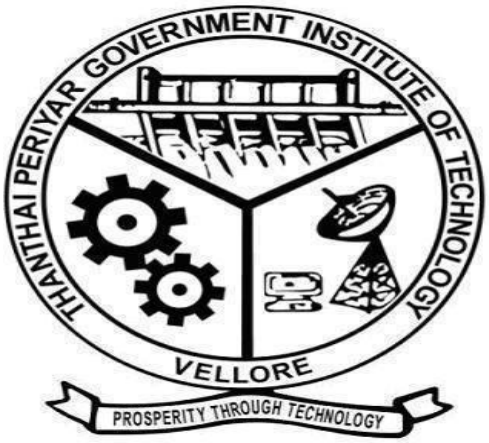
ANNA UNIVERSITY

THANTHAI PERIYAR

GOVERNMENT INSTITUTE OF TECHNOLOGY

VELLORE-632 002



MASTER OF COMPUTER APPLICATIONS

MC4204– MOBILE APPLICATION DEVELOPMENT

Name: _____

Reg. No: _____

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VELLORE-632 002

MASTER OF COMPUTER APPLICATIONS

MC4204–MOBILE APPLICATION DEVELOPMENT LABORATORY

2023 – 2025

Certified that this is a bonafide record of work done by . . . . . With Reg. no . . . . . in this department during the academic year of 2023 – 2024.

Staff Incharge **Head of the Department**

Date:

Submitted for M.C.A Degree Practical Examination (II Semester) held on …… at TPGIT Bagayam, Vellore – 2.

Internal Examiner **External Examiner**

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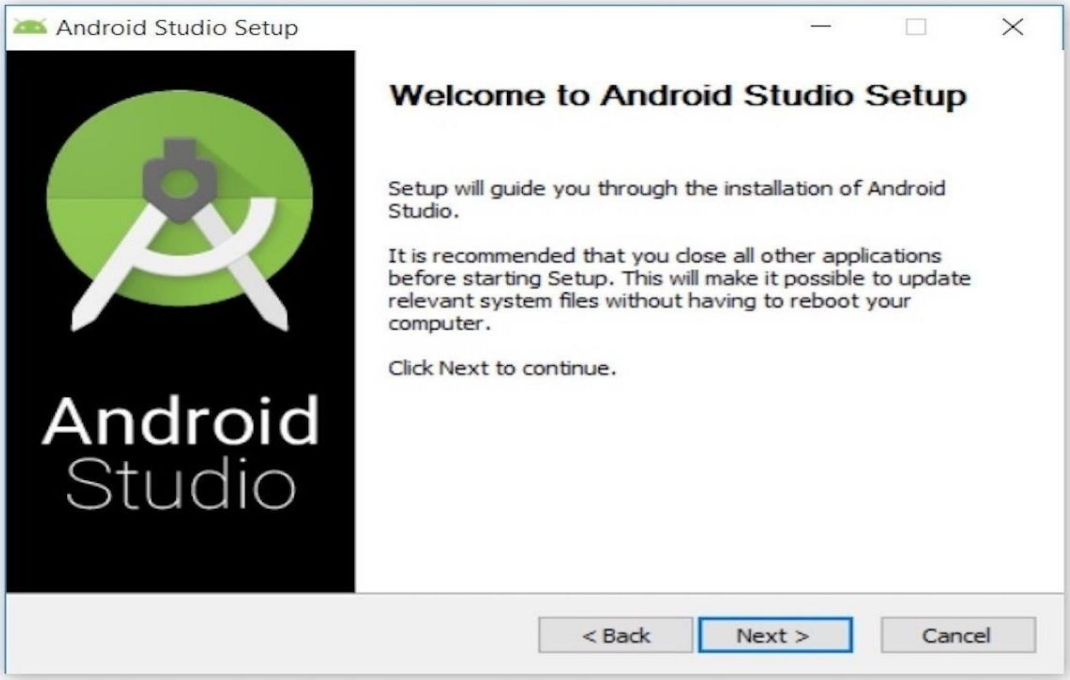
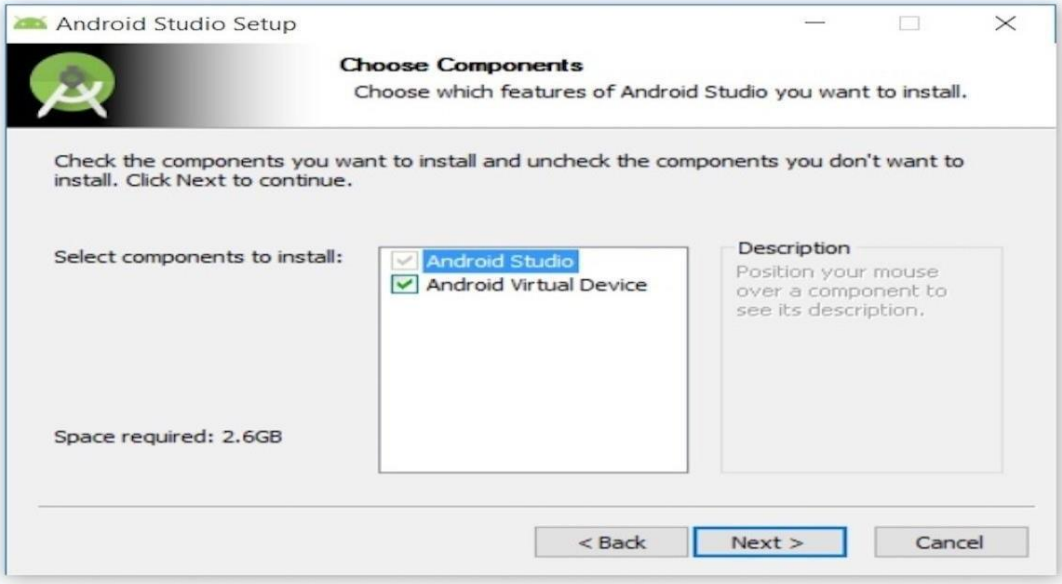
1. INSTALLATION OF NECESSARY COMPONENTS AND SOFTWARE

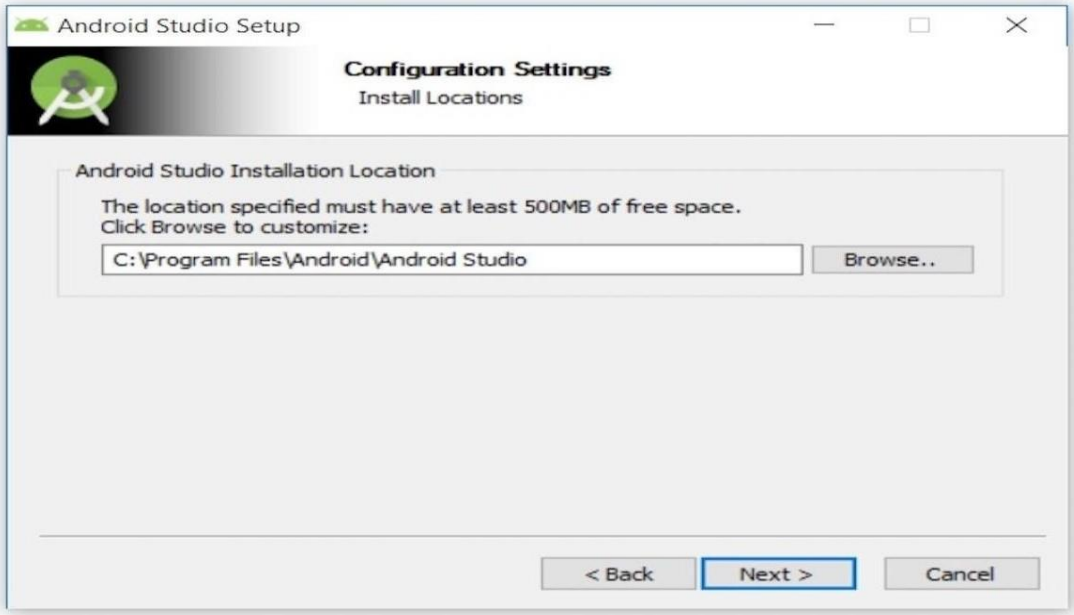
The installer responded by presenting the **Android Studio Setup** dialog box .



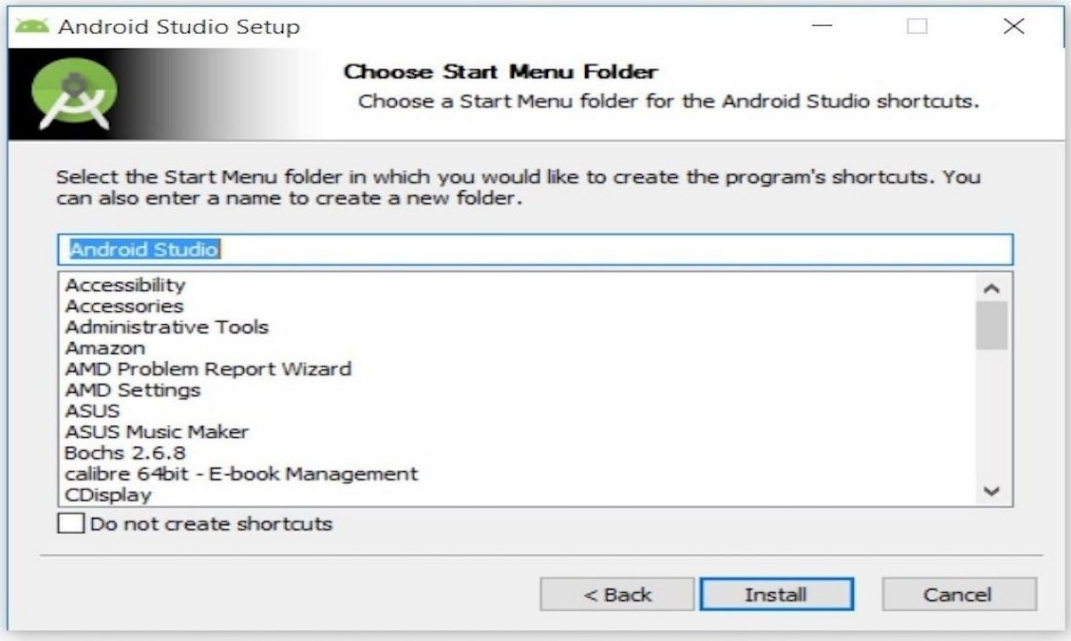
Click **Next** which provides the option to decline installing an Android Virtual Device (AVD).



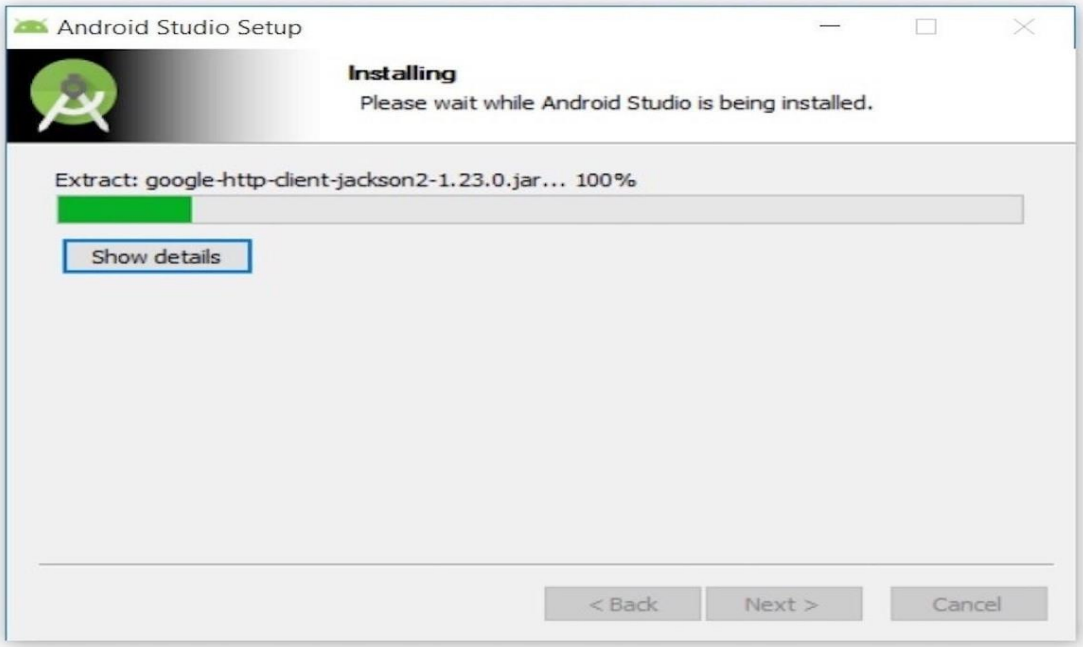
Click **Next** in the **Configuration Settings** panel to install Android Studio.



Keep the default installation location and click **Next**, and then **Choose Start Menu Folder** panel.

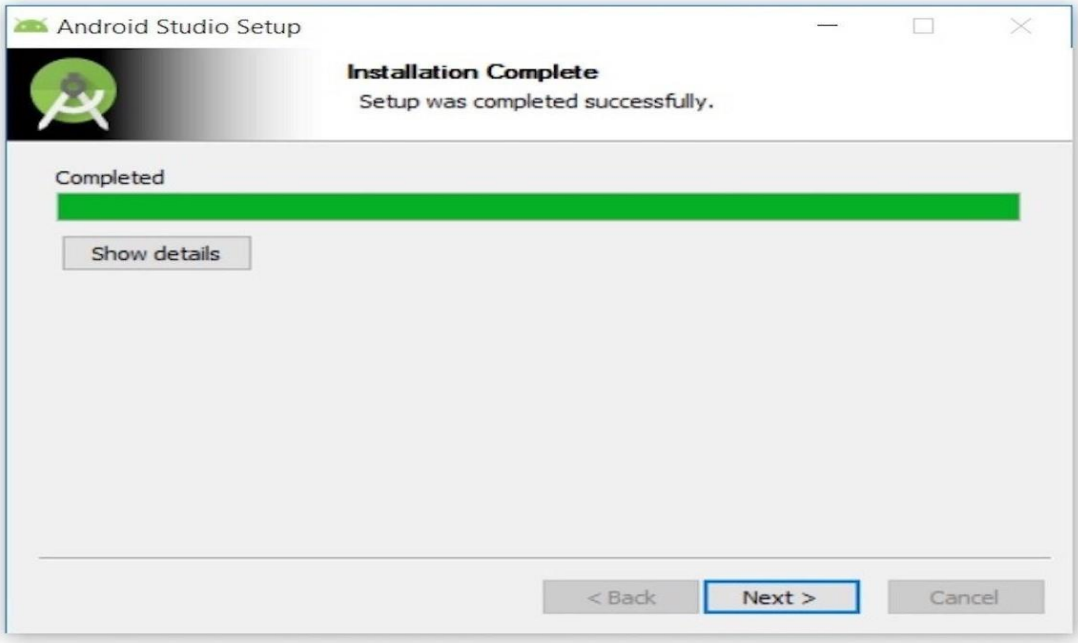


keep the default setting and click **Install**. The following **Installing** panel appeared:



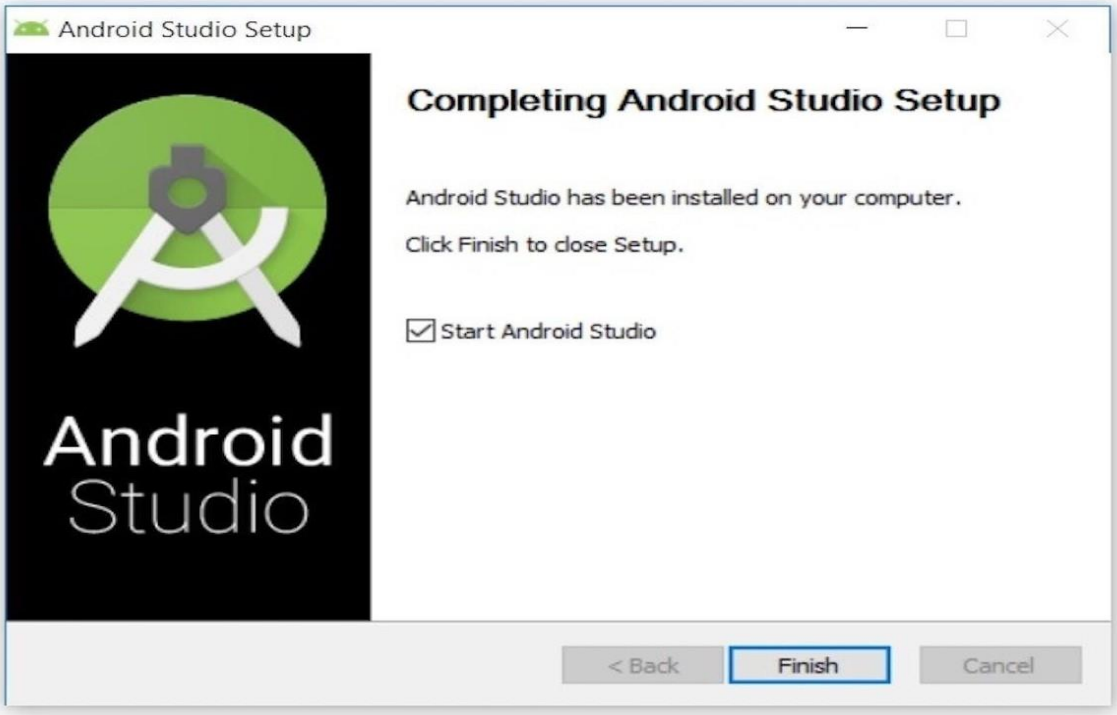
This panel shows the progress of the installation

Clicking **Show details** causes the names of files being installed and other activities to be displayed. When installation finished, the **Installation Complete** panel appeared.



The Next button is enabled when installation completes

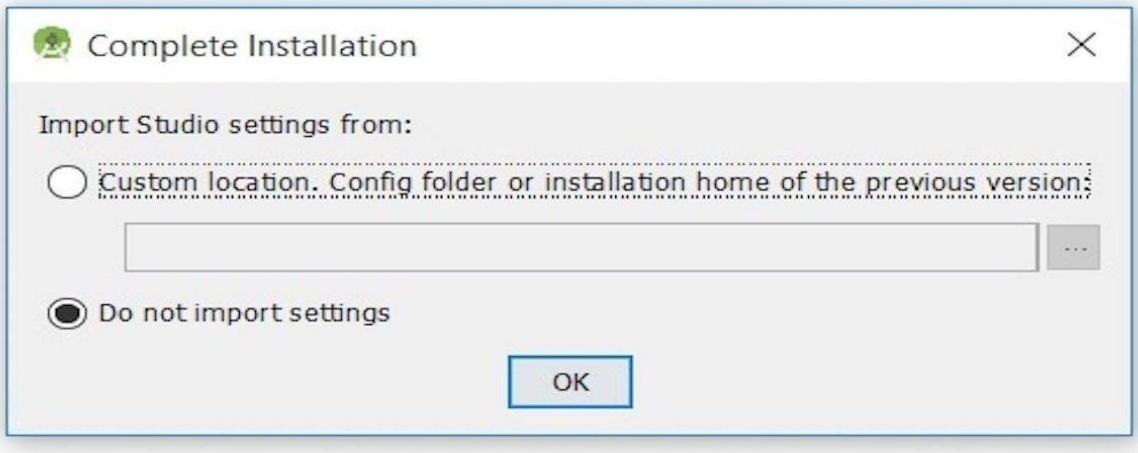
After clicking **Next**, the installer presented the **Completing Android Studio Setup** panel.



Leave the Start Android Studio checkbox checked to run this software
To complete the installation, I left the **Start Android Studio** box checked and clicked **Finish**.

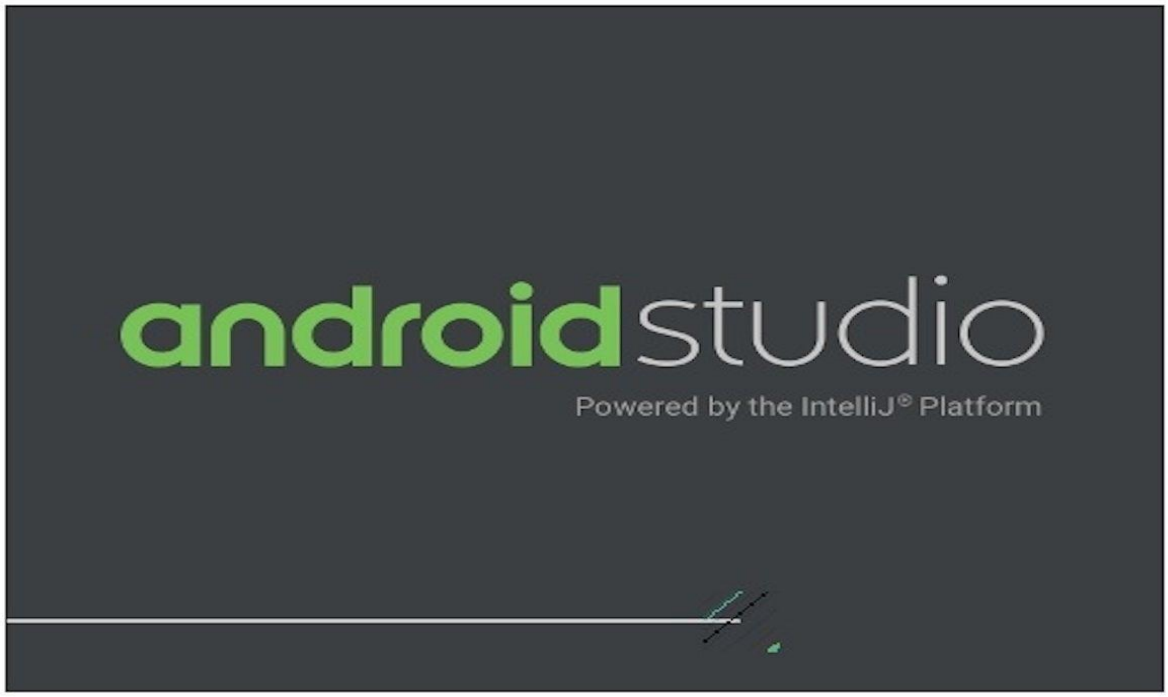
Running Android Studio

The first time Android Studio runs, it presents a **Complete Installation** dialog box that offers the option of importing settings from a previous installation.



A previous installation's settings can be imported

I chose not to import settings (the default selection) and clicked **OK**, and was rewarded with the following splash screen:

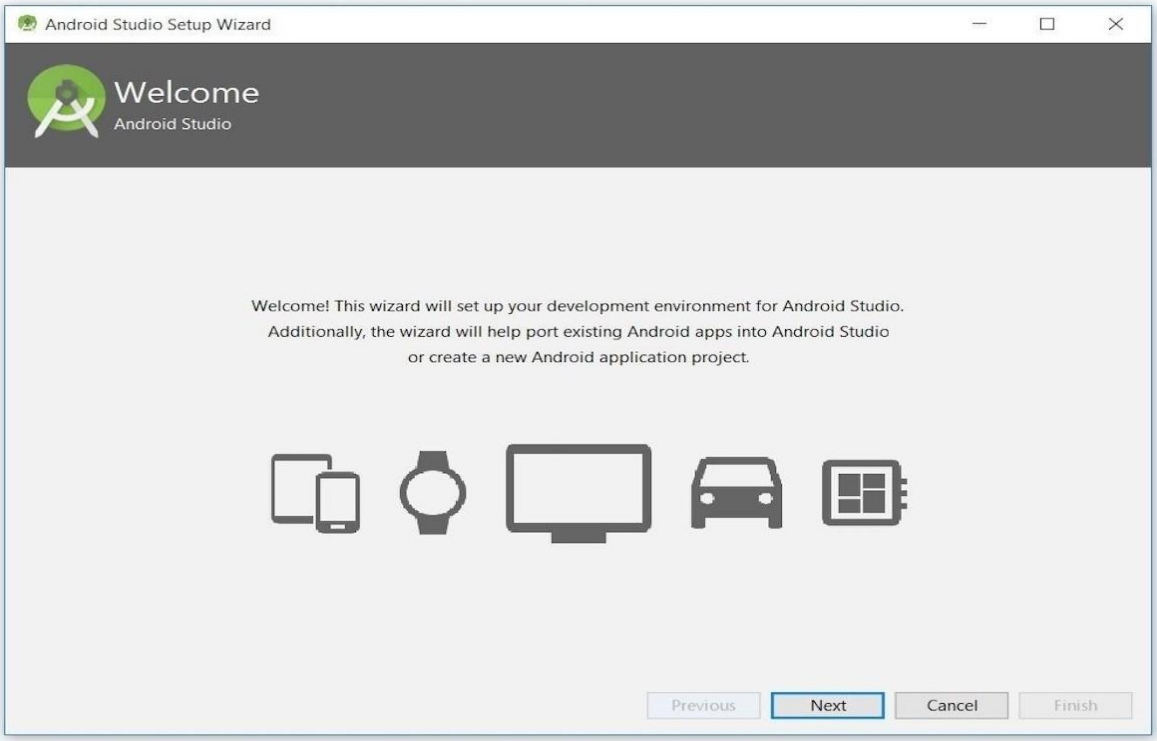


Android Studio's splash screen

I also observed the following **Finding Available SDK Components** message box.

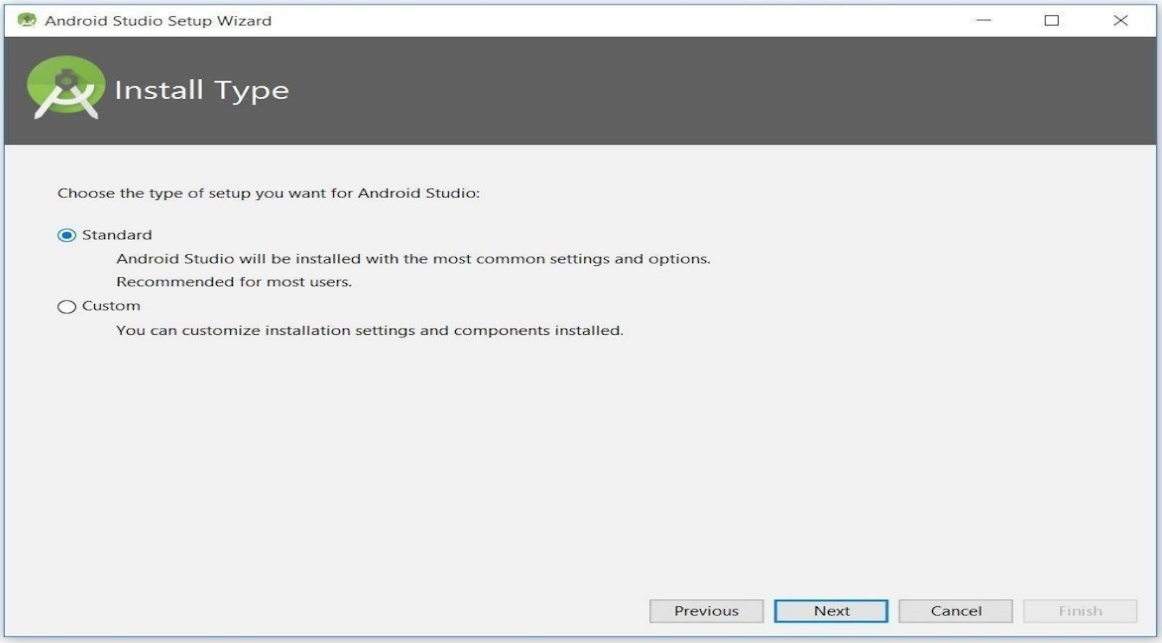
Android Studio downloads any SDK components that are needed (and available)

At this point, Android Studio presented the following **Android Studio Setup Wizard** dialog box:



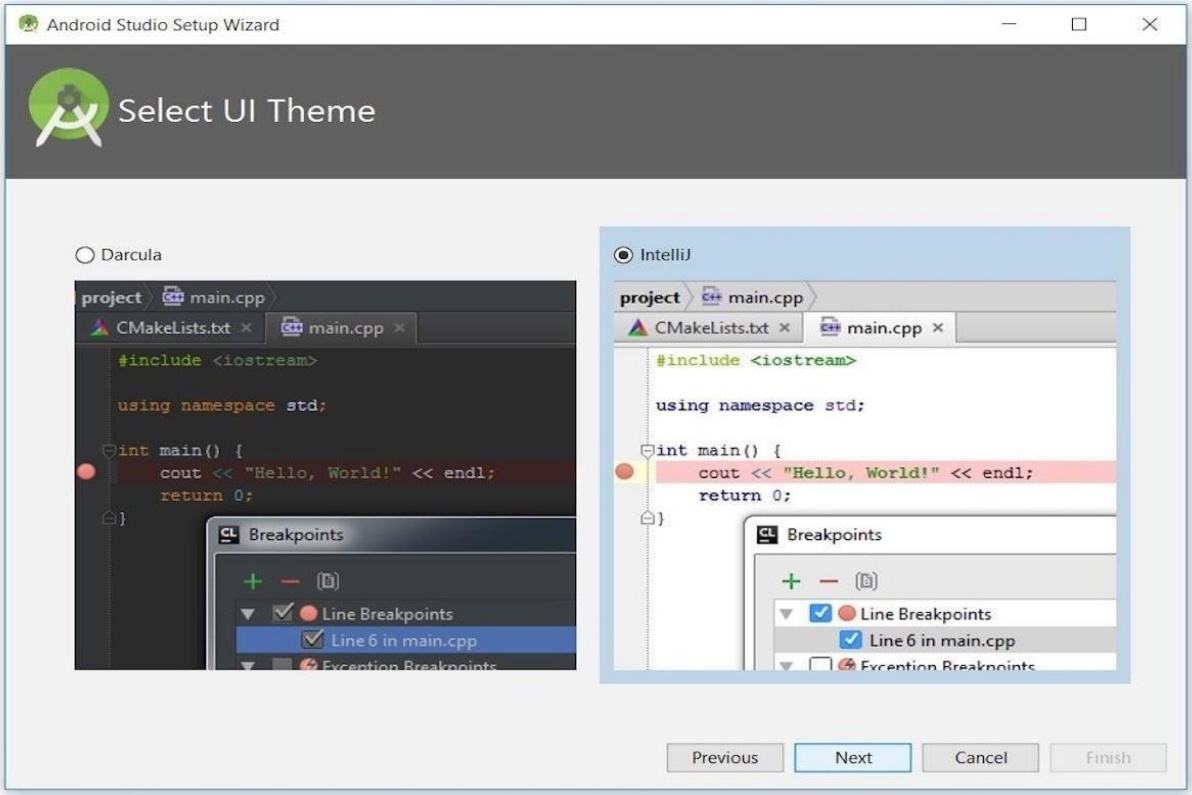
The wizard provides setup and app-porting capabilities

I clicked **Next**, and the wizard invited me to select an installation type. I kept the default standard setting.



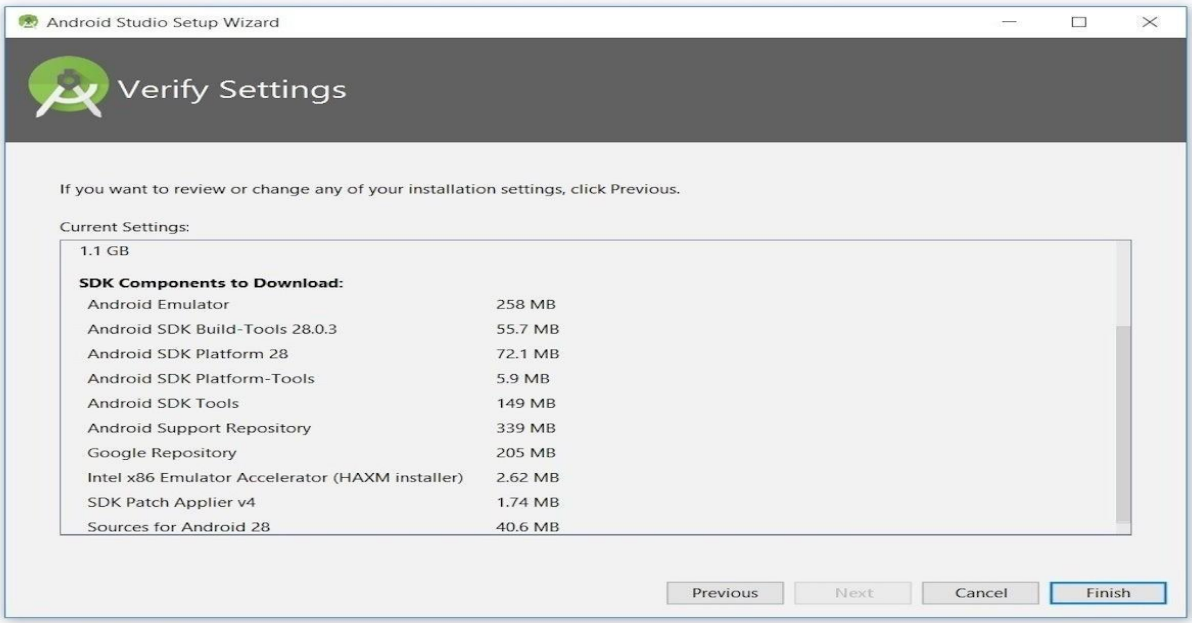
Choose an installation type

I was then given the opportunity to choose a user interface theme.



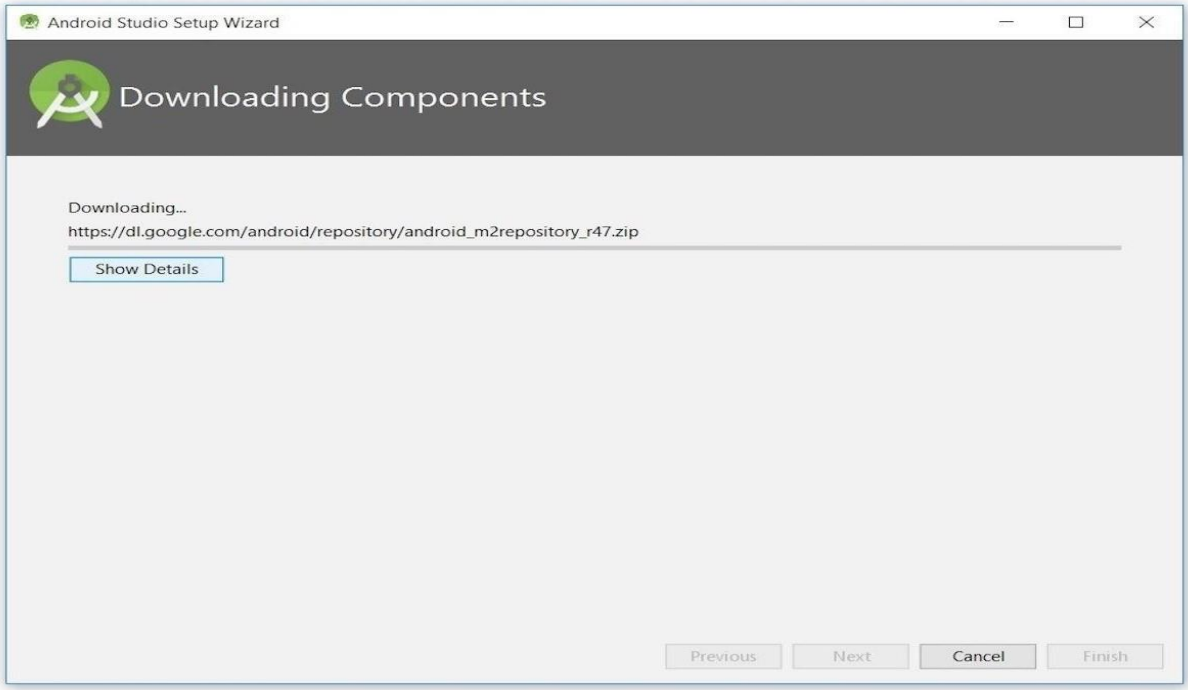
Put the bite on Android Studio by choosing the Darcula theme

I kept the default **IntelliJ** setting and clicked **Next**. Android Studio next provided the opportunity to verify settings.



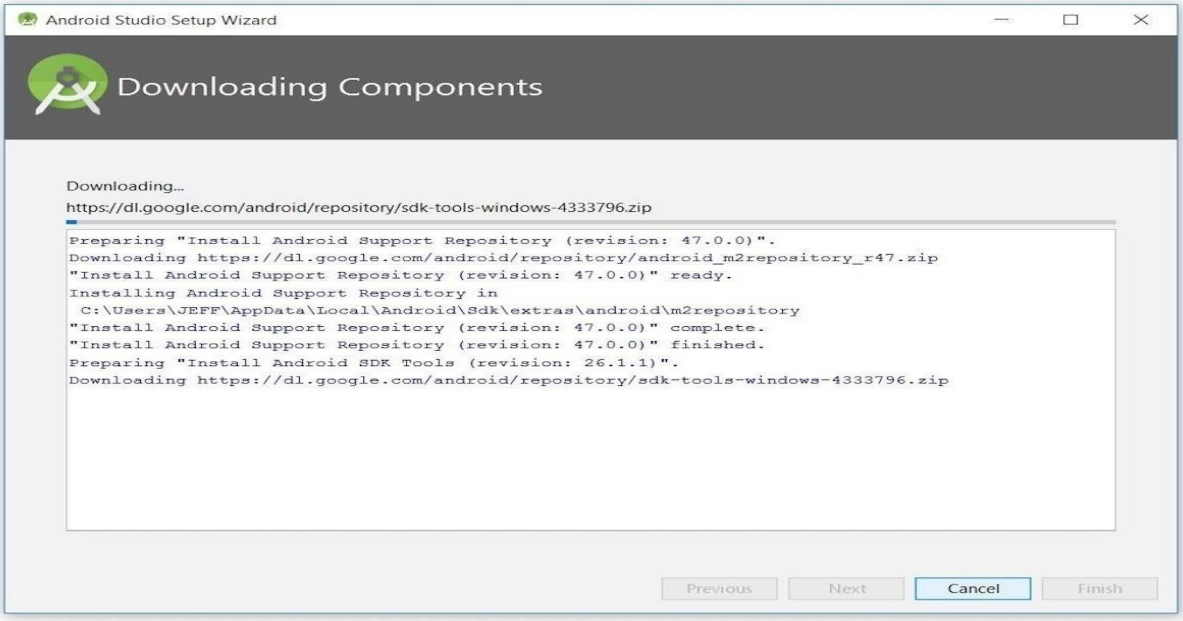
Android Studio identifies additional SDK components that will be downloaded (click to enlarge)

I clicked **Finish** and Android Studio began the process of downloading SDK components.



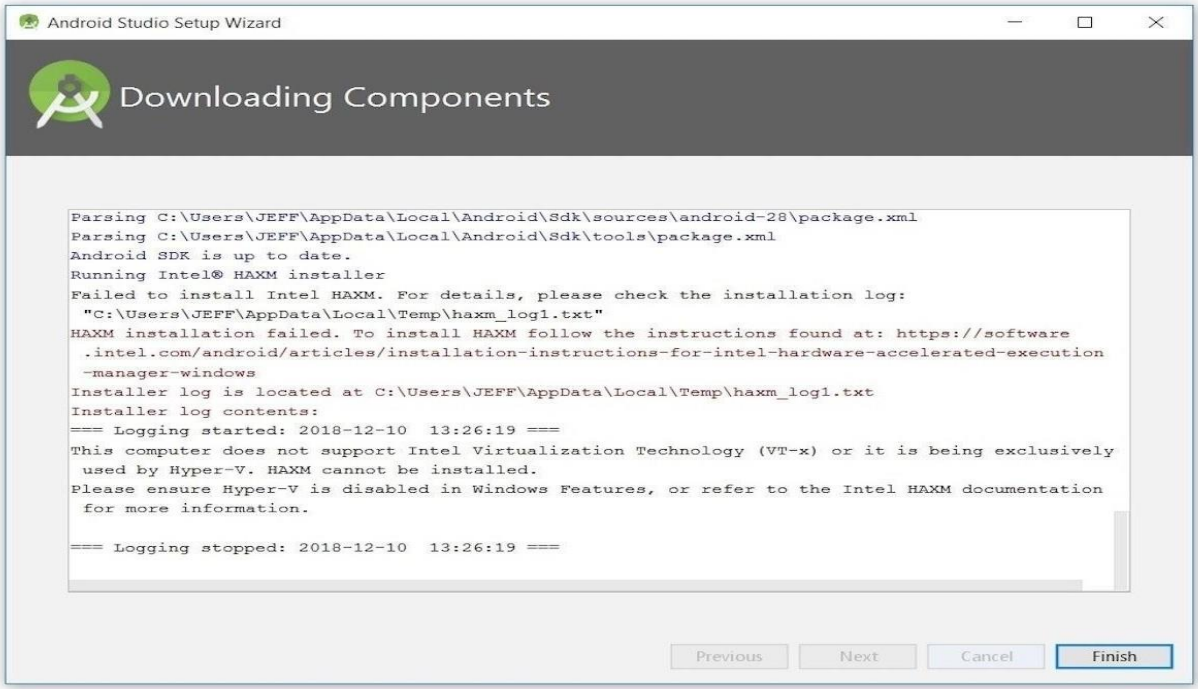
The wizard downloads and unzips SDK components

It can take several minutes for this part of the setup to finish. Clicking **Show Details** might relieve some boredom by revealing the various files being downloaded and unzipped.



The wizard identifies the various archives being downloaded

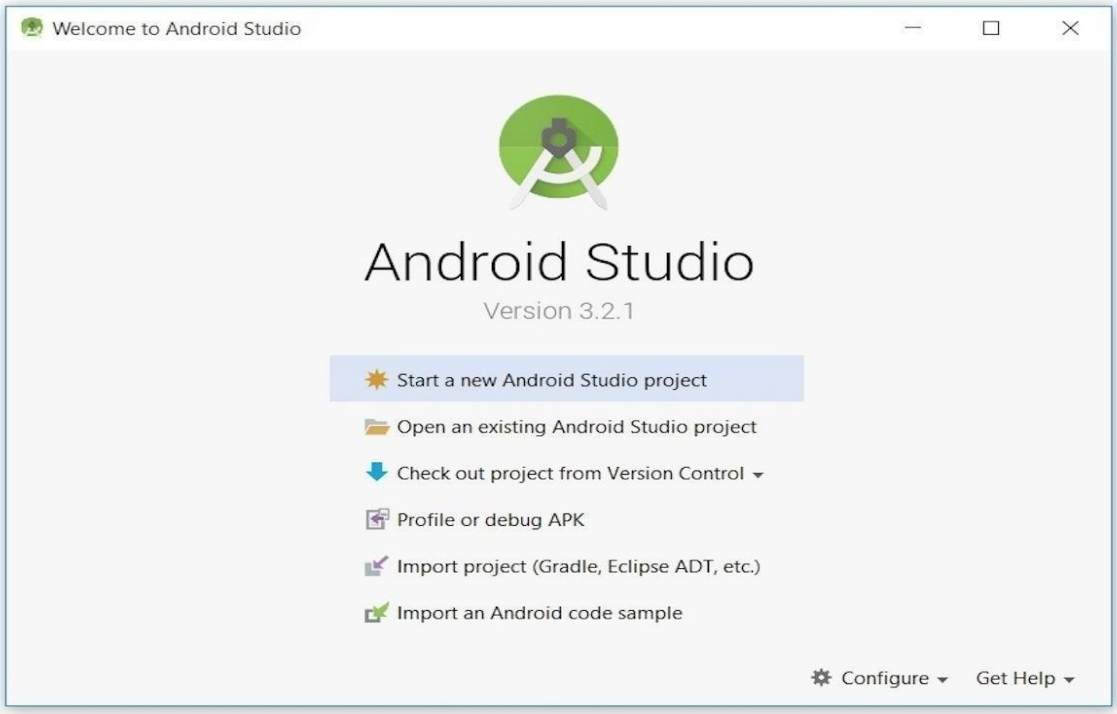
For my AMD-based computer, an unpleasant surprise awaited after the components had completely downloaded and unzipped:



Intel-based hardware acceleration is unavailable

My options are to either put up with the slow emulator or use an Android device to speed up development. In Part 3 I'll show you how I resolved this issue.

Finally, I clicked **Finish** to complete the wizard. The **Welcome to Android Studio** dialog box appeared.



Welcome to Android Studio

This dialog box is used to start up a new Android Studio project, work with an existing project, and more. It can be accessed by selecting **Android Studio** from the Windows **Start** menu, or the equivalent on another platform.

2. IMPLEMENT MOBILE APPLICATIONS USING UI TOOL KITS AND FRAMEWORKS

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"
    xmlns:card_view="http://schemas.android.com/apk/res-auto"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:gravity="center"
    android:background="@drawable/loginbkg"
    tools:context=".MainActivity">
    <androidx.cardview.widget.CardView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="30dp"
        app:cardCornerRadius="30dp"
        app:cardElevation="20dp">
        <LinearLayout
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
```

```
android:orientation="vertical"
android:layout_gravity="center_horizontal"
android:padding="24dp">
<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Login"
    android:id="@+id/loginText"
    android:textSize="36sp"
    android:textAlignment="center"
    android:textStyle="bold" />
<EditText
    android:layout_width="match_parent"
    android:layout_height="50dp"
    android:id="@+id/username"
    android:drawableLeft="@drawable/ic_baseline_person_24"
    android:drawablePadding="8dp"
    android:hint="Username"
    android:padding="8dp"
    android:textColor="@color/black"
    android:textColorHighlight="@color/cardview_dark_background"
    android:layout_marginTop="40dp"/>
<EditText
    android:layout_width="match_parent"
    android:layout_height="50dp"
```

```
            android:id="@+id/password"
            android:drawableLeft="@drawable/ic_baseline_lock_24"
            android:drawablePadding="8dp"
            android:hint="Password"
            android:padding="8dp"
            android:inputType="textPassword"
            android:textColor="@color/black"
            android:textColorHighlight="@color/cardview_dark_background"
            android:layout_marginTop="20dp"/>
        <Button
            android:layout_width="match_parent"
            android:layout_height="60dp"
            android:id="@+id/loginButton"
            android:text="Login"
            android:textSize="18sp"
            android:layout_marginTop="30dp"
            app:cornerRadius = "20dp"/>
    </LinearLayout>
</androidx.cardview.widget.CardView>
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:padding="8dp"
    android:text="Not yet registered? SignUp Now"
    android:textSize="14sp"
```

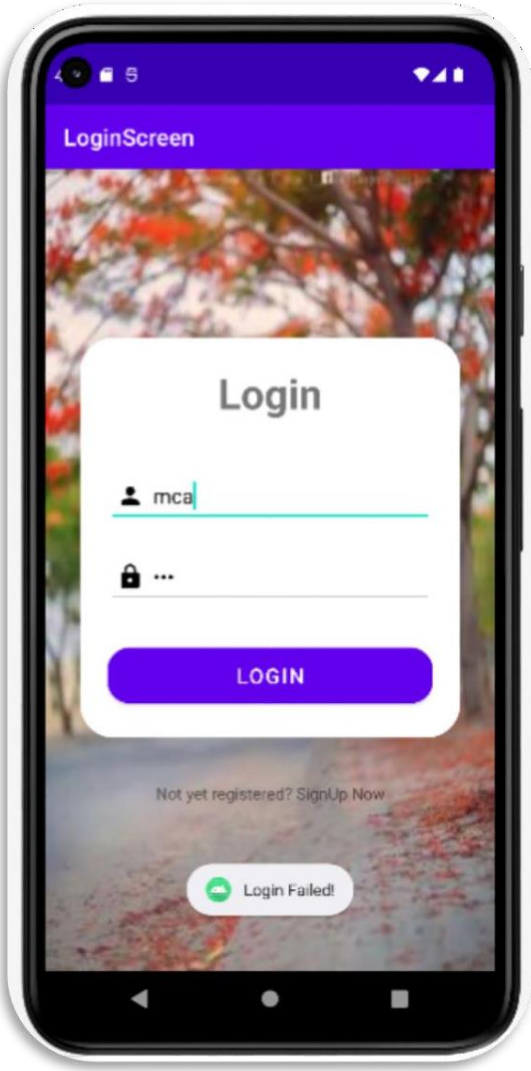
```
        android:textAlignment="center"
        android:id="@+id/signupText"
        android:layout_marginBottom="20dp"/>
</LinearLayout>
```

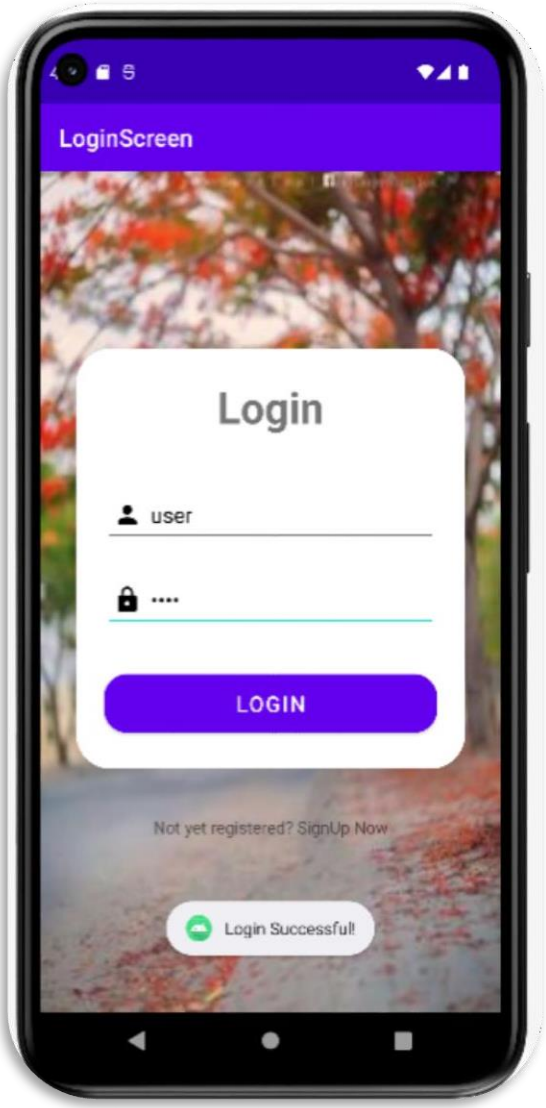
MainActivity.java:

```
package com.example.loginscreen;
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 username;
    EditText  password;
    Button  loginButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        username = findViewById(R.id.username);
        password = findViewById(R.id.password);
        loginButton = findViewById(R.id.loginButton);
        loginButton.setOnClickListener(new View.OnClickListener() {
            @Override
```

```
        public void onClick(View view) {

            if (username.getText().toString().equals("user") &&
password.getText().toString().equals("1234")) {

                Toast.makeText(MainActivity.this, "Login Successful!",
Toast.LENGTH_SHORT).show();

            } else {

                Toast.makeText(MainActivity.this, "Login Failed!",
Toast.LENGTH_SHORT).show();

            }

        }

    });

  }

}
```

OUTPUT:


LoginScreen
Login
mca
LOGIN
Not yet registered? SignUp Now
Login Failed!


LoginScreen
Login
user
LOGIN
Not yet registered? SignUp Now
Login Successful!

3. DESIGN AN APPLICATION THAT USES LAYOUT MANAGERS AND EVENT LISTENERS

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="15dp"
        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.exno2;

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

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    //Defining the Views
    EditText e1,e2;
    Button bt;
    Spinner s;
```

```
    //Data for populating in Spinner
    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);

        //Referring the Views
        e1= (EditText) findViewById(R.id.editText);
        e2= (EditText) findViewById(R.id.editText2);

        bt= (Button) findViewById(R.id.button);

        s= (Spinner) findViewById(R.id.spinner);

        //Creating Adapter for Spinner for adapting the data from array to Spinner
        ArrayAdapter adapter= new
ArrayAdapter(MainActivity.this,android.R.layout.simple_spinner_item,dept_array);
        s.setAdapter(adapter);

        //Creating Listener for Button
        bt.setOnClickListener(new View.OnClickListener() {
```

```
        @Override
        public void onClick(View v) {

            //Getting the Values from Views(Edittext & Spinner)
            name=e1.getText().toString();
            reg=e2.getText().toString();
            dept=s.getSelectedItem().toString();

            //Intent For Navigating to Second Activity
            Intent i = new Intent(MainActivity.this,SecondActivity.class);

            //For Passing the Values to Second Activity
            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.devang.exno2.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.exno2;

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

import androidx.appcompat.app.AppCompatActivity;

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);

        //Getting the Intent
        Intent i = getIntent();

        //Getting the Values from First Activity using the Intent received
        name=i.getStringExtra("name_key");
        reg=i.getStringExtra("reg_key");
        dept=i.getStringExtra("dept_key");

        //Setting the Values to Intent
        t1.setText(name);
        t2.setText(reg);
        t3.setText(dept);

    }
}
```

OUTPUT:


12:23
ex.no.2
Details Form
Name
Jaffro.S
Reg No
513123622012
Dept
MCA
SUBMIT


12:23
ex.no.2
Jaffro.S
513123622012
MCA

4. DESIGN AN MOBILE APPLICATION THAT IS AWARE OF THE RESOURCES CONSTAINS OF MOBILE DEVICES

Activity_main.xml:

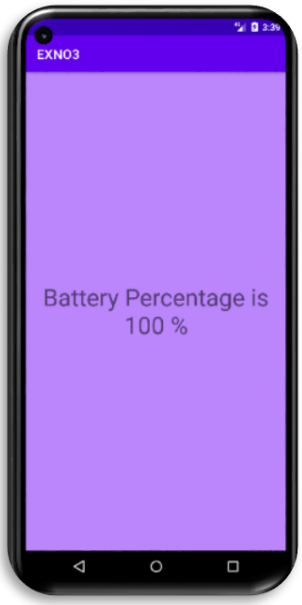
```
<?xml version = "1.0" encoding = "utf-8"?>
<LinearLayout xmlns:android = "http://schemas.android.com/apk/res/android"
    android:id = "@+id/parent"
    xmlns:tools = "http://schemas.android.com/tools"
    android:layout_width = "match_parent"
    android:layout_height = "match_parent"
    android:background="@color/purple_200"
    tools:context = "MainActivity"
    android:gravity = "center"
    android:orientation = "vertical">
    <TextView
        android:id = "@+id/text"
        android:textSize = "18sp"
        android:textAlignment = "center"
        android:text = "batter percentage"
        android:layout_width = "match_parent"
        android:layout_height = "wrap_content" />
</LinearLayout>
```

MainActivity.java:

```
package com.example.exno3;
import android.os.BatteryManager;
```

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

import androidx.annotation.RequiresApi;
import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    int view = R.layout.activity_main;
    TextView text;
    @RequiresApi(api = Build.VERSION_CODES.JELLY_BEAN)
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(view);
        text = findViewById(R.id.text);
        BatteryManager bm = (BatteryManager)getSystemService(BATTERY_SERVICE);
        if (android.os.Build.VERSION.SDK_INT >=
android.os.Build.VERSION_CODES.LOLLIPOP) {
            int percentage =
bm.getIntProperty(BatteryManager.BATTERY_PROPERTY_CAPACITY);
            text.setText("Battery Percentage is "+percentage+" %");
        }
    }
}
```

OUTPUT:



5. DESIGN AN APPLICATION THAT USES DYNAMIC LINKING

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayoutxmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:layout_width="match_parent"
android:layout_height="match_parent"
android:background="@drawable/gradient"
tools:context=".MainActivity">
<TextView
android:id="@+id/signin"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_marginStart="50dp"
android:layout_marginTop="50dp"
android:layout_marginEnd="50dp"
android:layout_marginBottom="50dp"
android:gravity="center"
android:text="Log In"
android:textColor="@color/white"
android:textSize="35dp"
android:textStyle="bold" />
<EditText
```

```
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/username"
android:layout_below="@id/signin"
android:background="#30ffffff"
android:hint="Username"
android:textColor="@color/white"
android:textColorHint="@color/white"
android:layout_margin="18dp"
android:drawableLeft="@drawable/baseline_person_outline_24"
android:padding="20dp"/>
<EditText
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/password"
android:layout_below="@id/username"
android:background="#30ffffff"
android:hint="password"
android:textColor="@color/white"
android:textColorHint="@color/white"
android:layout_margin="18dp"
android:drawableLeft="@drawable/baseline_password_24"
android:padding="20dp"
android:inputType="textPassword"/>
<com.google.android.material.button.MaterialButton
```

```
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/loginbtn"
android:layout_below="@id/password"
android:text="LOGIN"
android:backgroundTint="@color/design_default_color_secondary"
android:layout_centerHorizontal="true"
android:layout_margin="20dp"
    />
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/forgotpass"
android:layout_below="@id/loginbtn"
android:text="forgot password"
android:textColor="@color/white"
android:layout_centerHorizontal="true"
android:layout_margin="20dp"/>
<TextView
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:id="@+id/others"
android:layout_above="@id/socialicons"
android:text="or sign in with"
android:layout_centerHorizontal="true"/>
```

```
<LinearLayout
android:layout_width="match_parent"
android:layout_height="wrap_content"
android:id="@+id/socialicons"
android:layout_alignParentBottom="true"
android:gravity="center">
<ImageView
android:layout_width="48dp"
android:layout_height="48dp"
android:layout_margin="20dp"
android:src="@drawable/google"/>
<ImageView
android:layout_width="48dp"
android:layout_height="48dp"
android:layout_margin="20dp"
android:src="@drawable/facebook"/>
<ImageView
android:layout_width="48dp"
android:layout_height="48dp"
android:layout_margin="20dp"
android:src="@drawable/twitter"/>
</LinearLayout>

</RelativeLayout>
```

MainActivity.java:

```
package com.example.myapplication;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import com.google.android.material.button.MaterialButton;
import java.lang.reflect.InvocationTargetException;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import java.lang.reflect.InvocationTargetException;
public class MainActivity extends AppCompatActivity {
    private LoginModuleInterfaceloginModule;
    private EditTextusernameEditText;
    private EditTextpasswordEditText;
    private Button loginButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
super.onCreate(savedInstanceState);

setContentView(R.layout.activity_main);

      try {

         Class<?>moduleClass =
Class.forName("com.example.myapplication.LoginModule");

         Object moduleInstance =
moduleClass.getDeclaredConstructor(MainActivity.class).newInstance(this);

loginModule = (LoginModuleInterface) moduleInstance;

Toast.makeText(this, "Dynamic linking successfull", Toast.LENGTH_LONG).show();

      } catch (ClassNotFoundException | NoSuchMethodException |
IllegalAccessException |

InstantiationException | InvocationTargetException e) {

e.printStackTrace();

Toast.makeText(this, " Dynamic linking failed", Toast.LENGTH_SHORT).show();

      }

   // Find UI elements

usernameEditText = findViewById(R.id.username);

passwordEditText = findViewById(R.id.password);

loginButton = findViewById(R.id.loginbtn);

      //       Set       login       button       click       listener

loginButton.setOnClickListener(new View.OnClickListener() {

         @Override

         public void onClick(View v) {

performLogin();

         }

      });
```

```
        // Dynamically load the login module
    }
    private void performLogin() {
        if (loginModule != null) {
    Toast.makeText(this, " user verified", Toast.LENGTH_LONG).show();
            String username = usernameEditText.getText().toString();
            String password = passwordEditText.getText().toString();
    loginModule.login(username,  password);
        }
    }
    }
```

LoginModuleInterface.java:

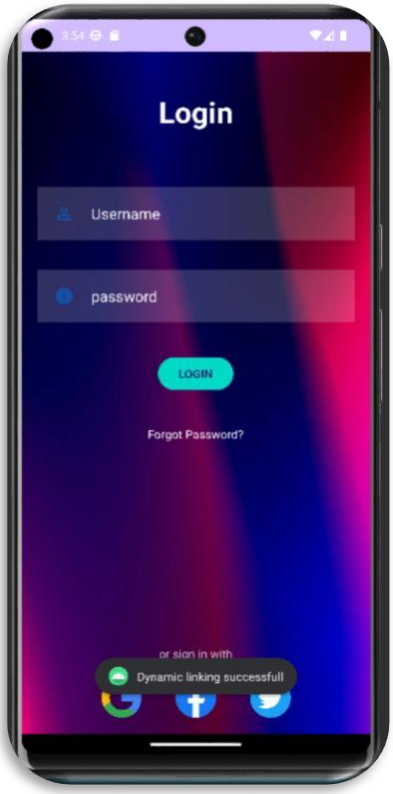
```
package com.example.myapplication;
public interface LoginModuleInterface {
  int login(String username, String password);
  void logout();
}
```

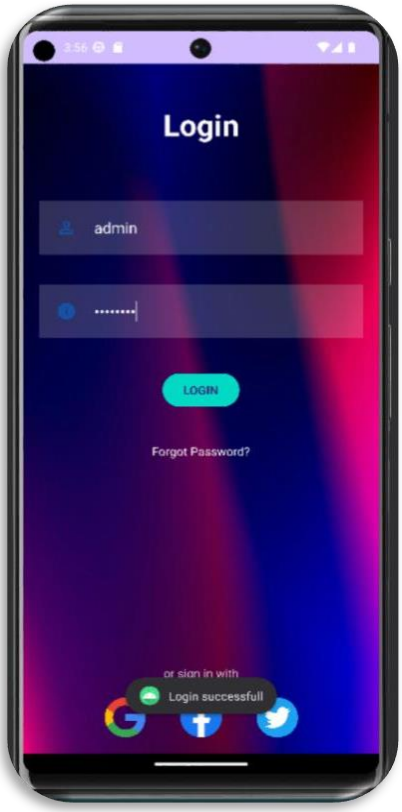
LoginInterface.java:

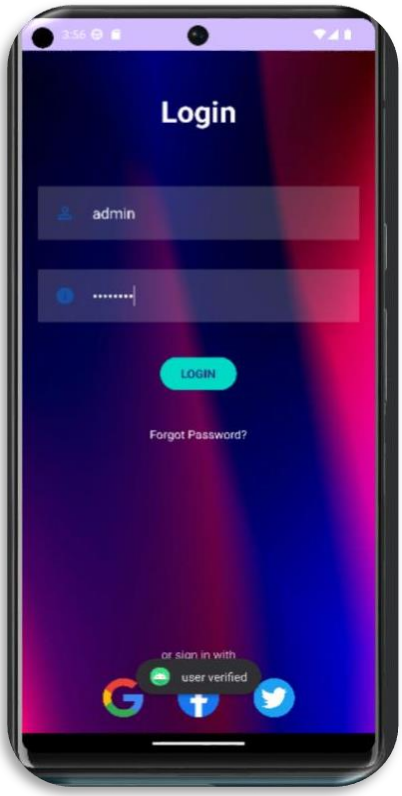
```
public class LoginModule implements LoginModuleInterface {
package com.example.myapplication;
import android.widget.Toast;
public class LoginModule implements LoginModuleInterface {
   private MainActivitymainActivity;
   public LoginModule(MainActivity activity) {
mainActivity = activity;
```

```
    }
    @Override
    public int login(String username, String password) {
        if (isValidCredentials(username, password)) {
Toast.makeText(mainActivity, "Login successfull", Toast.LENGTH_LONG).show();
        } else {
Toast.makeText(mainActivity, "Login failed", Toast.LENGTH_LONG).show();
        }
        return 0;
    }
    @Override
    public void logout() {
 Toast.makeText(mainActivity, "Logout", Toast.LENGTH_LONG).show();
    }
    private booleanisValidCredentials(String username, String password) {
        // Check if the provided username and password are valid
        return username.equals("admin") &&password.equals("password");
    }
}
```

Output:


Login
Username
password
LOGIN
Forgot Password?
or sign in with
Dynamic linking successfull


Login
admin
LOGIN
Forgot Password?
or sign in with
Login successfull


Login
admin
LOGIN
Forgot Password?
or sign in with
user verified

6. DEVELOP AN APPLICATION THAT MAKE USE OF MOBILE DATABASE

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<AbsoluteLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_x="50dp"
        android:layout_y="20dp"
        android:text="Student Details"
        android:textSize="30sp" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_x="20dp"
        android:layout_y="110dp"
        android:text="Enter Rollno:"
        android:textSize="20sp" />

    <EditText
        android:id="@+id/Rollno"
```

```
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_x="175dp"
    android:layout_y="100dp"
    android:inputType="number"
    android:textSize="20sp" />

<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="20dp"
    android:layout_y="160dp"
    android:text="Enter Name:"
    android:textSize="20sp" />

<EditText
    android:id="@+id/Name"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_x="175dp"
    android:layout_y="150dp"
    android:inputType="text"
    android:textSize="20sp" />

<TextView
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="20dp"
    android:layout_y="210dp"
    android:text="Enter Marks:"
    android:textSize="20sp" />

<EditText
    android:id="@+id/Marks"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_x="175dp"
    android:layout_y="200dp"
    android:inputType="number"
    android:textSize="20sp" />

<Button
    android:id="@+id/Insert"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_x="25dp"
    android:layout_y="300dp"
    android:text="Insert"
    android:textSize="30dp" />
```

```
<Button
    android:id="@+id/Delete"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="200dp"
    android:layout_y="300dp"
    android:text="Delete"
    android:textSize="30dp" />

<Button
    android:id="@+id/Update"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_x="25dp"
    android:layout_y="400dp"
    android:text="Update"
    android:textSize="30dp" />

<Button
    android:id="@+id/View"
    android:layout_width="150dp"
    android:layout_height="wrap_content"
    android:layout_x="200dp"
    android:layout_y="400dp"
    android:text="View"
```

```
        android:textSize="30dp" />


    <Button
        android:id="@+id/ViewAll"
        android:layout_width="200dp"
        android:layout_height="wrap_content"
        android:layout_x="100dp"
        android:layout_y="500dp"
        android:text="View All"
        android:textSize="30dp" />
</AbsoluteLayout>
```

MainActivity.java:

```
ackage com.example.exno1;
import android.app.Activity;
import android.app.AlertDialog.Builder;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.view.View.OnClickListener;
import android.widget.Button;
import android.widget.EditText;
```

```
public class MainActivity extends Activity implements OnClickListener
{
    EditText Rollno,Name,Marks;
    Button Insert,Delete,Update,View,ViewAll;
    SQLiteDatabase db;
    /** Called when the activity is first created. */
    @Override
    public void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        Rollno=(EditText)findViewById(R.id.Rollno);
        Name=(EditText)findViewById(R.id.Name);
        Marks=(EditText)findViewById(R.id.Marks);
        Insert=(Button)findViewById(R.id.Insert);
        Delete=(Button)findViewById(R.id.Delete);
        Update=(Button)findViewById(R.id.Update);
        View=(Button)findViewById(R.id.View);
        ViewAll=(Button)findViewById(R.id.ViewAll);

        Insert.setOnClickListener(this);
        Delete.setOnClickListener(this);
        Update.setOnClickListener(this);
        View.setOnClickListener(this);
```

```
        ViewAll.setOnClickListener(this);


        // Creating database and table
        db=openOrCreateDatabase("StudentDB", Context.MODE_PRIVATE,
                null);
        db.execSQL("CREATE TABLE IF NOT EXISTS student(rollno VARCHAR,name
VARCHAR,marks VARCHAR);");
    }
    public void onClick(View view)
    {
        // Inserting a record to the Student table
        if(view==Insert)
        {
            // Checking for empty fields
            if(Rollno.getText().toString().trim().length()==0||
                    Name.getText().toString().trim().length()==0||
                    Marks.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter all values");
                return;
            }
            db.execSQL("INSERT INTO student
VALUES('"+Rollno.getText()+"','"+Name.getText()+
                            "','"+Marks.getText()+"');");
            showMessage("Success", "Record added");
            clearText();
```

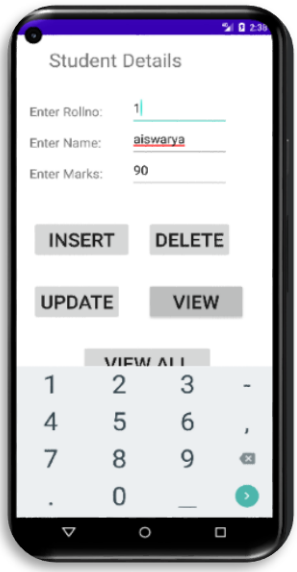
```
        }
        // Deleting a record from the Student table
        if(view==Delete)
        {
            // Checking for empty roll number
            if(Rollno.getText().toString().trim().length()==0)
            {
                showMessage("Error", "Please enter Rollno");
                return;
            }
            Cursor c=db.rawQuery("SELECT * FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
            if(c.moveToFirst())
            {
                db.execSQL("DELETE FROM student WHERE rollno='"+Rollno.getText()+"'");
                    showMessage("Success", "Record Deleted");
            }
            else
            {
                showMessage("Error", "Invalid Rollno");
            }
            clearText();
        }
        // Updating a record in the Student table
        if(view==Update)
```

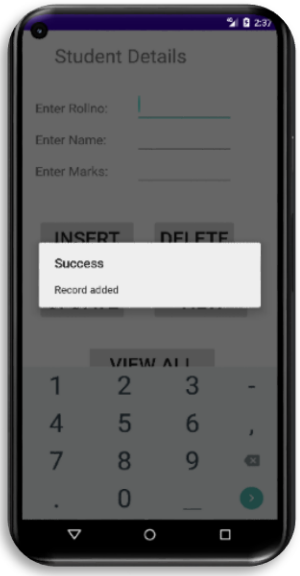
```
    {
       if(Rollno.getText().toString().trim().length()==0)
       {
          showMessage("Error", "Please enter Rollno");
          return;
       }
       Cursor c=db.rawQuery("SELECT*FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
       if(c.moveToFirst()) {
          db.execSQL("UPDATE student SET name='" + Name.getText() +
                '",marks='" + Marks.getText() +
                "' WHERE rollno='"+Rollno.getText()+"'");
          showMessage("Success", "Record Modified");
       }
       else {
          showMessage("Error", "Invalid Rollno");
       }
       clearText();
    }
          if(view==View)
    {
       if(Rollno.getText().toString().trim().length()==0)
       {
          showMessage("Error", "Please enter Rollno");
          return;
```

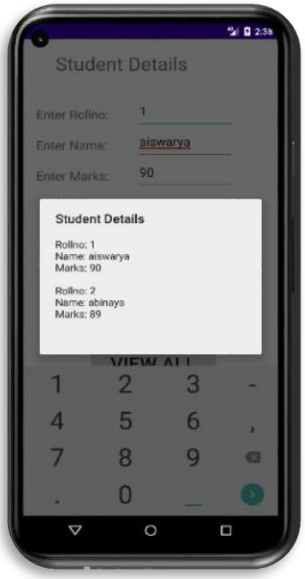
```
        }
        Cursor c=db.rawQuery("SELECT * FROM student WHERE
rollno='"+Rollno.getText()+"'", null);
        if(c.moveToFirst())
        {
            Name.setText(c.getString(1));
            Marks.setText(c.getString(2));
        }
        else
        {
            showMessage("Error", "Invalid Rollno");
            clearText();
        }
    }
    // Displaying all the records
    if(view==ViewAll)
    {
        Cursor c=db.rawQuery("SELECT * FROM student", null);
        if(c.getCount()==0)
        {
            showMessage("Error", "No records found");
            return;
        }
        StringBuffer buffer=new StringBuffer();
        while(c.moveToNext())
```

```
            {
                buffer.append("Rollno: "+c.getString(0)+"\n");
                buffer.append("Name: "+c.getString(1)+"\n");
                buffer.append("Marks: "+c.getString(2)+"\n\n");
            }
            showMessage("Student Details", buffer.toString());
        }
    }
    public void showMessage(String title,String message)
    {
        Builder builder=new Builder(this);
        builder.setCancelable(true);
        builder.setTitle(title);
        builder.setMessage(message);
        builder.show();
    }
    public void clearText()
    {
        Rollno.setText("");
        Name.setText("");
        Marks.setText("");
        Rollno.requestFocus();
    }
}
```

OUTPUT:

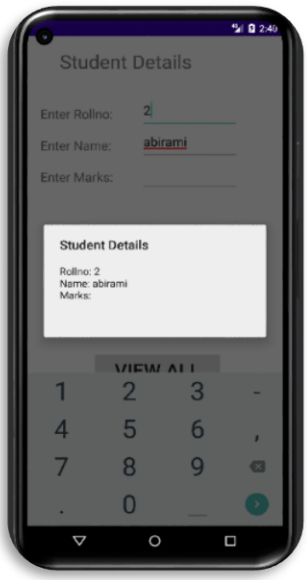

Student Details
Enter Rollno: 1
Enter Name: aiswarya
Enter Marks: 90
INSERT
DELETE
UPDATE
VIEW

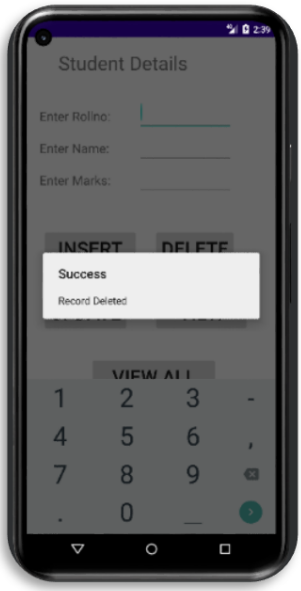

Student Details
Enter Rollno:
Enter Name:
Enter Marks:
Success
Record added


Student Details
Enter Rollno: 1
Enter Name: aiswarya
Enter Marks: 90
Student Details
Rollno: 1
Name: aiswarya
Marks: 90
Rollno: 2
Name: abinaya
Marks: 89


Student Details
Enter Rollno: 2
Enter Name: abirami
Enter Marks:
INSERT
DELETE
UPDATE
VIEW


Student Details
Enter Rollno:
Enter Name:
Enter Marks:
INSERT
DELETE
Success
Record Modified
VIEW ALL


Student Details
Enter Rollno: 2
Enter Name: abirami
Enter Marks:
Student Details
Rollno: 2
Name: abirami
Marks:
VIEW ALL


Student Details
Enter Rollno:
Enter Name:
Enter Marks:
INSERT
DELETE
Success
Record Deleted
VIEW ALL

7. IMPLEMENT AN ANDROID APPLICATION THAT WRITES DATA INTO THE SD CARD

Activity_main.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
 android:layout_width="match_parent"
 android:layout_height="match_parent"
 android:layout_margin="20dp"
 android:orientation="vertical">
<EditText
 android:id="@+id/editText"
 android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:singleLine="true"
 android:textSize="30dp" />
<Button
 android:id="@+id/button"
 android:layout_width="match_parent"
android:layout_height="wrap_content"
android:layout_margin="10dp"
android:text="Write Data"
android:textSize="30dp" />
<Button
 android:id="@+id/button2"
 android:layout_width="match_parent"
```

```
 android:layout_height="wrap_content"
 android:layout_margin="10dp"
 android:text="Read data"
 android:textSize="30dp" />
<Button
 android:id="@+id/button3"
 android:layout_width="match_parent"
 android:layout_height="wrap_content"
 android:layout_margin="10dp"
 android:text="Clear"
 android:textSize="30dp" />
</LinearLayout>
```

MainActivity.java:

```
packagecom.example.exno8;
import android.os.Bundle;
//import android.support.v7.app.AppCompatActivity;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import java.io.BufferedReader;
import java.io.File;
import java.io.FileInputStream;
import java.io.FileOutputStream;
import java.io.InputStreamReader;
```

```
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity
{
 EditText e1;
 Button write,read,clear;
 @Override
 protected void onCreate(Bundle savedInstanceState)
 {
 super.onCreate(savedInstanceState);
 setContentView(R.layout.activity_main);
 e1= (EditText) findViewById(R.id.editText);
 write= (Button) findViewById(R.id.button);
 read= (Button) findViewById(R.id.button2);
 clear= (Button) findViewById(R.id.button3);
 write.setOnClickListener(new  View.OnClickListener()
 {
 @Override
 public void onClick(View v)
 {
 String message=e1.getText().toString();
 try
 {
 File f=new File("/sdcard/myfile.txt");
 f.createNewFile();
 FileOutputStream fout=new FileOutputStream(f);
```

```
 fout.write(message.getBytes());
 fout.close();
 Toast.makeText(getBaseContext(),"Data Written in
SDCARD",Toast.LENGTH_LONG).show();
 }
 catch (Exception e)
 {
 Toast.makeText(getBaseContext(),e.getMessage(),Toast.LENGTH_LONG).show();
 }
 }
 });
 read.setOnClickListener(new  View.OnClickListener()
 {
 @Override
 public void onClick(View v)
 {
 String message;
 String buf = "";
 try
 {
 File f = new File("/sdcard/myfile.txt");
 FileInputStream fin = new FileInputStream(f);
 BufferedReader br = new BufferedReader(new InputStreamReader(fin));
while ((message = br.readLine()) != null)
 {
```

```
 buf += message;
 }
 e1.setText(buf);
 br.close();
 fin.close();
 Toast.makeText(getBaseContext(),"Data Recived from
SDCARD",Toast.LENGTH_LONG).show();
 }
 catch (Exception e)
 {
 Toast.makeText(getBaseContext(), e.getMessage(), Toast.LENGTH_LONG).show();
 }
 }
 });
 clear.setOnClickListener(new  View.OnClickListener()
 {
 @Override
 public void onClick(View v)
 {
 e1.setText("");
 }
 });
 }
}
```

AndroidManifest.xml:

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
 package="com.example.exno8" >
<uses-permission  android:name="android.permission.WRITE_EXTERNAL_STORAGE"  />
<application
 android:allowBackup="true"
 android:icon="@mipmap/ic_launcher"
 android:label="@string/app_name"
 android:supportsRtl="true"
 android:theme="@style/AppTheme" >
<activity android:name=".MainActivity" >
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
</activity>
</application>
</manifest>
```

OUTPUT:


sd
WRITE DATA
READ DATA
CLEAR
Hello!!!
Data Written in SDCARD
Data Recived from SDCARD

8. DEVELOP A WEB BASED MOBILE APPLICATION THAT ACCESSES INTERNET AND LOCATION DATA

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:tools="http://schemas.android.com/tools">
<uses-permission  android:name="android.permission.ACCESS_FINE_LOCATION"  />
<uses-permission android:name="android.permission.ACCESS_COARSE_LOCATION"/>
<application
android:allowBackup="true"
android:dataExtractionRules="@xml/data_extraction_rules"
android:fullBackupContent="@xml/backup_rules"
android:icon="@mipmap/ic_launcher"
android:label="@string/app_name"
android:supportsRtl="true"
android:theme="@style/Theme.Location"
tools:targetApi="31">
<activity
android:name=".MainActivity"
android:exported="true">
<intent-filter>
<action android:name="android.intent.action.MAIN" />
<category android:name="android.intent.category.LAUNCHER" />
</intent-filter>
```

```
</activity>
</application>
</manifest>
```

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/button_get_location"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:text="Get Location"
android:layout_centerInParent="true" />
<TextView
android:id="@+id/text_view_location"
android:layout_width="wrap_content"
android:layout_height="wrap_content"
android:layout_below="@id/button_get_location"
android:layout_centerHorizontal="true"
android:layout_marginTop="16dp" />
</RelativeLayout>
```

MainActivity.java

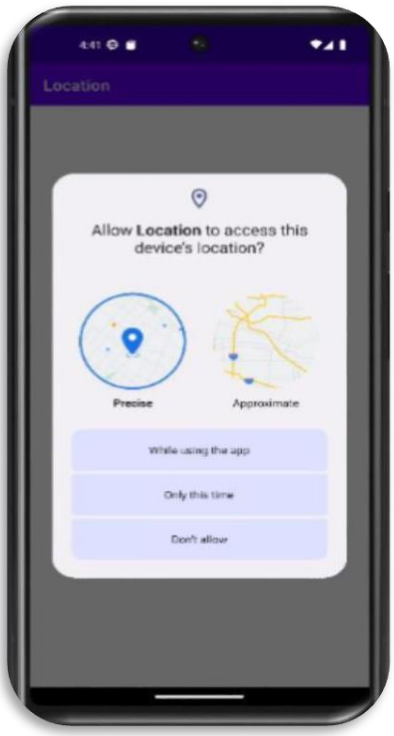
```
package com.example.location;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.Manifest;
import android.content.pm.PackageManager;
import android.location.Location;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;
import com.google.android.gms.location.FusedLocationProviderClient;
import com.google.android.gms.location.LocationServices;
import com.google.android.gms.tasks.OnSuccessListener;
public class MainActivity extends AppCompatActivity {
private static final int PERMISSION_REQUEST_CODE = 1;
private Button getLocationButton;
private TextView locationTextView;
private FusedLocationProviderClient fusedLocationClient;
@Override
protected void onCreate(Bundle savedInstanceState) {
```

```
super.onCreate(savedInstanceState);
setContentView(R.layout.activity_main);
getLocationButton = findViewById(R.id.button_get_location);
locationTextView = findViewById(R.id.text_view_location);
fusedLocationClient = LocationServices.getFusedLocationProviderClient(this);
getLocationButton.setOnClickListener(new View.OnClickListener() {
@Override
public void onClick(View v) {
if (ContextCompat.checkSelfPermission(MainActivity.this,
Manifest.permission.ACCESS_FINE_LOCATION)
== PackageManager.PERMISSION_GRANTED) {
getLocation();
} else {
ActivityCompat.requestPermissions(MainActivity.this,
new String[]{Manifest.permission.ACCESS_FINE_LOCATION},
PERMISSION_REQUEST_CODE);
}
}
});
}
private void getLocation() {
if (ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_FINE_LOCATION) !=
PackageManager.PERMISSION_GRANTED && ActivityCompat.checkSelfPermission(this,
Manifest.permission.ACCESS_COARSE_LOCATION) !=
```

```
PackageManager.PERMISSION_GRANTED) {
return;
}
fusedLocationClient.getLastLocation()
.addOnSuccessListener(this, new OnSuccessListener<Location>() {
@Override
public void onSuccess(Location location) {
if (location != null) {
double latitude = location.getLatitude();
double longitude = location.getLongitude();
String locationData = "Latitude: " + latitude + "\nLongitude: " + longitude;
locationTextView.setText(locationData);
} else {
Toast.makeText(MainActivity.this, "Location data not available",
Toast.LENGTH_SHORT).show();
}
}
});
}
@Override
public void onRequestPermissionsResult(int requestCode, @NonNull String[] permissions,
@NonNull int[] grantResults) {
super.onRequestPermissionsResult(requestCode, permissions, grantResults);
if (requestCode == PERMISSION_REQUEST_CODE) {
if (grantResults.length > 0 && grantResults[0] ==
```

```
PackageManager.PERMISSION_GRANTED) {
getLocation();
} else {
Toast.makeText(this, "Permission denied", Toast.LENGTH_SHORT).show();
}
}
}
}
```

OUTPUT:


Location
Allow Location to access this device's location?
Precise
Approximate
While using the app
Only this time
Don't allow


Location
GET LOCATION
Latitude: 37.4219983
Longitude: -122.084

9. DEVELOP AN ANDROID APPLICATION USING TELEPHONY TO SEND SMS

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/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginBottom="8dp"
        android:text="dial"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
```

```
        app:layout_constraintVertical_bias="0.38"  />
    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="8dp"
        android:layout_marginBottom="8dp"
        android:text="send sms"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/button"
        app:layout_constraintVertical_bias="0.128" />
    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="24dp"
        android:layout_marginEnd="24dp"
        android:text="Telephony to send SMS and DIAL"
        android:textColor="#B32455"
        android:textSize="24sp"
```

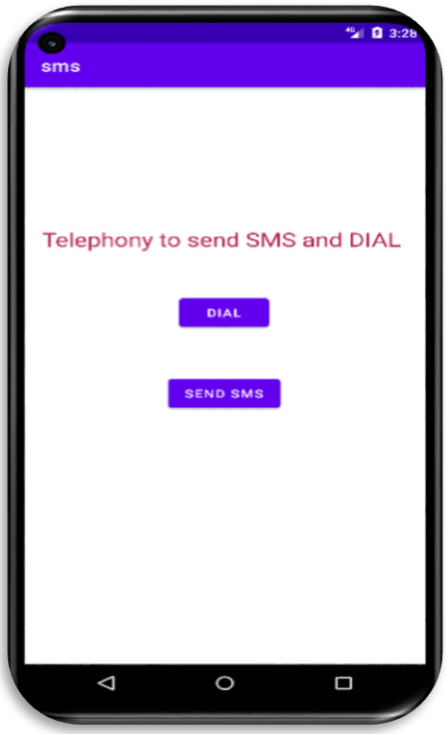
```
        app:autoSizeTextType="uniform"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="1.0"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.225" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

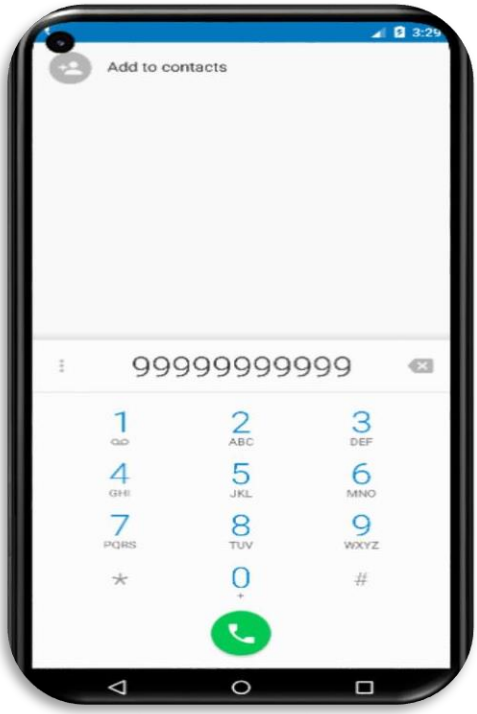
MainActivity.java:-

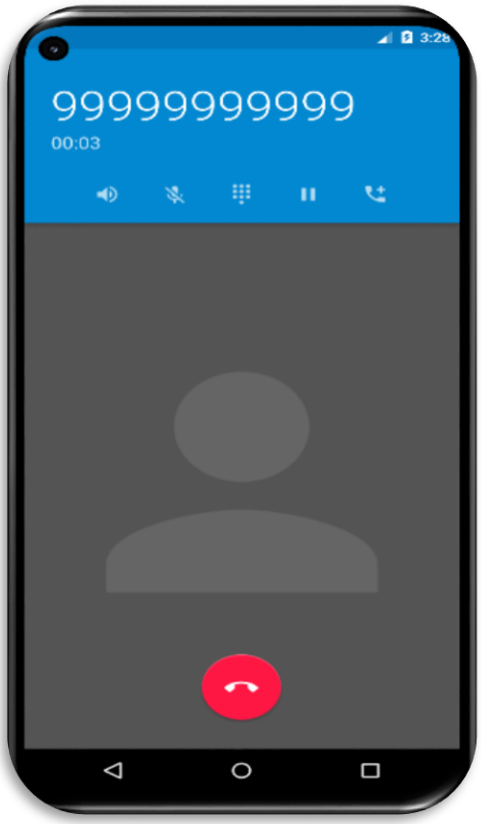
```
package com.example.sms;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.widget.Button;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    Button dial,sms;
@Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        dial= findViewById(R.id.button);
        sms = findViewById(R.id.button2);
        dial.setOnClickListener(view -> {
            Intent i = new Intent(Intent.ACTION_DIAL, Uri.parse("tel:99999999999"));
```

```
            startActivity(i);
        });
        sms.setOnClickListener(view -> {
            Intent i = new Intent(Intent.ACTION_SENDTO, Uri.parse("smsto:1234567890"));
            startActivity(i);
        });
    }
}
```

OUTPUT:


sms
Telephony to send SMS and DIAL
DIAL
SEND SMS


Add to contacts
99999999999


99999999999
00:03


1234567890
Hi hello
3:29 PM
Type message