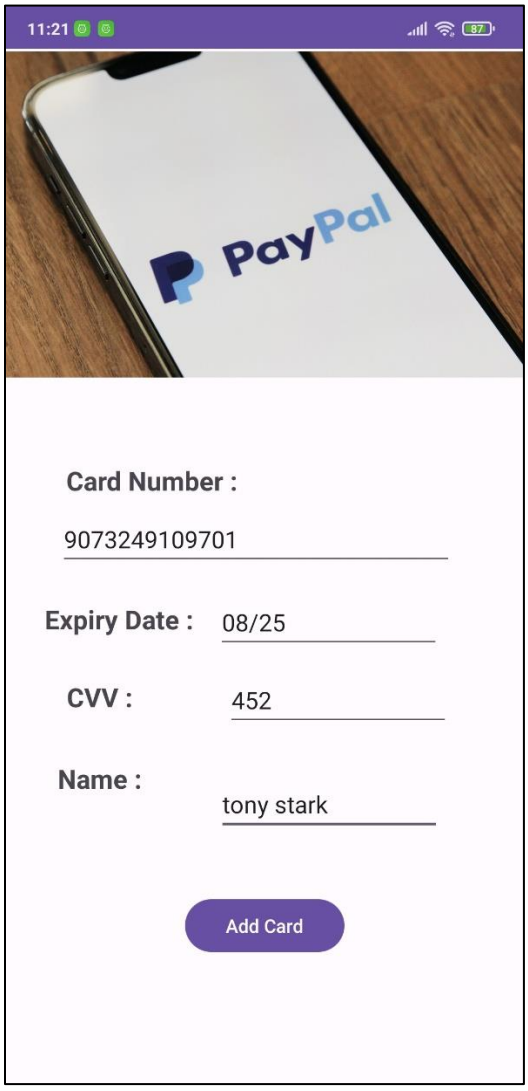
```
    <Button
        android:id="@+id/button"
        android:layout_width="121dp"
        android:layout_height="48dp"
        android:layout_marginBottom="96dp"
        android:text="Add Card"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        tools:ignore="TouchTargetSizeCheck" />

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

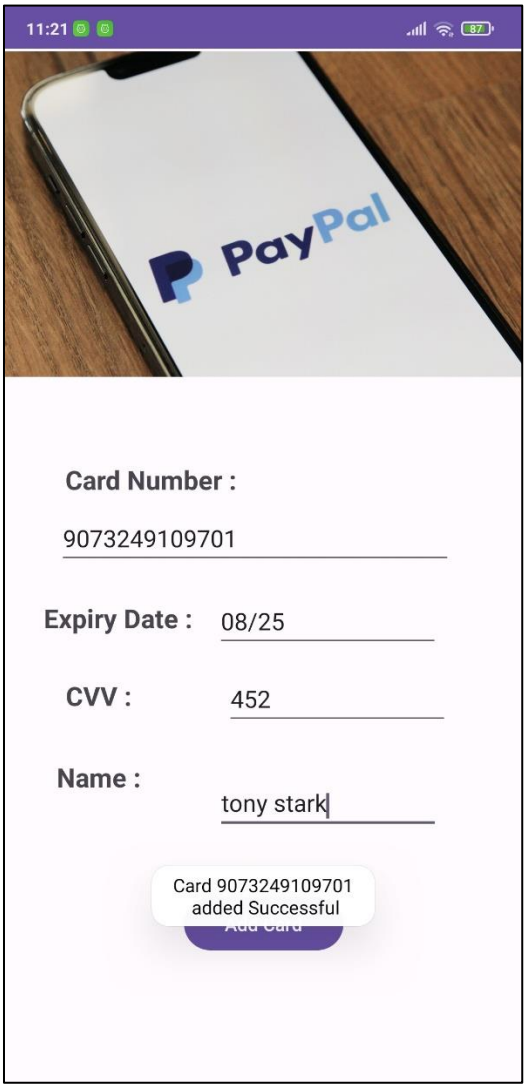
MainActivity.java:

```
package com.example.labq11;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText cNo, oName;
    String cardNo, ownerName;
    Button b;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        cNo = (EditText) findViewById(R.id.editText);
        oName = (EditText) findViewById(R.id.editText4);

        b = (Button) findViewById(R.id.button);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                submit(view);
            }
        });
```

```
    }
    public void submit(View v){
        cardNo = cNo.getText().toString();
        ownerName = oName.getText().toString();
        Toast.makeText(MainActivity.this,"Card "+cardNo +"\n added
Successful",Toast.LENGTH_SHORT).show();
    }

}
```

Output :





Q12. Write a program to demonstrate Options Menu in android for a restaurant and display appropriate message related to the dish user has opted from the menu on text field.

activity_main.xml.

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
   xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:padding="16dp"
   tools:context=".MainActivity">

   <Spinner
      android:id="@+id/menuSpinner"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_alignParentStart="true"
      android:layout_marginBottom="16dp"
      android:entries="@array/menu_options" />

   <Button
      android:id="@+id/displayButton"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@id/menuSpinner"
      android:layout_marginTop="16dp"
      android:text="Display Dish"
      android:onClick="displaySelectedDish" />

   <TextView
      android:id="@+id/resultText"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@id/displayButton"
      android:layout_marginTop="16dp"
      android:text=""
      android:textSize="18sp" />

</RelativeLayout>
```

Array.xml:

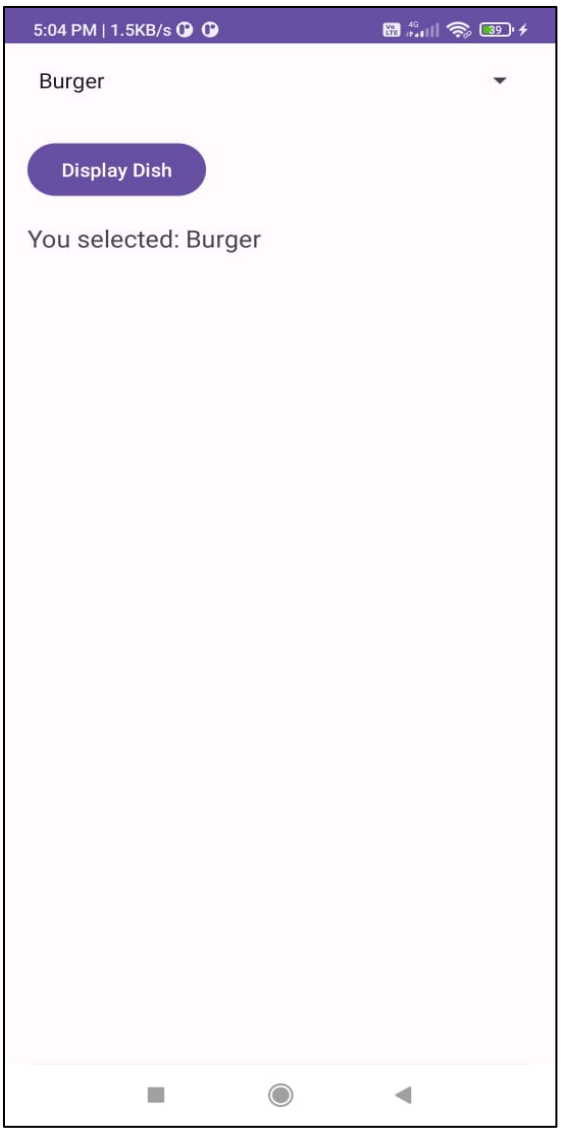
```
<?xml version="1.0" encoding="utf-8"?>
<resources>
   <string-array name="menu_options">
      <item>Pizza</item>
      <item>Burger</item>
      <item>Pasta</item>
      <!-- Add more items as needed -->
   </string-array>

</resources>
```

MainActivity.java:

```
package com.example.a12practical;

import android.os.Bundle;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.Spinner;
import android.widget.TextView;

import androidx.appcompat.app.AppCompatActivity;

import com.example.a12practical.R;

public class MainActivity extends AppCompatActivity {

   private Spinner menuSpinner;
   private TextView resultText;

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

      menuSpinner = findViewById(R.id.menuSpinner);
      resultText = findViewById(R.id.resultText);

      ArrayAdapter<CharSequence> adapter = ArrayAdapter.createFromResource(
            this,
            R.array.menu_options,
            android.R.layout.simple_spinner_item
      );
      adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
      menuSpinner.setAdapter(adapter);
   }
```

```
public void displaySelectedDish(View view) {
    String selectedDish = menuSpinner.getSelectedItem().toString();
    String message = "You selected: " + selectedDish;
    resultText.setText(message);
```

Output-



Q13. Write a program to demonstrate Context Menu in android.

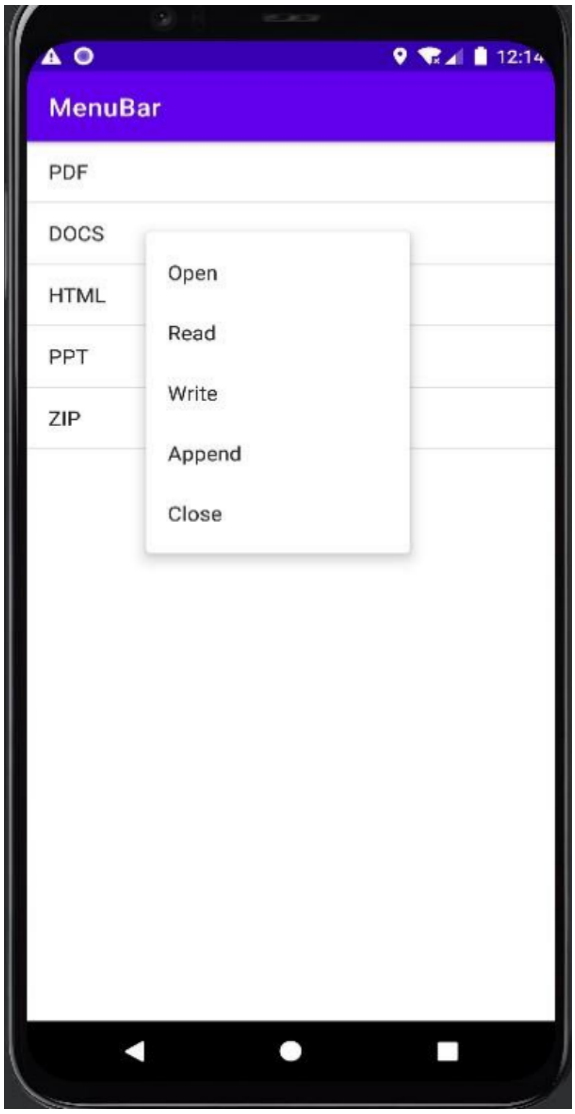
activity_main.xml.

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent" tools:context=".ContextMenuBar">
 <ListView
android:layout_width="match_parent"
android:layout_height="match_parent"
android:id="@+id/fileslist"
 />
</LinearLayout>
```

MainActivity.java:

```
package com.example.menubar; import
androidx.appcompat.app.AppCompatActivity;

import android.os.Bundle;
import android.view.ContextMenu;
import android.view.View;
import android.widget.ArrayAdapter;
import android.widget.ListView;

public class ContextMenuBar extends AppCompatActivity {
 ListView file_list;
 String[] files={"PDF","DOCS","HTML","PPT","ZIP"};
 @Override protected void onCreate(Bundle
savedInstanceState) {
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_context_menu_bar);
file_list=(ListView) findViewById(R.id.fileslist);
ArrayAdapter<String> adapter=new ArrayAdapter<>(this,
android.R.layout.simple_list_item_1,files);
file_list.setAdapter(adapter);
registerForContextMenu(file_list);
 }

 @Override
 public void onCreateContextMenu(ContextMenu menu, View v,
ContextMenu.ContextMenuInfo menuInfo) {
super.onCreateContextMenu(menu, v, menuInfo);
 getMenuInflater().inflate(R.menu.context_menu,menu);
 }
}
```

Output-


12:14
MenuBar
PDF
DOCS
HTML
PPT
ZIP
Open
Read
Write
Append
Close

Q14 . Design android application for login activity. Write android code to check login credentials with username = "mca" and password = "android". Display appropriate toast message to the user.

activity_main.xml :

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

   <TextView
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:text="Login Action"
      android:textSize="40dp"
      android:textStyle="bold"
      android:layout_marginBottom="40dp"
      />

   <LinearLayout
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:orientation="horizontal">

      <TextView
         android:layout_width="wrap_content"
         android:layout_height="wrap_content"
         android:layout_margin="10px"
         android:text="Username : "
         android:textSize="20dp" />

      <EditText
         android:id="@+id/username"
         android:layout_width="200dp"
         android:layout_height="wrap_content"
         android:layout_margin="10px"
         android:hint="Enter Username"
         android:textSize="20dp"
         tools:ignore="TouchTargetSizeCheck" />
   </LinearLayout>
   <LinearLayout
```

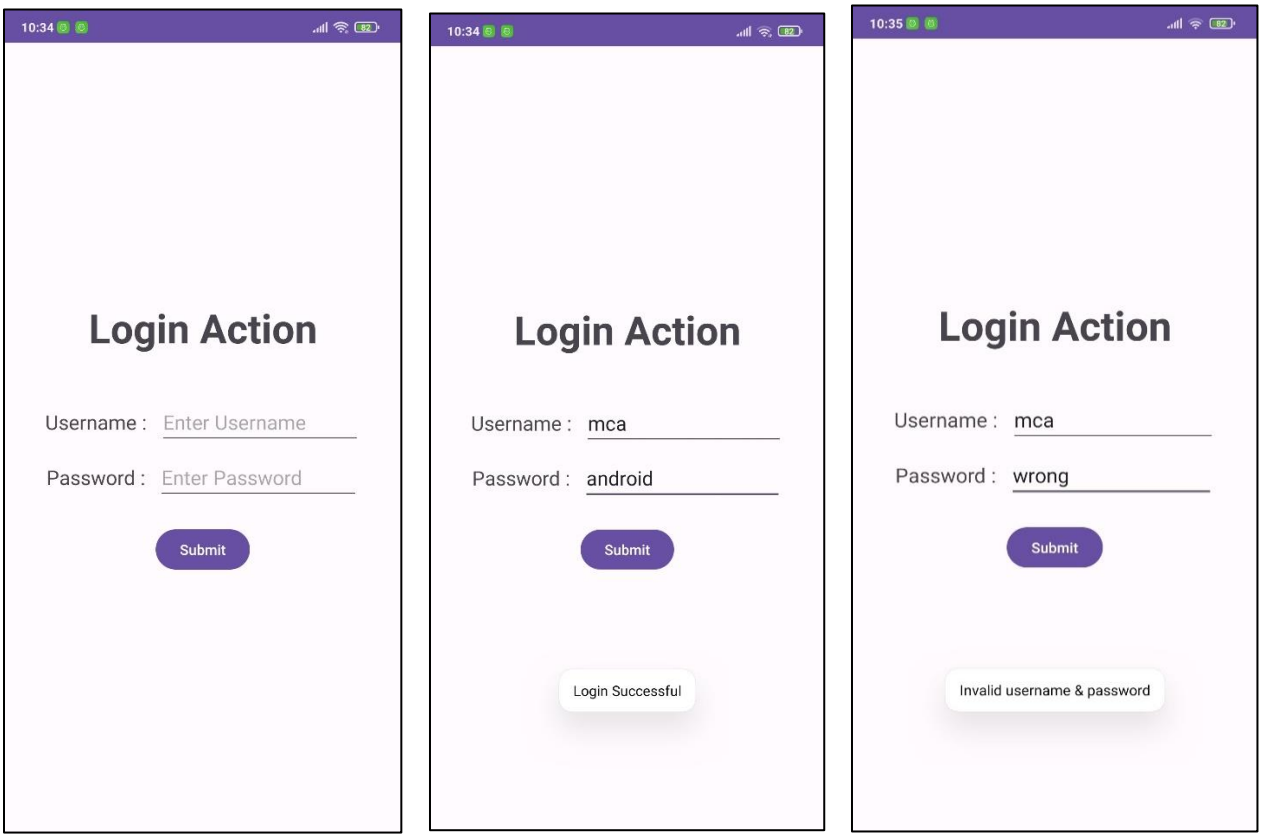
```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="horizontal">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Password : "
            android:textSize="20dp"
            android:layout_margin="10px"/>

        <EditText
            android:id="@+id/password"
            android:layout_width="200dp"
            android:layout_height="wrap_content"
            android:textSize="20dp"
            android:layout_margin="10px"
            android:hint="Enter Password"
            tools:ignore="TouchTargetSizeCheck" />
    </LinearLayout>
    <Button
        android:id="@+id/submit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit"
        android:layout_marginTop="20dp"/>
</LinearLayout>
```

MainActivity.java :

```
package com.example.labq14;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    EditText ed1, ed2;
    Button b;
    String u,p;
```

```
    Context context;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ed1 = (EditText) findViewById(R.id.username);
        ed2 = (EditText) findViewById(R.id.password);

        b = (Button) findViewById(R.id.submit);
        b.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                u = ed1.getText().toString();
                p = ed2.getText().toString();
                if (u.equals("mca") && p.equals("android")){
                    Toast.makeText(MainActivity.this,"Login
Successful",Toast.LENGTH_SHORT).show();
                } else {
                    Toast.makeText(MainActivity.this,"Invalid username &
password",Toast.LENGTH_SHORT).show();
                }
            }
        });
    }}
```

Output :


10:34
Login Action
Username : Enter Username
Password : Enter Password
Submit
10:34
Login Action
Username : mca
Password : android
Submit
Login Successful
10:35
Login Action
Username : mca
Password : wrong
Submit
Invalid username & password

Q15. Write a program to demonstrate Popup Menu in android for cut, copy and paste options in it and display appropriate information related to operation.

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">

    <Button
        android:id="@+id/clickBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:background="#0F9D58"
        android:text="Click Me"
        android:textColor="#ffffff"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

popup_menu.xml

```
<?xml version="1.0" encoding="utf-8"?>
<menu xmlns:android="http://schemas.android.com/apk/res/android">
    <item
        android:id="@+id/java"
```

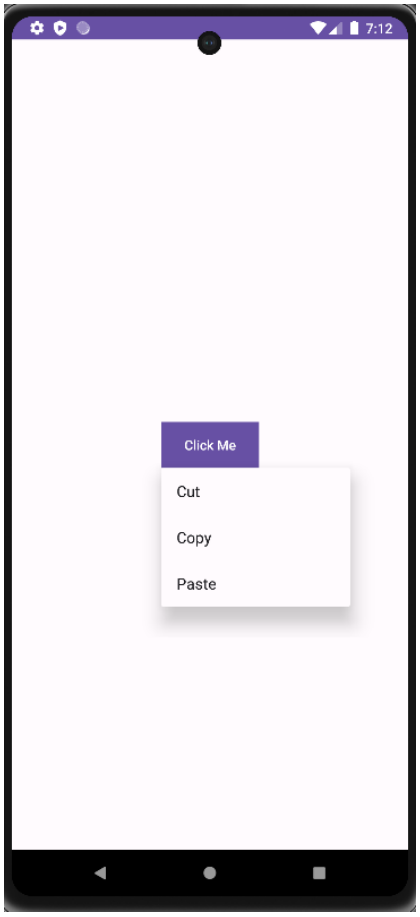
```
            android:title="Java" />
        <item
            android:id="@+id/kotlin"
            android:title="Kotlin" />
        <item
            android:id="@+id/android"
            android:title="Android" />
        <item
            android:id="@+id/react_native"
            android:title="React Native" />
    </menu>
```

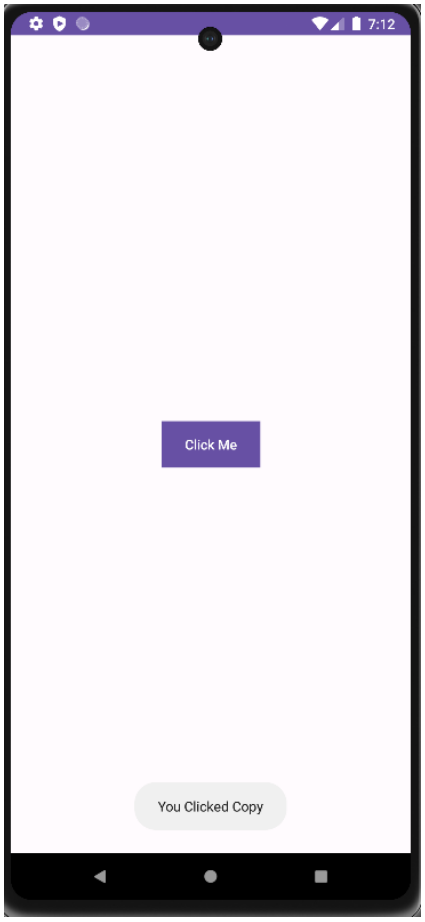
MainActivity.xml

```
    import androidx.appcompat.app.AppCompatActivity;
    import android.os.Bundle;
    import android.view.MenuItem;
    import android.view.View;
    import android.widget.Button;
    import android.widget.PopupMenu;
    import android.widget.Toast;

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

```
        PopupMenu popupMenu = new PopupMenu(MainActivity.this, button);
        popupMenu.getMenuInflater().inflate(R.menu.popup_menu, popupMenu.getMenu());
        popupMenu.setOnMenuItemClickListener(new PopupMenu.OnMenuItemClickListener()
{
                @Override
                public boolean onMenuItemClick(MenuItem menuItem) {
                Toast.makeText(MainActivity.this,"YouClicked"+menuItem.getTitle(),
Toast.LENGTH_SHORT).show();
                                        return true;
                                        }
                                });
                                popupMenu.show();
                        }
                });
        } }
```

Output :





Q16. Write an application to display image button.

activity_main.xml

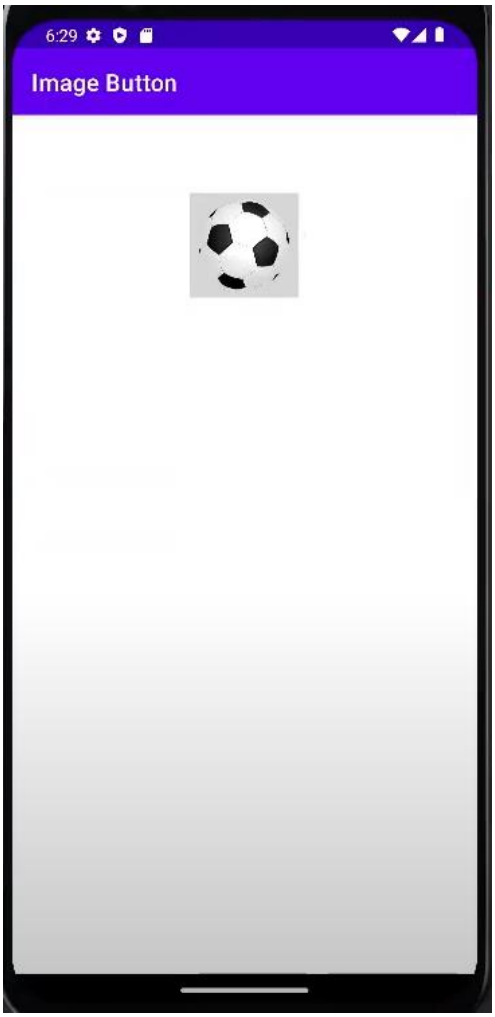
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="16dp"
    android:paddingTop="16dp"
    android:paddingRight="16dp"
    android:paddingBottom="16dp"
    tools:context=".MainActivity">
    <ImageButton
        android:id="@+id/imageButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/ic_launcher_foreground"
        android:layout_centerInParent="true"/>
</RelativeLayout>
```

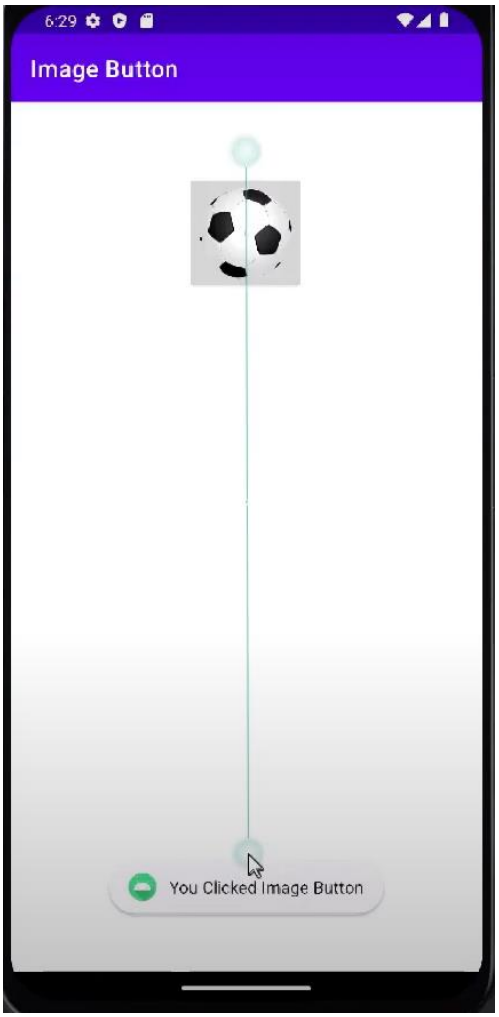
MainActivity.java

```
package com.example.imagebuttonexample;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.ImageButton;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
```

```
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ImageButton imageButton = findViewById(R.id.imageButton);
        imageButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                // Display a toast message when the image button is clicked
                Toast.makeText(getApplicationContext(), "You clicked image button", Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

Output :





Q**17. Demonstrate an application to implement web view in android.**

<!-- AndroidManifest.xml -->

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

<!-- res/layout/activity_main.xml -->

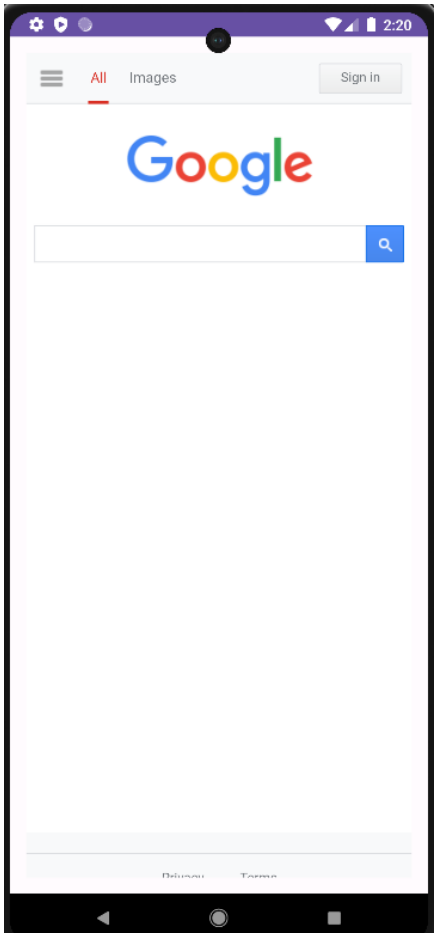
```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:paddingLeft="16dp"
   android:paddingTop="16dp"
   android:paddingRight="16dp"
   android:paddingBottom="16dp"
   tools:context=".MainActivity">

   <WebView
      android:id="@+id/webView"
      android:layout_width="match_parent"
      android:layout_height="match_parent"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.webviewexample;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.webkit.WebSettings;
import android.webkit.WebView;
import android.webkit.WebViewClient;

public class MainActivity extends AppCompatActivity {

   private WebView webView;

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

      webView = findViewById(R.id.webView);

      WebSettings webSettings = webView.getSettings();
      webSettings.setJavaScriptEnabled(true);


      webView.setWebViewClient(new WebViewClient());
```

```
        webView.loadUrl("https://www.google.com/");
    }

    // Override the onBackPressed method to handle navigation within the WebView
    @Override
    public void onBackPressed() {
        if (webView.canGoBack()) {
            webView.goBack();
        } else {
            super.onBackPressed();
        }
    }
}
```

Output :



Q.18.Write an android code to turn ON/OFF Bluetooth

XML : -

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

    <!--Changes the state of Bluetooth on button click-->
    <Button
        android:id="@+id/BtBtn"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:text="Click" />

    <!--Displays the state of Bluetooth on button click-->
    <TextView
        android:id="@+id/BtTv"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_above="@id/BtBtn"
        android:layout_centerHorizontal="true"
        android:hint="Bluetooth Status"
        android:textSize="30sp" />

</RelativeLayout>
```

Java Code

```
import android.bluetooth.BluetoothAdapter;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

   private BluetoothAdapter bluetoothAdapter;

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

      bluetoothAdapter = BluetoothAdapter.getDefaultAdapter();
```

```
        Button toggleButton = findViewById(R.id.toggleButton);
        toggleButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                toggleBluetooth();
            }
        });
    }

    private void toggleBluetooth() {
        if (bluetoothAdapter == null) {
            // Device does not support Bluetooth
            return;
        }

        if (bluetoothAdapter.isEnabled()) {
            // Bluetooth is currently enabled, turn it off
            bluetoothAdapter.disable();
        } else {
            // Bluetooth is currently disabled, turn it on
            Intent enableBluetoothIntent = new
Intent(BluetoothAdapter.ACTION_REQUEST_ENABLE);
            startActivityForResult(enableBluetoothIntent, 1);
        }
    }
}
```

Output :

Q19. Write an android application using SQLite to create table and perform CRUD operations (Example. COURSE table (ID, Name, Duration, Description), perform ADD, UPDATE, DELETE and READ operations)

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="match_parent"
   android:layout_height="match_parent"
   android:padding="16dp">

   <!-- Name -->
   <EditText
      android:id="@+id/editTextName"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:hint="Name"/>

   <!-- Duration -->
   <EditText
      android:id="@+id/editTextDuration"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_below="@+id/editTextName"
      android:layout_marginTop="16dp"
      android:hint="Duration"/>

   <!-- Description -->
   <EditText
      android:id="@+id/editTextDescription"
      android:layout_width="match_parent"
      android:layout_height="wrap_content"
      android:layout_below="@+id/editTextDuration"
      android:layout_marginTop="16dp"
      android:hint="Description"/>

   <!-- Add Button -->
   <Button
      android:id="@+id/buttonAdd"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_below="@+id/editTextDescription"
      android:layout_marginTop="16dp"
      android:text="Add"/>

   <!-- Read Button -->
   <Button
      android:id="@+id/buttonRead"
```

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/buttonAdd"
        android:layout_marginTop="16dp"
        android:text="Read"/>

    <!-- Update Button -->
    <Button
        android:id="@+id/buttonUpdate"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/buttonRead"
        android:layout_marginTop="16dp"
        android:text="Update"/>

    <!-- Delete Button -->
    <Button
        android:id="@+id/buttonDelete"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/buttonUpdate"
        android:layout_marginTop="16dp"
        android:text="Delete"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.a19;

import android.content.ContentValues;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    private EditText etName, etDuration, etDescription;
    private Button btnAdd, btnRead, btnUpdate, btnDelete;
    private DatabaseHelper dbHelper;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);

    etName = findViewById(R.id.editTextName);
    etDuration = findViewById(R.id.editTextDuration);
    etDescription = findViewById(R.id.editTextDescription);

    btnAdd = findViewById(R.id.buttonAdd);
    btnRead = findViewById(R.id.buttonRead);
    btnUpdate = findViewById(R.id.buttonUpdate);
    btnDelete = findViewById(R.id.buttonDelete);

    dbHelper = new DatabaseHelper(this);

    btnAdd.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            addCourse();
        }
    });

    btnRead.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            readCourses();
        }
    });

    btnUpdate.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            updateCourse();
        }
    });

    btnDelete.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            deleteCourse();
        }
    });
}

private void addCourse() {
    SQLiteDatabase db = dbHelper.getWritableDatabase();
    ContentValues values = new ContentValues();

    values.put(DatabaseHelper.COLUMN_NAME, etName.getText().toString());
    values.put(DatabaseHelper.COLUMN_DURATION, etDuration.getText().toString());
    values.put(DatabaseHelper.COLUMN_DESCRIPTION, etDescription.getText().toString());
```

```
        long newRowId = db.insert(DatabaseHelper.TABLE_NAME, null, values);

        showToast(newRowId != -1 ? "Course added successfully!" : "Error adding course.");

        db.close();
    }

    private void readCourses() {
        SQLiteDatabase db = dbHelper.getReadableDatabase();
        String[] projection = {
                DatabaseHelper.COLUMN_ID,
                DatabaseHelper.COLUMN_NAME,
                DatabaseHelper.COLUMN_DURATION,
                DatabaseHelper.COLUMN_DESCRIPTION
        };

        Cursor cursor = db.query(
                DatabaseHelper.TABLE_NAME,
                projection,
                null,
                null,
                null,
                null,
                null
        );

        StringBuilder result = new StringBuilder("Courses:\n");

        while (cursor.moveToNext()) {
            long id =
cursor.getLong(cursor.getColumnIndexOrThrow(DatabaseHelper.COLUMN_ID));
            String name =
cursor.getString(cursor.getColumnIndexOrThrow(DatabaseHelper.COLUMN_NAME));
            String duration =
cursor.getString(cursor.getColumnIndexOrThrow(DatabaseHelper.COLUMN_DURATION));
            String description =
cursor.getString(cursor.getColumnIndexOrThrow(DatabaseHelper.COLUMN_DESCRIPTION));

            result.append("ID: ").append(id).append(", Name: ").append(name)
                    .append(", Duration: ").append(duration).append(", Description:
").append(description).append("\n");
        }

        showToast(result.toString());

        cursor.close();
        db.close();
    }
```

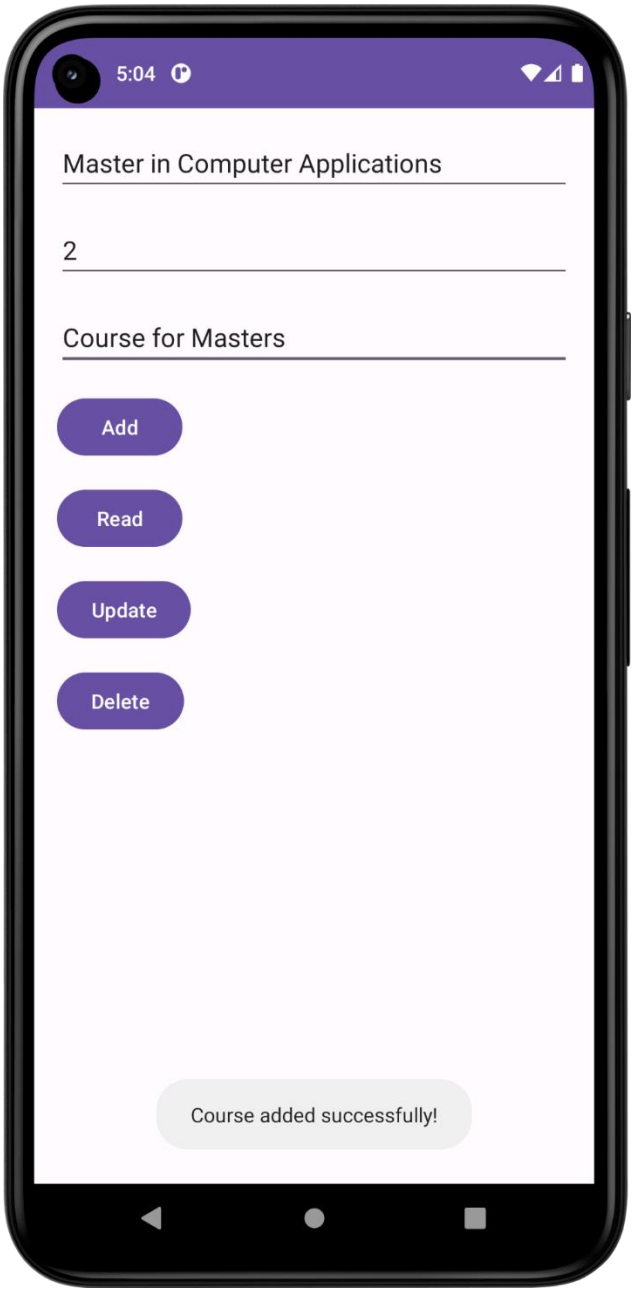
```
    private void updateCourse() {
        SQLiteDatabase db = dbHelper.getWritableDatabase();
        ContentValues values = new ContentValues();

        values.put(DatabaseHelper.COLUMN_NAME, etName.getText().toString());
        values.put(DatabaseHelper.COLUMN_DURATION, etDuration.getText().toString());
        values.put(DatabaseHelper.COLUMN_DESCRIPTION, etDescription.getText().toString());

        String selection = DatabaseHelper.COLUMN_ID + " = ?";
        String[] selectionArgs = {String.valueOf(1)}; // You need to provide the course ID for
update

        int count = db.update(
                DatabaseHelper.TABLE_NAME,
                values,
                selection,
                selectionArgs
        );

        showToast(count > 0 ? "Course updated successfully!" : "Error updating course.");

        db.close();
    }

    private void deleteCourse() {
        SQLiteDatabase db = dbHelper.getWritableDatabase();
        String selection = DatabaseHelper.COLUMN_ID + " = ?";
        String[] selectionArgs = {String.valueOf(1)}; // You need to provide the course ID for delete

        int count = db.delete(
                DatabaseHelper.TABLE_NAME,
                selection,
                selectionArgs
        );

        showToast(count > 0 ? "Course deleted successfully!" : "Error deleting course.");

        db.close();
    }

    private void showToast(String message) {
        Toast.makeText(this, message, Toast.LENGTH_SHORT).show();
    }
}
```

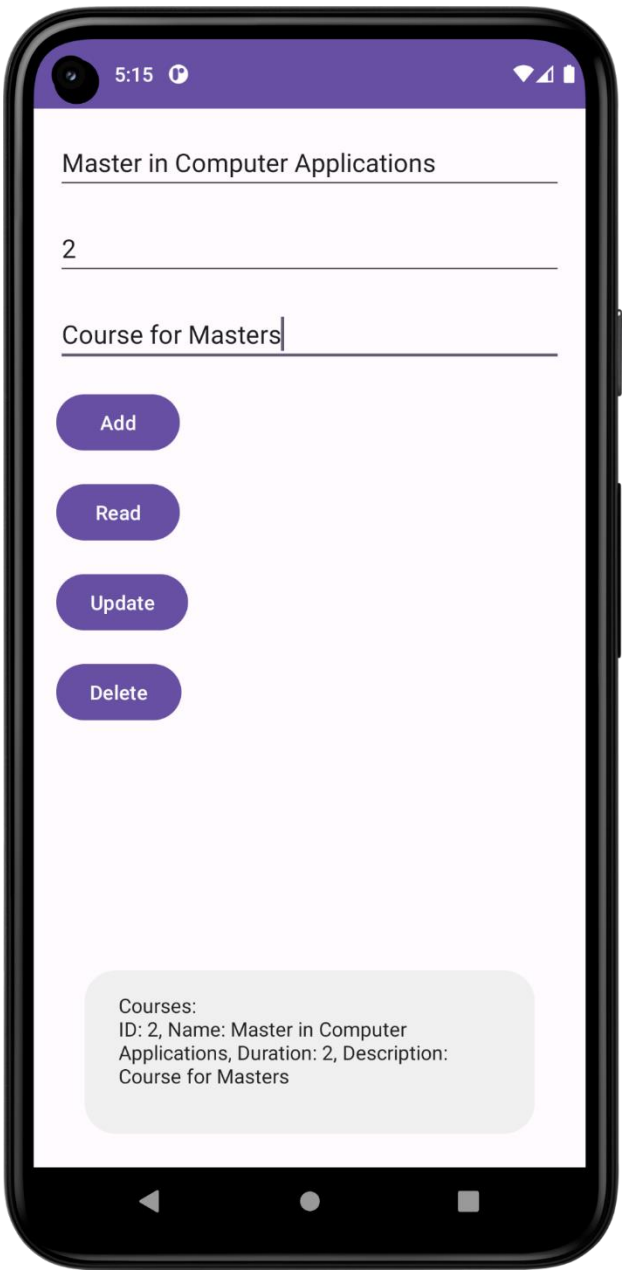
DatabaseHelper.java

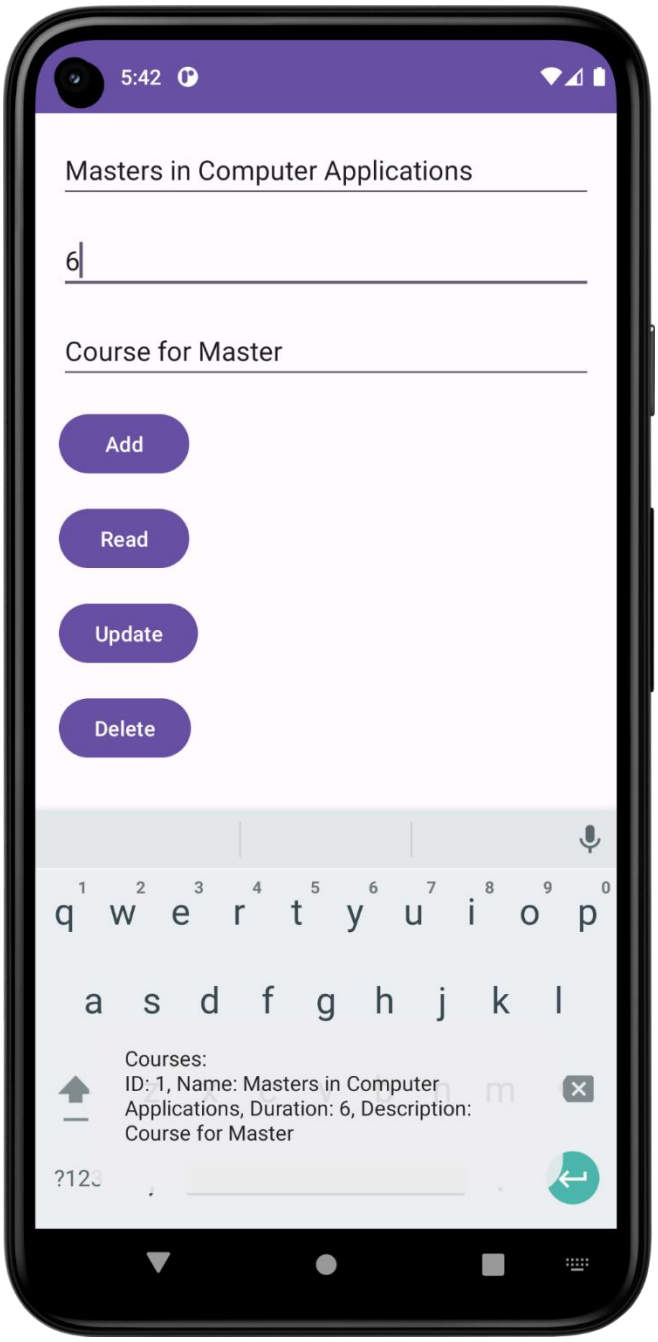
```
package com.example.a19;
import android.content.Context;
```

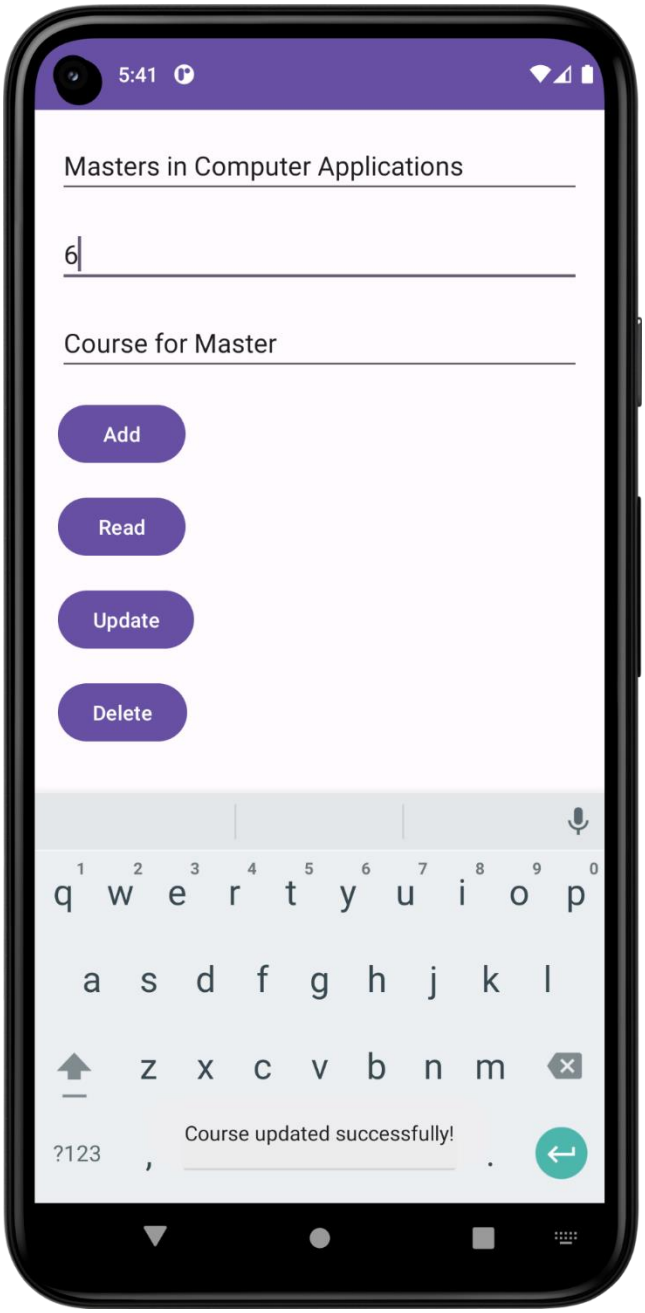
```
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;

public class DatabaseHelper extends SQLiteOpenHelper {

   private static final String DATABASE_NAME = "courses.db";
   private static final int DATABASE_VERSION = 1;

   public static final String TABLE_NAME = "COURSE";
   public static final String COLUMN_ID = "ID";
   public static final String COLUMN_NAME = "Name";
   public static final String COLUMN_DURATION = "Duration";
   public static final String COLUMN_DESCRIPTION = "Description";

   private static final String SQL_CREATE_TABLE =
         "CREATE TABLE " + TABLE_NAME + " (" +
               COLUMN_ID + " INTEGER PRIMARY KEY AUTOINCREMENT," +
               COLUMN_NAME + " TEXT," +
               COLUMN_DURATION + " TEXT," +
               COLUMN_DESCRIPTION + " TEXT)";

   private static final String SQL_DELETE_TABLE =
         "DROP TABLE IF EXISTS " + TABLE_NAME;

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

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

   @Override
   public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion) {
      db.execSQL(SQL_DELETE_TABLE);
      onCreate(db);
   }
}
```

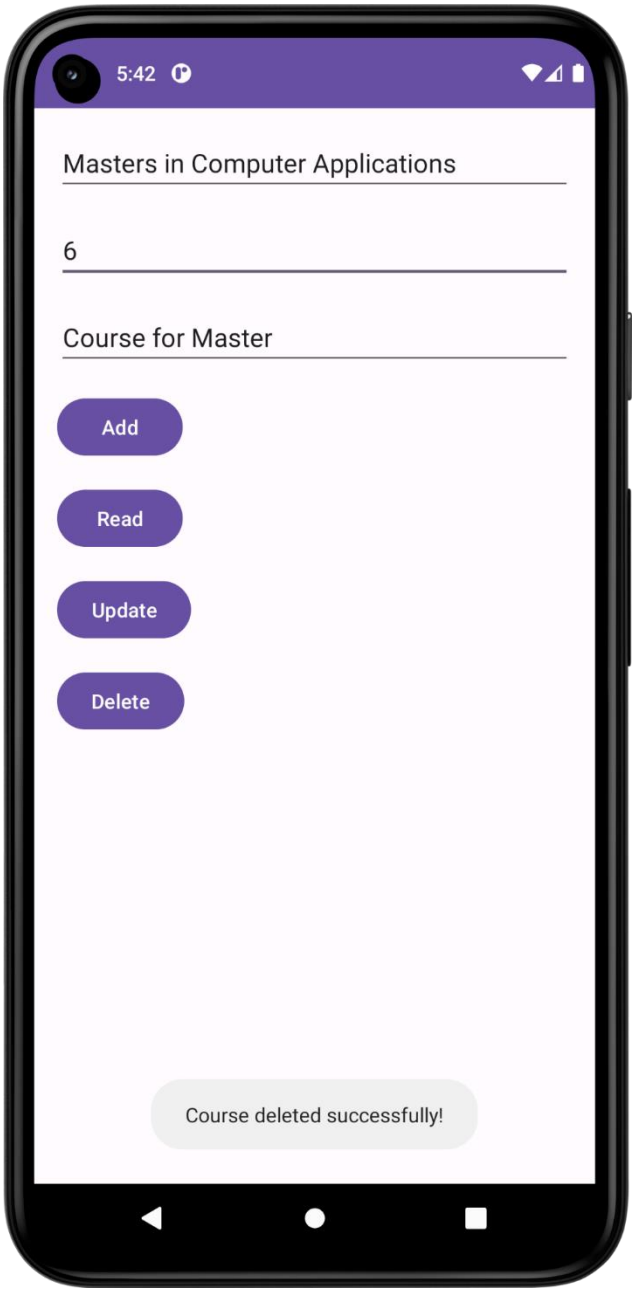
Output:-

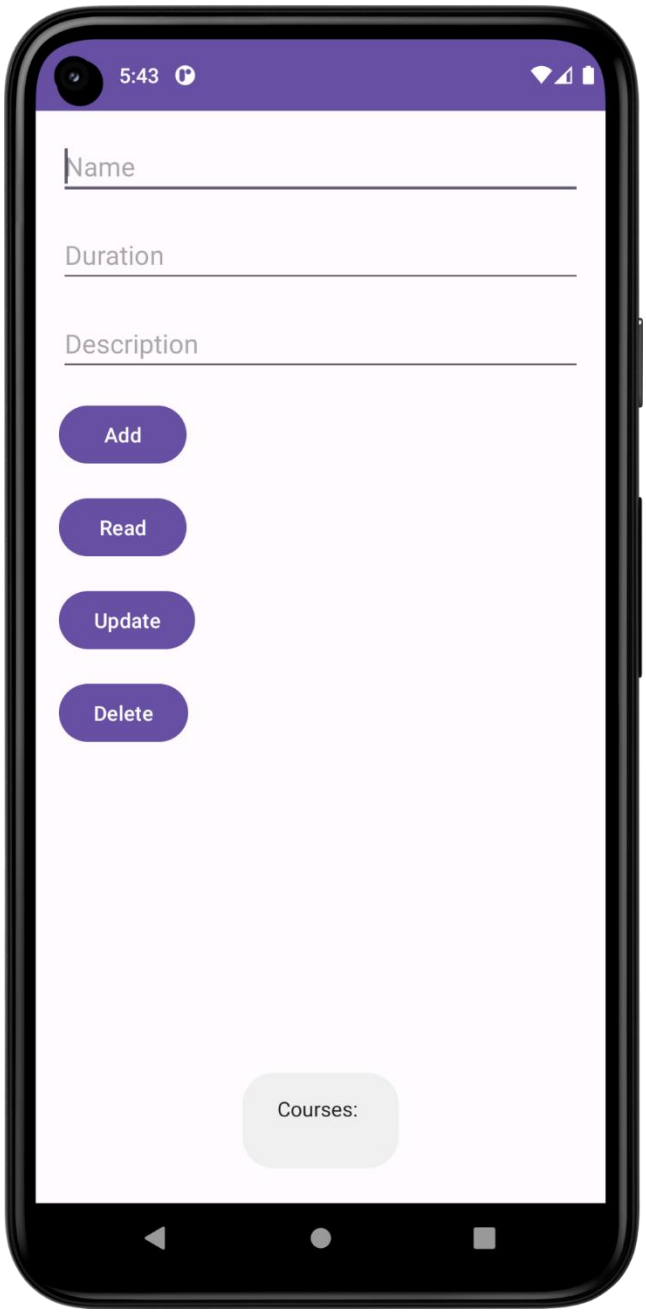

5:04
Master in Computer Applications
2
Course for Masters
Add
Read
Update
Delete
Course added successfully!


5:15
Master in Computer Applications
2
Course for Masters
Add
Read
Update
Delete
Courses:
ID: 2, Name: Master in Computer Applications, Duration: 2, Description: Course for Masters


5:42
Masters in Computer Applications
6
Course for Master
Add
Read
Update
Delete
Courses:
ID: 1, Name: Masters in Computer Applications, Duration: 6, Description: Course for Master


5:41
Masters in Computer Applications
6
Course for Master
Add
Read
Update
Delete
Course updated successfully!


5:42
Masters in Computer Applications
6
Course for Master
Add
Read
Update
Delete
Course deleted successfully!


5:43
Name
Duration
Description
Add
Read
Update
Delete
Courses:

Q20. Create an Android app, powered by Firebase Realtime database that supports: Adding Data to Firebase Realtime database, Retrieving Data from Firebase and Deleting data from firebase data.

Activity_main.xml

```
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/editTextData"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter data"/>

    <Button
        android:id="@+id/btnAdd"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add Data"/>

    <Button
        android:id="@+id/btnRetrieve"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="Retrieve Data"/>

    <Button
        android:id="@+id/btnDelete"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Delete Data"/>

    <TextView
        android:id="@+id/textViewData"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"/>
</LinearLayout>
```

MainActivity.java

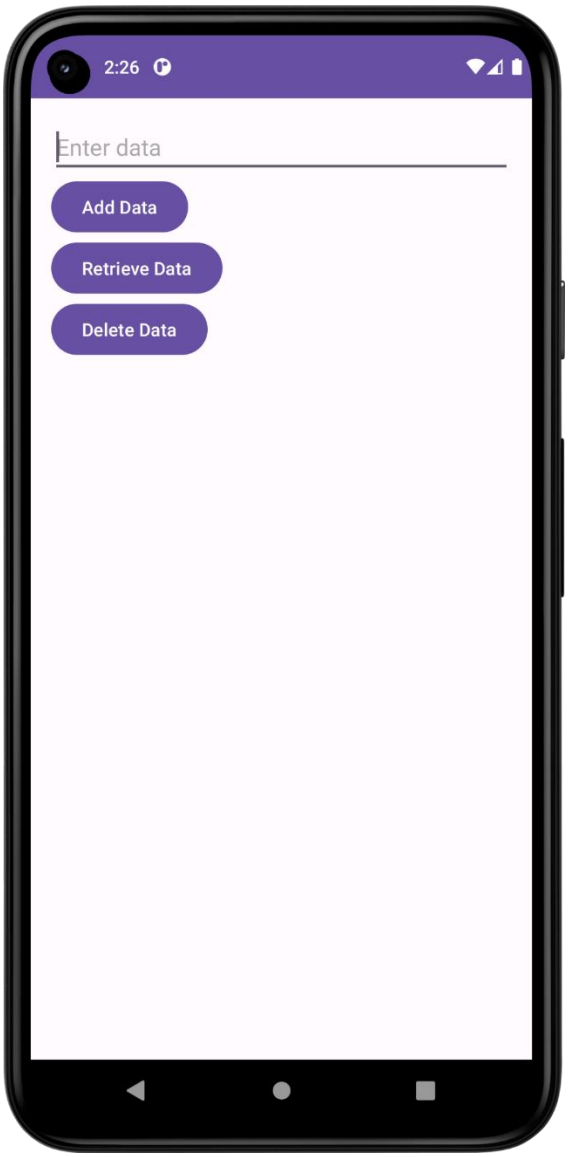
```
package com.example.a20;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import com.google.firebase.database.*;
```

```
public class MainActivity extends AppCompatActivity {

    private EditText editTextData;
    private TextView textViewData;
    private DatabaseReference database;

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

        editTextData = findViewById(R.id.editTextData);
        textViewData = findViewById(R.id.textViewData);

        // Get the Firebase reference
        database = FirebaseDatabase.getInstance().getReference();

        Button btnAdd = findViewById(R.id.btnAdd);
        Button btnRetrieve = findViewById(R.id.btnRetrieve);
        Button btnDelete = findViewById(R.id.btnDelete);

        btnAdd.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                addData();
            }
        });

        btnRetrieve.setOnClickListener(new View.OnClickListener() {
            @Override
```

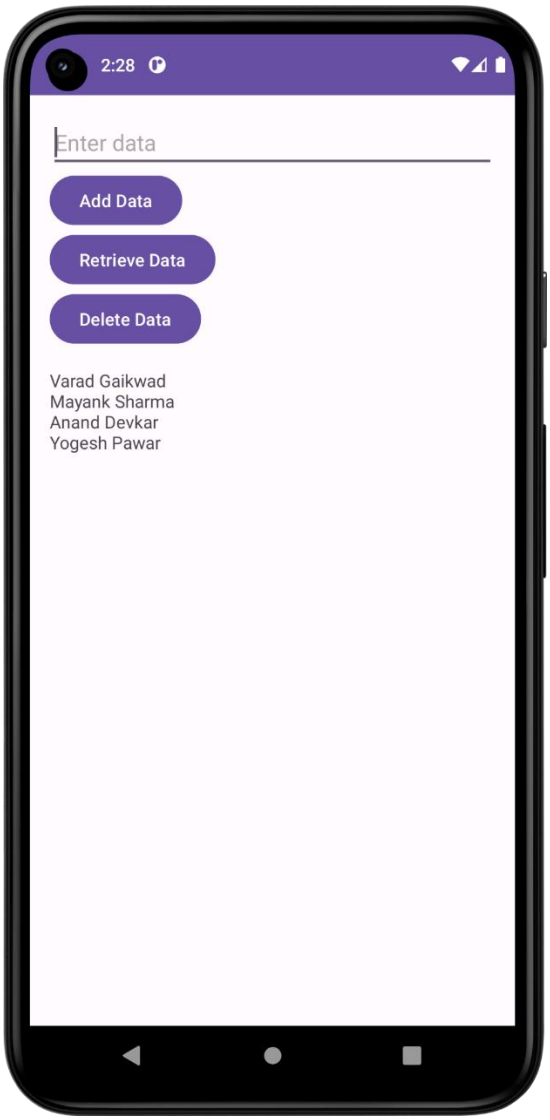
```
        public void onClick(View view) {
            retrieveData();
        }
    });

    btnDelete.setOnClickListener(new View.OnClickListener() {
        @Override
        public void onClick(View view) {
            deleteData();
        }
    });
}

private void addData() {
    String data = editTextData.getText().toString().trim();

    if (!data.isEmpty()) {
        String key = database.child("data").push().getKey();

        if (key != null) {
            database.child("data").child(key).setValue(data);
            editTextData.getText().clear();
        }

    }
}

private void retrieveData() {
    database.child("data").addListenerForSingleValueEvent(new ValueEventListener() {
        @Override
```

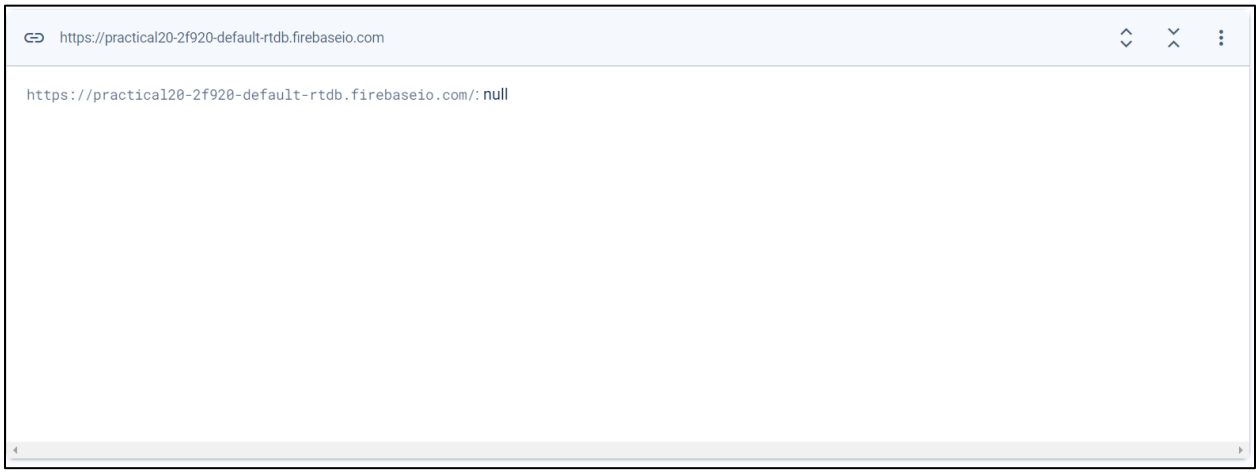
```
            public void onDataChange(@NonNull DataSnapshot snapshot) {
                StringBuilder dataStringBuilder = new StringBuilder();

                for (DataSnapshot childSnapshot : snapshot.getChildren()) {
                    String data = childSnapshot.getValue(String.class);

                    if (data != null) {
                        dataStringBuilder.append(data).append("\n");
                    }
                }

                textViewData.setText(dataStringBuilder.toString());
            }

            @Override
            public void onCancelled(@NonNull DatabaseError error) {
                // Handle error
            }
        });
    }

    private void deleteData() {
        // Delete all data in the "data" node
        database.child("data").removeValue();
        textViewData.setText("");
    }
}
```

Output:-


2:26
Enter data
Add Data
Retrieve Data
Delete Data


https://practical20-2f920-default-rtdb.firebaseio.com
https://practical20-2f920-default-rtdb.firebaseio.com/
data
-NlKW-P03UJbO6a92xGm: "Varad Gaikwad"
-NlKW1QhwpDavCrVPxpZ: "Mayank Sharma"
-NlKW3BKM0QtbICUpKTz: "Anand Devkar"
-NlKW4g3CbwWq7Arw6Tc: "Yogesh Pawar"


2:28
Enter data
Add Data
Retrieve Data
Delete Data
Varad Gaikwad
Mayank Sharma
Anand Devkar
Yogesh Pawar


https://practical20-2f920-default-rtdb.firebaseio.com
https://practical20-2f920-default-rtdb.firebaseio.com/: null

Q21. Write an android app to write JSON data into a file and read JSON data from created file

Activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    tools:context=".MainActivity">

    <Button
        android:id="@+id/buttonWrite"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Write JSON to File"
        android:layout_centerHorizontal="true"
        android:layout_marginBottom="16dp"/>

    <Button
        android:id="@+id/buttonRead"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Read JSON from File"
        android:layout_below="@id/buttonWrite"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="16dp"
        android:layout_marginBottom="16dp"/>

    <TextView
        android:id="@+id/textViewOutput"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text=""
        android:layout_below="@id/buttonRead"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="16dp"/>

</RelativeLayout>
```

MainActivity.java

```
package com.example.a21;

import android.content.Context;
import android.os.Bundle;
import android.util.Log;
import android.view.View;
import android.widget.Button;
```

```
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
import org.json.JSONException;
import org.json.JSONObject;
import java.io.BufferedReader;
import java.io.FileOutputStream;
import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;

public class MainActivity extends AppCompatActivity {

    private static final String FILE_NAME = "json_data.json";
    private TextView textViewOutput;

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

        Button buttonWrite = findViewById(R.id.buttonWrite);
        Button buttonRead = findViewById(R.id.buttonRead);
        textViewOutput = findViewById(R.id.textViewOutput);

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

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

    private void writeJsonToFile() {
        try {
            // Create a JSON object
            JSONObject jsonObject = new JSONObject();
            jsonObject.put("name", "Bhupendra Jogi");
            jsonObject.put("age", 29);
            jsonObject.put("city", "New York");

            // Convert the JSON object to a string
            String jsonString = jsonObject.toString();

            // Write the JSON string to a file
```

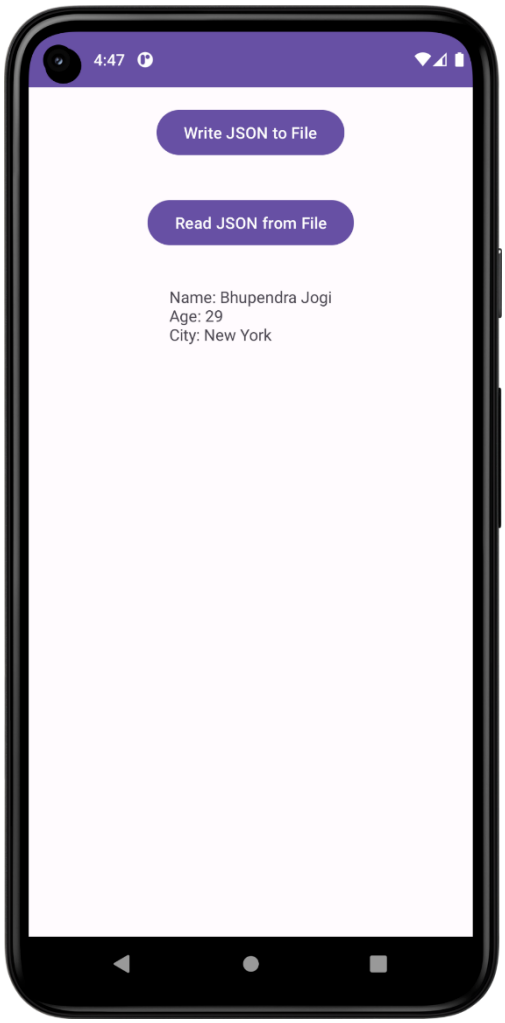
```
            FileOutputStream fileOutputStream = openFileOutput(FILE_NAME,
        Context.MODE_PRIVATE);
            fileOutputStream.write(jsonString.getBytes());
            fileOutputStream.close();

            Log.d("WriteJsonToFile", "JSON data written to file successfully");
        } catch (JSONException | IOException e) {
            e.printStackTrace();
        }
    }

    private void readJsonFromFile() {
        try {
            // Read the JSON string from the file
            InputStream inputStream = openFileInput(FILE_NAME);
            InputStreamReader inputStreamReader = new InputStreamReader(inputStream);
            BufferedReader bufferedReader = new BufferedReader(inputStreamReader);
            StringBuilder stringBuilder = new StringBuilder();
            String line;

            while ((line = bufferedReader.readLine()) != null) {
                stringBuilder.append(line);
            }

            inputStream.close();

            // Convert the JSON string to a JSON object
            JSONObject jsonObject = new JSONObject(stringBuilder.toString());

            // Display the JSON data in the TextView
            String output = "Name: " + jsonObject.getString("name") +
                    "\nAge: " + jsonObject.getInt("age") +
                    "\nCity: " + jsonObject.getString("city");

            textViewOutput.setText(output);

            Log.d("ReadJsonFromFile", "JSON data read from file successfully");
        } catch (JSONException | IOException e) {
            e.printStackTrace();
        }
    }
}
```

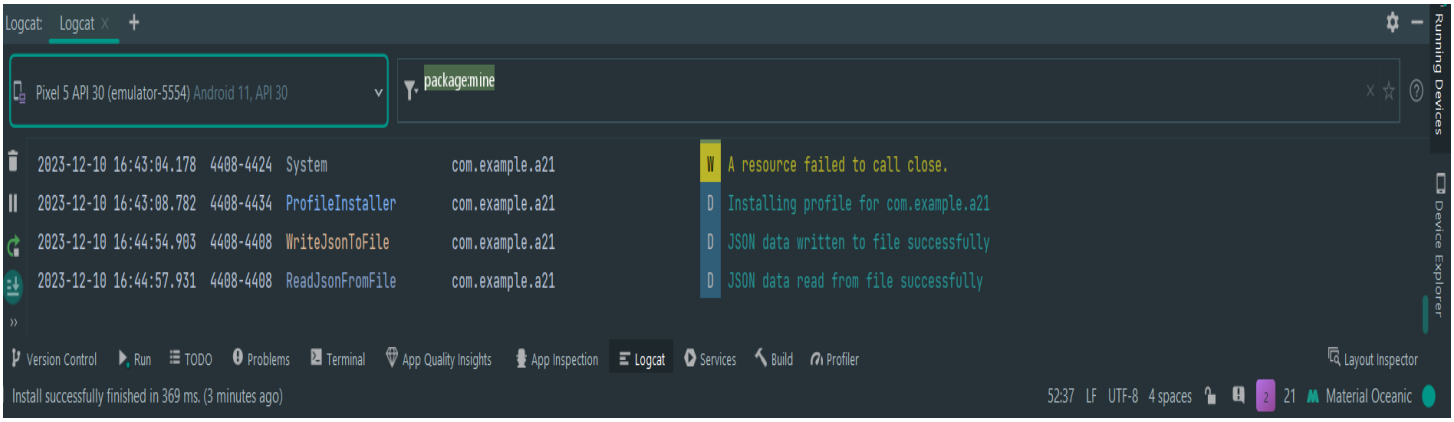
AndroidManifest.xml

```
<uses-permission android:name="android.permission.WRITE_EXTERNAL_STORAGE" />
<uses-permission android:name="android.permission.READ_EXTERNAL_STORAGE" />
```

Output:-


4:43
Write JSON to File
Read JSON from File


4:47
Write JSON to File
Read JSON from File
Name: Bhupendra Jogi
Age: 29
City: New York


Logcat: Logcat
Pixel 5 API 30 (emulator-5554) Android 11, API 30
package:mine
2023-12-10 16:43:04.178 4408-4424 System com.example.a21
W A resource failed to call close.
2023-12-10 16:43:08.782 4408-4434 ProfileInstaller com.example.a21
D Installing profile for com.example.a21
2023-12-10 16:44:54.903 4408-4408 WriteJsonToFile com.example.a21
D JSON data written to file successfully
2023-12-10 16:44:57.931 4408-4408 ReadJsonFromFile com.example.a21
D JSON data read from file successfully
Version Control
Run
TODO
Problems
Terminal
App Quality Insights
App Inspection
Logcat
Services
Build
Profiler
Layout Inspector
Install successfully finished in 369 ms. (3 minutes ago)
52:37 LF UTF-8 4 spaces
Material Oceanic
Running Devices
Device Explorer

Q**22.Demonstrate flutter application using android.**

```
import 'package:flutter/material.dart';

void main() {
  runApp(MyApp());
}

class MyApp extends StatelessWidget {
  @override
  Widget build(BuildContext context) {
    return MaterialApp(
      title: 'Flutter Counter App',
      theme: ThemeData(
        primarySwatch: Colors.blue,
      ),
      home: MyHomePage(),
    );
  }
}

class MyHomePage extends StatefulWidget {
  @override
  _MyHomePageState createState() => _MyHomePageState();
}

class _MyHomePageState extends State<MyHomePage> {
  int _counter = 0;

  @override
  Widget build(BuildContext context) {
    return Scaffold(
      appBar: AppBar(
        title: Text('Counter App'),
      ),
      body: Center(
        child: Column(
          mainAxisAlignment: MainAxisAlignment.center,
          children: <Widget>[
            Text(
              'Counter:',
              style: TextStyle(fontSize: 20),
            ),
            Text(
              '$_counter',
              style: TextStyle(fontSize: 40, fontWeight: FontWeight.bold),
            ),
          ],
        ),
      ),
      floatingActionButton: FloatingActionButton(
        onPressed: _incrementCounter,
```

```
        tooltip: 'Increment',
        child: Icon(Icons.add),
      ),
    );

  }

  void _incrementCounter() {
    setState(() {
      _counter++;
    });
  }
}
```

Output :