

MAD LAB PROGRAMS

Program 1: Creating “Hello world” Application.

XML CODE:

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.438" />
    <Button
        android:id="@+id/hello"
        android:layout_width="309dp"
        android:layout_height="166dp"
        android:background="#535538"
        android:text="click Me"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.627"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.55" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

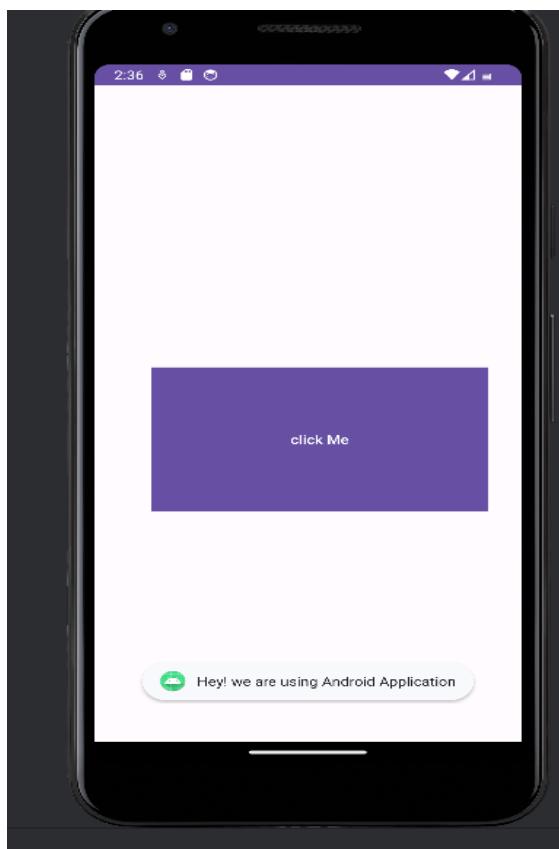
```
package com.example.myapplication1;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.Toast;
import androidx.appcompat.app.AppCompatActivity;
import androidx.activity.EdgeToEdge;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Button b;
```

```

b=findViewById(R.id.hello);
b.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Toast.makeText(MainActivity.this,"Hey! we are using Android
Application",Toast.LENGTH_SHORT).show();
    }
});
}
}

```

SNAPSHOT



Program 2: Creating an application that displays message based on the screen orientation.

XML CODE:

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"

```

```

        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.438" />
    <Button
        android:id="@+id/hello"
        android:layout_width="309dp"
        android:layout_height="166dp"
        android:background="#535538"
        android:text="click Me"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.627"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.55" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

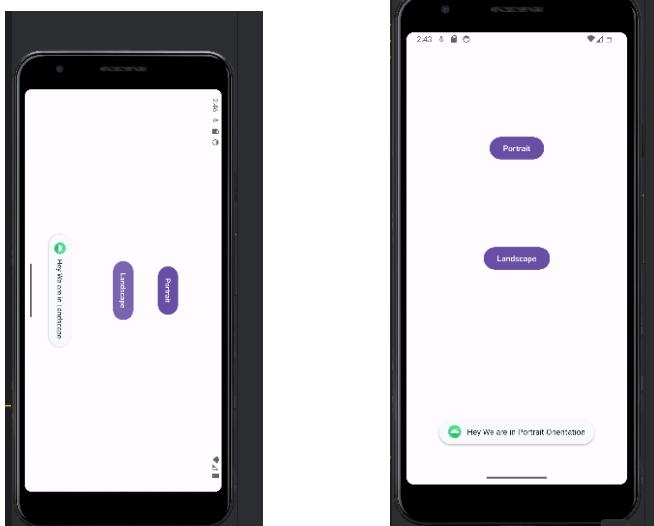
MainActivity.java

```

package com.example.myapplication3;
import android.content.pm.ActivityInfo;
import android.os.Bundle;
import android.view.View;
import android.widget.Toast;
import android.widget.Button;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        Button l,p;
        l = findViewById(R.id.button);
        p = findViewById(R.id.button2);
        l.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_LANDSCAPE);
                Toast.makeText(MainActivity.this, "Hey We are in Landscape",
Toast.LENGTH_SHORT).show();
            }
        });
        p.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
setRequestedOrientation(ActivityInfo.SCREEN_ORIENTATION_PORTRAIT);
                Toast.makeText(MainActivity.this, "Hey We are in Portrait Orientation",
Toast.LENGTH_SHORT).show();
            }
        });
    }
}
```

```
}
```

SNAPSHOTS



Program 3: Create an application to develop Login window using UI controls.

XML CODE:

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:background="@drawable/bg_outer">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:gravity="center"
        android:layout_centerInParent="true"
        android:orientation="vertical"
        android:background="@drawable/bg_inner"
        android:padding="30dp"      >
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="LOGIN PAGE"
            android:textSize="32sp"
            android:textStyle="bold"
            android:fontFamily="sans-serif-condensed-medium"
            android:textColor="@color/black"
            android:paddingBottom="20dp" />
        <EditText
            android:id="@+id/editTextUsername"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:layout_marginBottom="16dp"
            android:hint="Username"
```

```

        android:minHeight="48dp" />
<EditText
    android:id="@+id/editTextPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/editTextUsername"
    android:layout_marginBottom="16dp"
    android:hint="Password"
    android:inputType="textPassword"
    android:minHeight="48dp" />
<Button
    android:id="@+id/buttonLogin"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Login"
    android:layout_below="@+id/editTextPassword"/>
</LinearLayout>
</RelativeLayout>
```

bg_outer.xml (Inside Drawable Folder)

```

<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
    <corners android:radius="12dp" />
    <gradient
        android:startColor="#B388FF"
        android:endColor="#397C9A"
        android:angle="100"/>
</shape>
```

bg_inner.xml (Inside Drawable Folder)

```

<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
    <gradient
        android:startColor="#84FFFF"
        android:endColor="#f08"
        android:angle="100"/>
    <corners android:radius="20dp"/>
</shape>
```

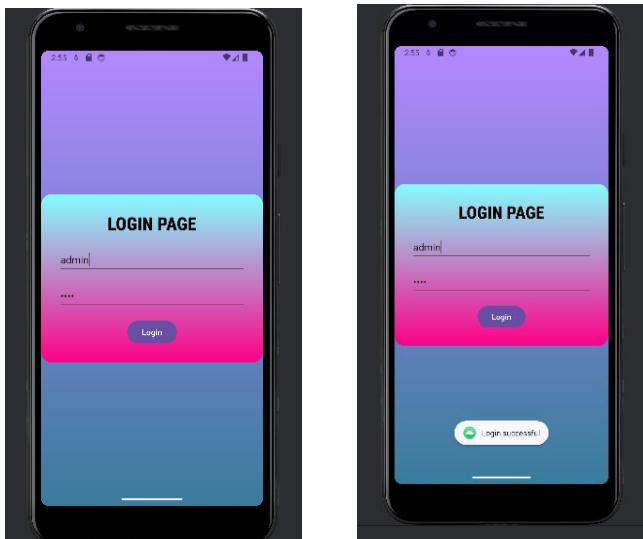
MainActivity.java

```

package com.example.myapplication4;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import com.example.myapplication4.R;
public class MainActivity extends AppCompatActivity {
    private EditText editTextUsername,editTextPassword;
    private Button buttonLogin;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
```

```
super.onCreate(savedInstanceState);
EdgeToEdge.enable(this);
setContentView(R.layout.activity_main);
editTextUsername = findViewById(R.id.editTextUsername);
editTextPassword = findViewById(R.id.editTextPassword);
buttonLogin = findViewById(R.id.buttonLogin);
buttonLogin.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        String username = editTextUsername.getText().toString().trim();
        String password = editTextPassword.getText().toString().trim();
        if(username.equals("admin") && password.equals("pass")){
            Toast.makeText(MainActivity.this, "Login successful",
                    Toast.LENGTH_SHORT).show();
        } else {
            Toast.makeText(MainActivity.this, "Invalid username or password",
                    Toast.LENGTH_SHORT).show();
        }
    }
});
```

SNAPSHOTS



Program 4: Create an application to implement new activity using explicit intent, implicit intent and content provider.

XML CODE:

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

```

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Explicit Button"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>

```

MainActivity.java:

```

package com.example.myapplication5;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
public class MainActivity extends AppCompatActivity {
    Button btnExplicitContent;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnExplicitContent=findViewById(R.id.button);
        btnExplicitContent.setOnClickListener(new View.OnClickListener() { @Override
            public void onClick(View view) {
                Intent intent = new Intent(MainActivity.this,
                    SecondActivity.class);
                startActivity(intent);
            }
        });
    }
}

```

activity_second.xml

```

<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".SecondActivity">
    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Implicit Button"

```

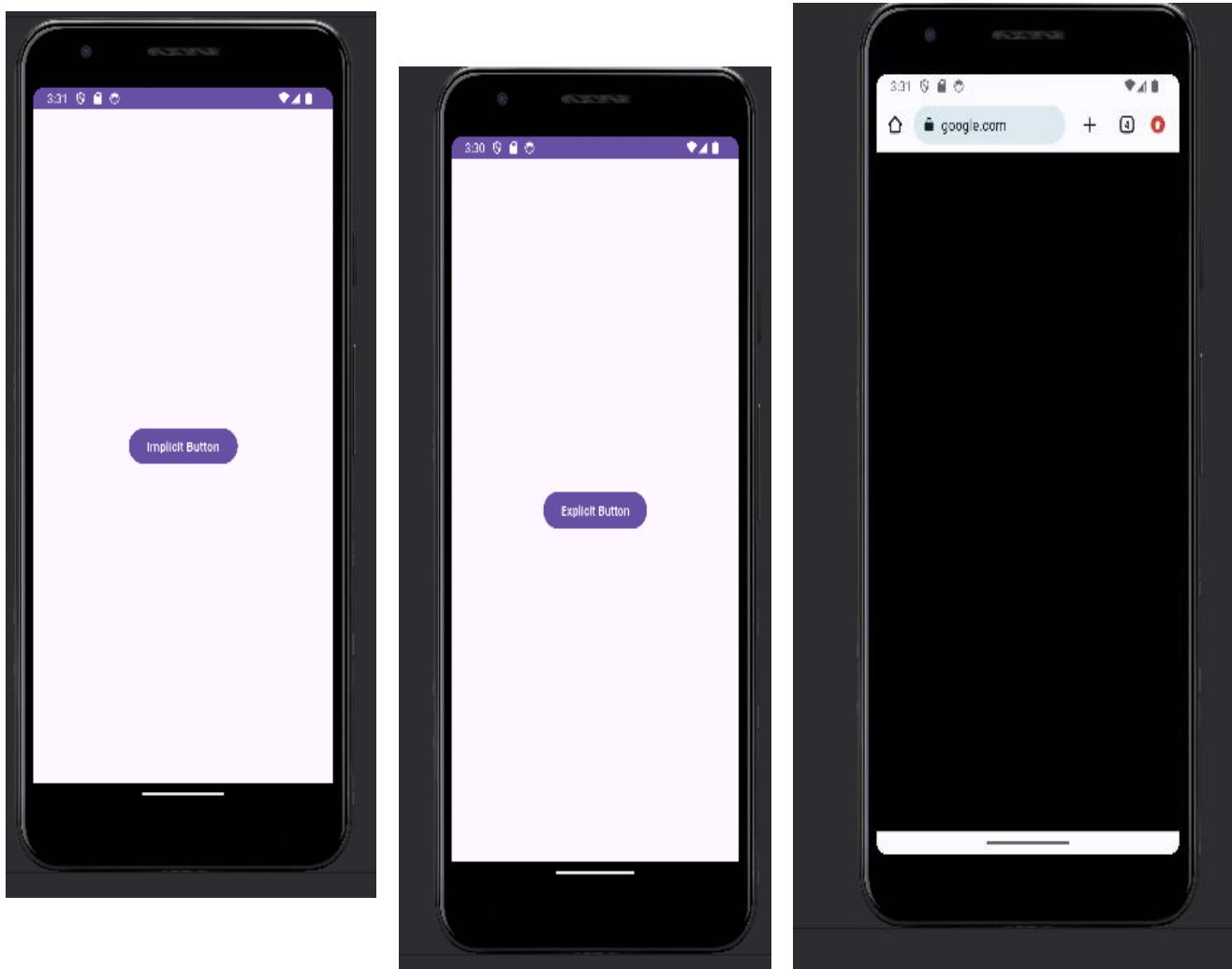
```
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

SecondActivity.java

```
package com.example.myapplication5;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;
public class SecondActivity extends AppCompatActivity {
    Button btnImplicitContent;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_second);
        btnImplicitContent = findViewById(R.id.button2);
        btnImplicitContent.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Uri webpage = Uri.parse("https://www.google.com");
                Intent intent = new Intent(Intent.ACTION_VIEW, webpage);
                startActivity(intent);
            }
        });
    }
}
```

SNAPSHOT



Program 5: Create an application that displays custom designed Opening Screen.

XML CODE:

```
<?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:id="@+id/idRLContainer"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:background="@drawable/back_drawable">
    <TextView
        android:id="@+id/idTVHeading"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_centerInParent="true"
        android:layout_margin="20dp"
        android:gravity="center"
        android:padding="10dp"
        android:text="Welcome to My App"
        android:textAlignment="center"
        android:textColor="@color/white"
```

```
        android:textSize="24sp"
        android:textStyle="bold" />
</RelativeLayout>
```

MainActivity.java

```
package com.example.a4thprogram;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import android.widget.RelativeLayout;
import com.example.a4thprogram.R;
public class MainActivity extends AppCompatActivity {
    private RelativeLayout containerRL;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        // Initialize the RelativeLayout container
        containerRL = findViewById(R.id.idRLContainer);
        // Set background for the RelativeLayout using the drawable resource
        containerRL.setBackground(getResources().getDrawable(R.drawable.back_drawable));
    }
}
```

back_drawable: (Inside Drawable Folder)

```
<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android"
    android:shape="rectangle">
    <!-- on below line we are adding gradient and specifying start and end color with angle -->
    <gradient
        android:angle="270"
        android:endColor="@color/white"
        android:startColor="#0F9D58" />
</shape>
```

SNAPSHOT:



Program 6: Create an UI with all views

```
package com.example.all_views;
import android.annotation.SuppressLint;
import android.content.Context;
import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
```

```

import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.Spinner;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AlertDialog;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity {
    Button sub;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        Button sub = findViewById(R.id.submit);
        sub.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                showMessage(MainActivity.this, "User Information", "Successfully Completed");
            }
        });
        String[] item = new String[]{"India", "Pakistan", "China", "America", "England"};
        ArrayAdapter<String> adapter = new ArrayAdapter<>(this,
        android.R.layout.simple_spinner_item, item);
        adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_item);
        @SuppressLint("WrongViewCast") Spinner spinner = findViewById(R.id.country);
        spinner.setAdapter(adapter);
    }
    public void showMessage(Context con, String t, String msg) {
        AlertDialog.Builder builder = new AlertDialog.Builder(con);
        builder.setTitle(t);
        builder.setMessage(msg);
        builder.setPositiveButton("OK", new DialogInterface.OnClickListener() {
            @Override
            public void onClick(DialogInterface dialog, int which) {
                dialog.dismiss();
            }
        });
        builder.show();
    }
}

```

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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:gravity="center"
    android:orientation="vertical"
    android:padding="30dp"
    android:background="@drawable/bg_outer">

```

```
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="User Information!"
    android:textSize="30sp"
    android:textStyle="bold"
    android:textColor="#26369C" />
<ImageView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:src="@drawable/img1" />
<ToggleButton
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textOn="Active"
    android:textOff="Inactive"/>
<View
    android:layout_width="match_parent"
    android:layout_height="40dp"/>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:paddingTop="30dp"
    android:paddingBottom="30dp"
    android:paddingLeft="5dp"
    android:paddingRight="5dp"
    android:orientation="vertical"
    android:background="@drawable/bg_inner">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:padding="5dp">
            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:text="NAME"
                android:textSize="20sp"
                android:textStyle="bold"
                android:textColor="#26389C"
                android:padding="15dp"/>
            <EditText
                android:layout_width="match_parent"
                android:layout_height="60dp"
                android:id="@+id/name"
                android:background="@drawable/bg"
                android:padding="15dp"/>
        </LinearLayout>
    </LinearLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:orientation="horizontal"
        android:padding="5dp">
            <TextView
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="E-mail"
    android:textSize="20sp"
    android:textStyle="bold"
    android:textColor="#26389C"
    android:padding="15dp"/>
<EditText
    android:layout_width="match_parent"
    android:layout_height="60dp"
    android:id="@+id/email"
    android:ems="10"
    android:inputType="textEmailAddress"
    android:background="@drawable/bg"
    android:padding="15dp"/>
</LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:padding="5dp">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Gender"
        android:textSize="20sp"
        android:textStyle="bold"
        android:textColor="#26389C"
        android:padding="15dp"
        android:paddingEnd="40dp"/>
    <RadioGroup
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:background="@drawable/bg"
        android:orientation="horizontal"
        android:id="@+id/gender">
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/male"
            android:padding="15dp"
            android:text="Male"
            android:textColor="#26389C"
            android:textSize="20sp"
            android:textStyle="bold"/>
        <RadioButton
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:id="@+id/female"
            android:padding="15dp"
            android:text="Female"
            android:textColor="#26389C"
            android:textSize="20sp"
            android:textStyle="bold"/>
    </RadioGroup>
</LinearLayout>
```

```

    </LinearLayout>
<LinearLayout
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:padding="5dp">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Country"
        android:textSize="20sp"
        android:textStyle="bold"
        android:textColor="#26389C"
        android:padding="15dp"
        android:paddingEnd="5dp"/>
    <Spinner
        android:id="@+id/country"
        android:layout_width="match_parent"
        android:layout_height="60dp"
        android:padding="15dp"
        android:background="@drawable/bg"/>
</LinearLayout>
</LinearLayout>
<View
    android:layout_width="match_parent"
    android:layout_height="40dp"/>
<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:id="@+id/submit"
    android:padding="15dp"
    android:background="@drawable/bg"
    android:text="Submit"
    android:textColor="#26389C"
    android:textSize="20sp"
    android:textStyle="bold"/>
</LinearLayout>

```

BG.XML

```

<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
<solid android:color="#2860F367"/>
    <corners android:radius="30dp"/>
    <stroke android:color="#00BFA5"
        android:width="2dp"/>
</shape>

```

BG_INNER.XML

```

<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
<gradient android:startColor="#64F194"
    android:endColor="#B242C5"
    android:angle="120"/>
    <corners android:radius="20dp"

```

```
    android:topLeftRadius="70dp"
    android:bottomLeftRadius="70dp"/>
</shape>
```

BG_OUTER.XML

```
<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
<gradient android:startColor="#64F194"
    android:endColor="#B242C5"
    android:angle="120"/>
<corners android:radius="20dp"
    android:topLeftRadius="70dp"
    android:bottomLeftRadius="70dp"/>
</shape>
```

Snapshots:

Program 7: Create menu in Application

Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language as Java**, and Select the

Minimum SDK as API 16 (“Jelly Bean”, Android 4.1). Click **Finish** Button.

To create another activity for **Home Page**, Right Click **App**→**New**→**Activity**→ **Empty Views Activity**. A **New Android Activity** dialog box appears, Specify the**Name** of the activity as **HomeScreen** then click **Finish**.

To create a Menu Resource File:

Right-click on the **res** directory in your Android project, navigate to **New > Android Resource File**, and **name** the file **menus.xml**, Root element as **Menu** and update the following content.

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

The menu design is as follows:



Update the following code in **MainActivity.java**

```
package com.example.menuexample;import  
android.content.Intent;  
import android.os.Bundle; import  
android.view.Menu;  
import android.view.MenuInflater;import  
android.view.MenuItem; import  
android.widget.Toast;  
import androidx.activity.EdgeToEdge;import  
androidx.annotation.NonNull;  
import androidx.appcompat.app.AppCompatActivity;import  
androidx.core.graphics.Insets;  
import androidx.core.view.ViewCompat;  
import androidx.core.view.WindowInsetsCompat; public class  
  
MainActivity extends AppCompatActivity {  
  
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState); EdgeToEdge.enable(this);  
        setContentView(R.layout.activity_main);  
    }  
    @Override  
    public boolean onCreateOptionsMenu(int featureId, @NonNull Menu menu) { MenuInflater  
        inflater=getMenuInflater(); inflater.inflate(R.menu.menus,menu);  
        return true;  
    }  
    @Override  
    public boolean onOptionsItemSelected(@NonNull MenuItem item) {  
        if(item.getItemId()==R.id.php) {  
            Toast.makeText(this, "Php Page", Toast.LENGTH_SHORT).show();  
        }  
    }  
}
```

```

if(item.getItemId()==R.id.java) {
    Toast.makeText(this, "Java Page", Toast.LENGTH_SHORT).show();
}
if(item.getItemId()==R.id.csharp) {
    Toast.makeText(this, "C# Page", Toast.LENGTH_SHORT).show();
}
return super.onOptionsItemSelected(item);
}

```

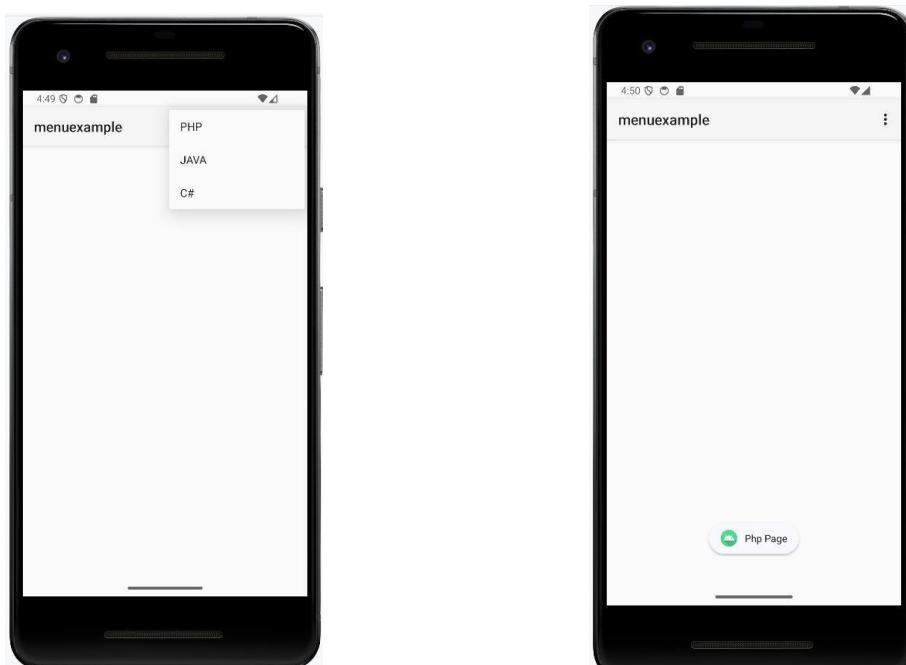
Set the **Uses-Permission** in **AndroidManifest.xml**

```

<?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.INTERNET" />
    <application android:allowBackup="true"
        android:dataExtractionRules="@xml/data_extraction_rules"
        android:fullBackupContent="@xml/backup_rules"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/Theme.AppCompat.Light"
        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>

```

Output



Program 8: Read/ write the Local data.

activity_main.xml

```
<?xml version="1.0" encoding="utf8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/resauto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity"
    android:orientation="vertical">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="User Name"></TextView>

    <EditText
        android:id="@+id/etUserName"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        ></EditText>

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Password"></TextView>

    <EditText
        android:id="@+id/etPassword"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        ></EditText>

    <Button
        android:id="@+id/btnsave"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Save" />

    <Button
        android:id="@+id/btnnext"
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Next" />

</LinearLayout>
```

MainActivity.java

```
package com.bca.locldata;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.Intent;
import android.content.SharedPreferences;
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 {

    Button btnsave,btnnext;
    EditText etUserName,etPassword;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnsave=(Button) findViewById(R.id.btnsave);
        btnnext = (Button) findViewById(R.id.btnnext);
        etUserName = (EditText) findViewById(R.id.etUserName);
        etPassword = (EditText) findViewById(R.id.etPassword);
        btnsave.setOnClickListener(new View.OnClickListener() { @Override
            public void onClick(View view) {
                // Writing data to SharedPreferences
                SharedPreferences sharedPreferences = getSharedPreferences("MyPrefs",
                Context.MODE_PRIVATE);
                SharedPreferences.Editor editor = sharedPreferences.edit();
                editor.putString("username",
                        etUserName.getText().toString());
                editor.putString("password",
                        etPassword.getText().toString());
                editor.commit();
            }
        });
    }
}
```

```
        etPassword.getText().toString());
        editor.apply();
        Toast.makeText(getApplicationContext(),"Saved
successfully",Toast.LENGTH_LONG).show();
    }
});

btnnext.setOnClickListener(new View.OnClickListener() { @Override
public void onClick(View view) {
    Intent intent = new
    Intent(getApplicationContext(),MainActivity2.class);
    startActivity(intent);
}
});
}
}
```

activity_main2.xml

```
<?xml version="1.0" encoding="utf8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/resauto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity2"
    android:orientation="vertical">

    <Button android:id="@+id	btnFetch"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Fetch" />

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="User Name"></TextView>

    <EditText
        android:id="@+id/etUserName"
        android:layout_width="match_parent"
```

```
    android:layout_height="wrap_content"
    ></EditText>
<TextView
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Password"></TextView>
<EditText
    android:id="@+id/etPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    ></EditText>
</LinearLayout>
```

MainActivity2.java

```
package com.bca.lokaldata;
import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity2 extends AppCompatActivity {
    Button btnFetch;
    EditText etUserName,etPassword;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
        btnFetch = (Button) findViewById(R.id.btnFetch);
        etUserName = (EditText)findViewById(R.id.etUserName);
        etPassword = (EditText)findViewById(R.id.etPassword);
        btnFetch.setOnClickListener(new View.OnClickListener()
        {
            @Override
            public void onClick(View view)
            {
```

```

// Reading data from SharedPreferences

SharedPreferences sharedPreferences = getSharedPreferences("MyPrefs",
Context.MODE_PRIVATE);

String username = sharedPreferences.getString("username", "");
String password = sharedPreferences.getString("password", "");

etUserName.setText(username);
etPassword.setText(password);

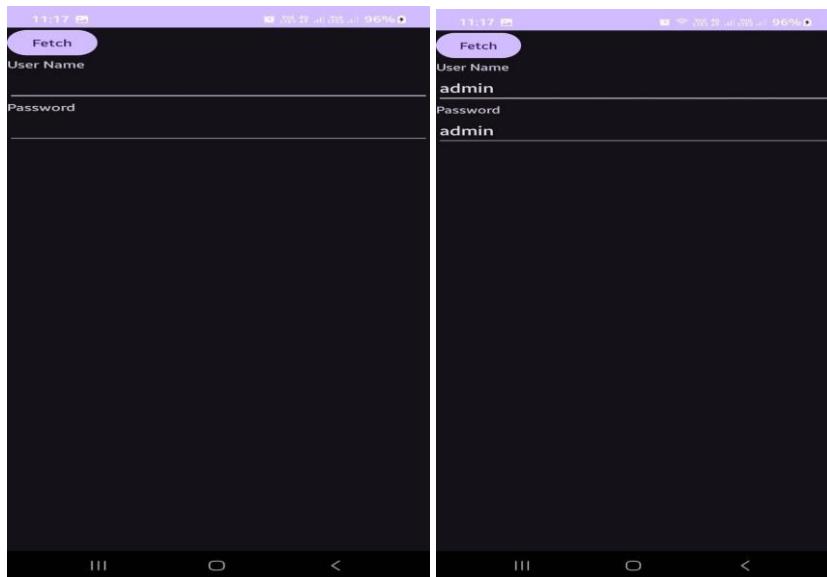
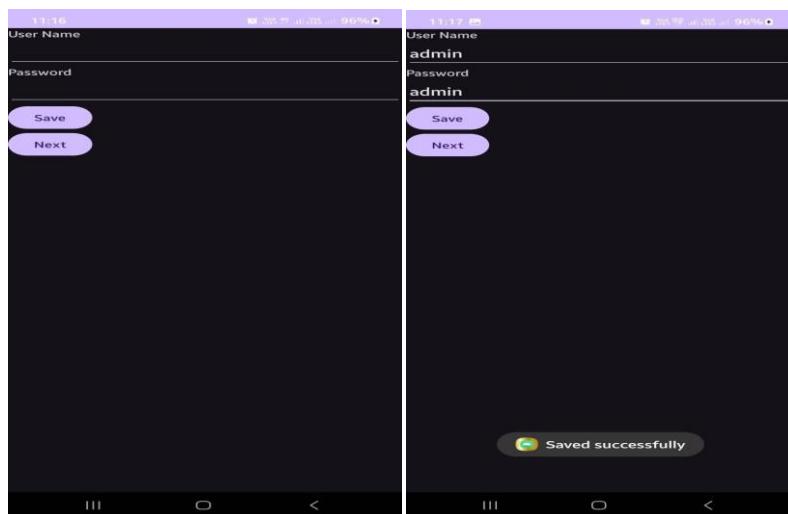
}
});

}

}


```

Output



Program 9: Create / Read / Write data with database (SQLite).

Steps:

Click **Start - Android Studio**, a **Welcome to Android Studio** dialog box will appear. Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language as Java**, and Select the **SDK as API 24("Nougat",Android 7.0)**.Click **Finish** Button.

Update the following code in **activity_main.xml**, **activity_view.xml**, **MainActivity.java** and **ViewActivity.java**

Create a class file **right click app- new- java class name it as student and update** the following code in **student.java**

To Create another activity **right click on app – new activity-Empty views Activity.**

Update the following code in **activity_edit.xml** and **EditActivity.java**.

Click Run App or Shift+F10 to execute the application.

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"
    android:orientation="vertical" android:gravity="center"
    tools:context=".MainActivity">
```

```
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="vertical" android:gravity="center">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" android:text="Course
        Registation" android:textColor="@color/colorAccent"
        android:textSize="30dp"
    />
```

```
</LinearLayout>

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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" android:text="Name"
    />

    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1" android:ems="10"
        android:id="@+id/name"
        android:textAlignment="center"
    />

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

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Course"
        />

        <EditText
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1" android:ems="10"
            android:id="@+id/course"
            android:textAlignment="center"
        />
    
```

```
</LinearLayout>

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

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" android:text="Fee"
    />

    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1" android:ems="10"
        android:id="@+id/fee"
        android:textAlignment="center"
    />

    </LinearLayout>

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

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_weight="1" android:id="@+id/bt1"
            android:text="Ok"
            android:background="@color/colorPrimary"
        />

        <Button
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
```

```
    android:layout_weight="1" android:id="@+id/bt2"
    android:text="View"
    android:background="@color/colorAccent"
/>
</LinearLayout>
</LinearLayout>
```

MainActivity.java

```
package com.bca.sqlite;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.Intent;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteStatement
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,ed3;
```

```
    Button b1,b2;
```

```
    @Override
```

```
        protected void onCreate(Bundle savedInstanceState)
```

```
        {super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_main);
```

```
        ed1 = findViewById(R.id.name);
```

```
        ed2 = findViewById(R.id.course);
```

```
        ed3 = findViewById(R.id.fee);
```

```
        b1 = findViewById(R.id.bt1);
```

```
        b2 = findViewById(R.id.bt2);
```

```
        b2.setOnClickListener(new View.OnClickListener()
```

```
        {@Override
```

```
public void onClick(View v)
{
Intent i = new Intent(getApplicationContext(),ViewActivity.class);
startActivity(i);

}
});

b1.setOnClickListener(new View.OnClickListener() {@Override

public void onClick(View v) {

insert();

}

});

}

public void insert()
{
try
{
String name = ed1.getText().toString();

String course = ed2.getText().toString();

String fee = ed3.getText().toString();

SQLiteDatabase db = openOrCreateDatabase("SliteDb",
Context.MODE_PRIVATE, null);

db.execSQL("CREATE TABLE IF NOT EXISTS records(id INTEGER
PRIMARY KEY AUTOINCREMENT,name VARCHAR,course
VARCHAR,fee VARCHAR)");

String sql = "insert into records(name,course,fee)values('" +name + "','" +
course + "','" + fee + "')";

SQLiteStatement statement = db.compileStatement(sql);

statement.execute();

Toast.makeText(this,"Record addded",Toast.LENGTH_LONG).show();

ed1.setText("");
}
```

```
ed2.setText("");
ed3.setText("");

ed1.requestFocus();

}

catch (Exception ex)
{
Toast.makeText(this,"Record Fail",Toast.LENGTH_LONG).show();
}

}

}

/* Add Student.class file (Right click on package name */


```

Student.class

```
package com.bca.sqlite;
```

```
public class Student {
```

```
    String id;
```

```
    String name;
```

```
    String course;
```

```
    String fee;
```

```
    String titles;
```

```
}
```

activity_view.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=".ViewActivity"
    android:orientation="vertical">

    <ListView
```

```
    android:layout_width="match_parent"
    android:layout_height="match_parent" android:id="@+id/lst1"
/>
</LinearLayout>
```

ViewActivity.java

```
package com.bca.sqlite;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.Intent;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import java.util.ArrayList;
public class ViewActivity extends AppCompatActivity {

    ListView lst1;

    ArrayList<String> titles = new ArrayList<String>();
    ArrayAdapter arrayAdapter;

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

        SQLiteDatabase db = openOrCreateDatabase("SliteDb", Context.MODE_PRIVATE,null);
        lst1 = findViewById(R.id.lst1);
        final Cursor c = db.rawQuery("select * from records",null);

        int id = c.getColumnIndex("id");
```

```
int name = c.getColumnIndex("name");

int course = c.getColumnIndex("course");

int fee = c.getColumnIndex("fee");

titles.clear();

arrayAdapter = new ArrayAdapter(this,
        androidx.appcompat.R.layout.support_simple_spinner_dropdown_item,titles);

lst1.setAdapter(arrayAdapter);

final ArrayList<Student> stud = new ArrayList<Student>();

if(c.moveToFirst())
{
    do {
        Student stu = new Student();

        stu.id = c.getString(id);

        stu.name = c.getString(name);

        stu.course = c.getString(course)

        ;stu.fee = c.getString(fee);

        stud.add(stu);

        titles.add(c.getString(id) + " \t " + c.getString(name) + "

\t " + c.getString(course) + " \t " + c.getString(fee) );

    } while(c.moveToNext());

    arrayAdapter.notifyDataSetChanged();

    lst1.invalidateViews();

}

lst1.setOnItemClickListener(new AdapterView.OnItemClickListener()
{@Override
public void onItemClick(AdapterView parent, View view, int position, long id) {

String aa = titles.get(position).toString();

Student stu = stud.get(position);

```

Intent i = new

```
Intent(getApplicationContext(),EditActivity.class);
i.putExtra("id",stu.id);

i.putExtra("name",stu.name);
i.putExtra("course",stu.course);

i.putExtra("fee",stu.fee);
startActivity(i);
}

});

}
}
```

activity_edit.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=".EditActivity" android:orientation="vertical">

    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:orientation="vertical"
        android:gravity="center">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Course Registration"
            android:textColor="@color/colorAccent"
            android:textSize="30dp"
            />

    </LinearLayout>
    <LinearLayout
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
    android:orientation="horizontal" android:gravity="center">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="ID"
    />
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1" android:ems="10"
        android:id="@+id/id"
        android:textAlignment="center"
    />
</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal" android:gravity="center">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Name"
    />
    <EditText
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_weight="1" android:ems="10"
        android:id="@+id/name"
        android:textAlignment="center"
    />
</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal" android:gravity="center">
    <TextView
```

```
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Course"/>
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_weight="1" android:ems="10"
    android:id="@+id/course"
    android:textAlignment="center"
/>
</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal"
    android:gravity="center">
<TextView
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Fee"
/>
<EditText
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_weight="1"
    android:ems="10"
    android:id="@+id/fee"
    android:textAlignment="center"
/>
</LinearLayout>
<LinearLayout
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:orientation="horizontal" android:gravity="center">
<Button
    android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:layout_weight="1" android:id="@+id/bt1"
    android:text="Edit"

    android:background="@color/colorPrimary"
  />

<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_weight="1" android:id="@+id/bt2"
    android:text="Delete"
    android:background="@color/colorAccent"
  />

<Button
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_weight="1" android:id="@+id/bt3"
    android:text="Back"
    android:background="@color/colorPrimaryDark"
  />

</LinearLayout>
</LinearLayout>
```

EditActivity.java

```
package com.bca.sqlite;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Context;
import android.content.Intent;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteStatement;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText; import android.widget.Toast;

public class EditActivity extends AppCompatActivity {

    EditText ed1,ed2,ed3,ed4;
```

```
Button b1,b2,b3; @Override
protected void onCreate(Bundle savedInstanceState) {
super.onCreate(savedInstanceState); setContentView(R.layout.activity_edit);
ed1 = findViewById(R.id.name);
ed2 = findViewById(R.id.course);
ed3 = findViewById(R.id.fee);
ed4 = findViewById(R.id.id);
b1 = findViewById(R.id.bt1);
b2 = findViewById(R.id.bt2);
b3 = findViewById(R.id.bt3);
Intent i = getIntent();
String t1 = i.getStringExtra("id").toString();
String t2 = i.getStringExtra("name").toString();
String t3 = i.getStringExtra("course").toString();
String t4 = i.getStringExtra("fee").toString(); ed4.setText(t1);
ed1.setText(t2); ed2.setText(t3); ed3.setText(t4);
b2.setOnClickListener(new View.OnClickListener()
{@Override
public void onClick(View v) { try
{
String id = ed4.getText().toString(); SQLiteDatabase db =
openOrCreateDatabase("SliteDb",Context.MODE_PRIVATE,null);
String sql = "delete from records where id = " + id + "";
SQLiteDatabase statement = db.compileStatement(sql);
statement.execute();
Toast.makeText(EditActivity.this,"RecordDeleted",Toast.LENGTH_LONG).show();
ed1.setText("");
ed2.setText("");
ed3.setText("");
ed1.requestFocus();
}
}}}
```

```
}

catch (Exception ex)

{
    Toast.makeText(EditActivity.this,"Record Fail",Toast.LENGTH_LONG).show();
}
}
})
};

b3.setOnClickListener(new View.OnClickListener() {@Override

public void onClick(View v) {

Intent i = new Intent(getApplicationContext(),ViewActivity.class);

startActivity(i);

}

});

b1.setOnClickListener(new View.OnClickListener() {@Override

public void onClick(View v) {

try {

String name = ed1.getText().toString();

String course = ed2.getText().toString();

String fee = ed3.getText().toString();

String id = ed4.getText().toString();

SQLiteDatabase db = openOrCreateDatabase("SliteDb",Context.MODE_PRIVATE,null);

String sql = "update records set name = '" + name + "',course='" + course +
"',fee='" + fee + " where id= " + id + "'";

SQLiteDatabase statement = db.compileStatement(sql);

statement.execute();

Toast.makeText(EditActivity.this, "Record Updated",
```

```

Toast.LENGTH_LONG).show();

ed1.setText("");
ed2.setText("");
ed3.setText("");

ed1.requestFocus();

} catch (Exception ex) {

Toast.makeText(EditActivity.this, "Record Fail",
Toast.LENGTH_LONG).show();

}

}

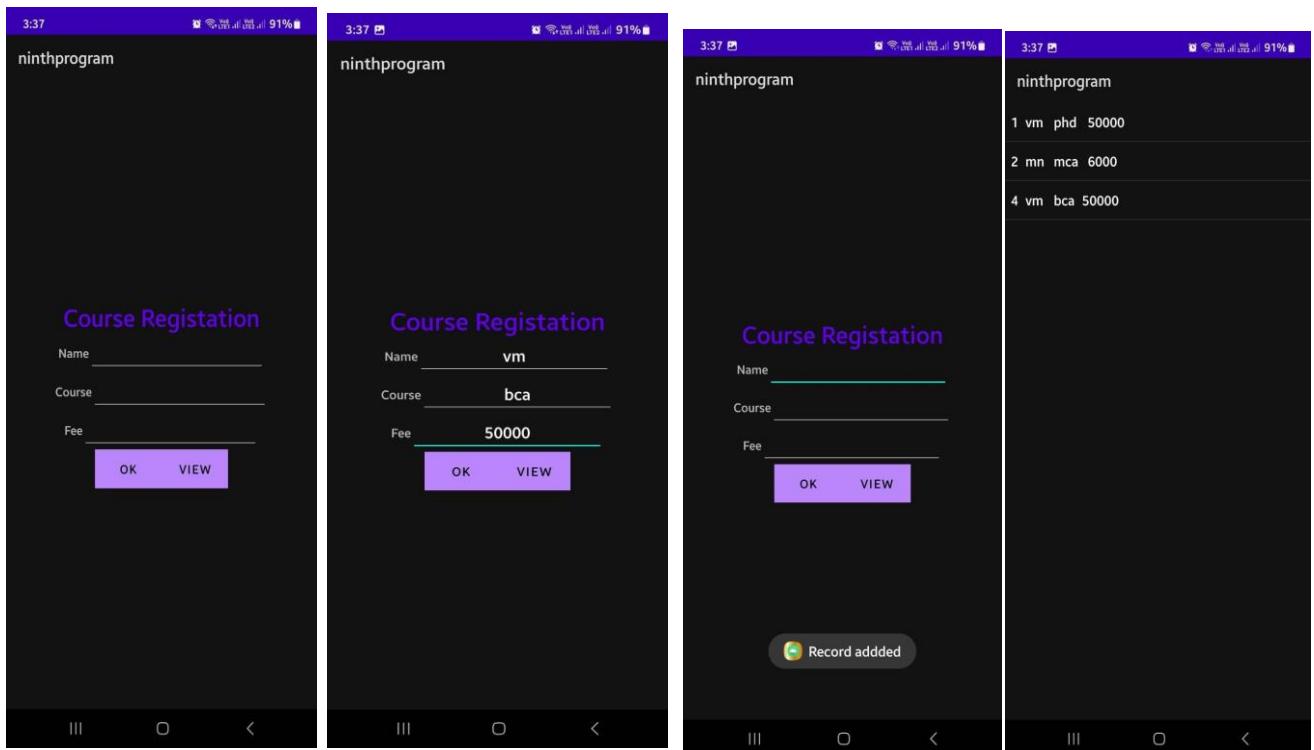
});

}

}

```

Output



Program 10: Create an application to send SMS and receive SMS

Steps:

Click **Start**- Android Studio, a **Welcome to Android Studio** dialog box will appear.

Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language** as **Java**, and Select the **SDK as API 24("Nougat",Android 7.0)**.Click **Finish** Button.

Update the following code **in activity_main.xml and MainActivity.java**

Click **Run app** or **shift+F10** to execute the application.

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:background="@color/white" tools:context=".MainActivity">
    <EditText
        android:id="@+id/editTextPhoneNumber"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter phone number"
        android:layout_margin="16dp"/>
    <EditText
        android:id="@+id/editTextMessage"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter message"
        android:layout_below="@+id/editTextPhoneNumber"
        android:layout_margin="16dp"/>
    <Button
        android:id="@+id/buttonSend"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Send"
        android:layout_below="@+id/editTextMessage"
        android:layout_alignParentEnd="true"
```

```
    android:layout_marginEnd="16dp"
    android:onClick="sendMessage" tools:ignore="UsingOnClickInXml" />
<TextView
    android:id="@+id/textViewReceivedMessages"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_below="@+id/buttonSend"
    android:layout_marginStart="16dp"
    android:layout_marginTop="16dp"
    android:layout_marginEnd="16dp"
    android:layout_marginBottom="16dp"
    android:textColor="@color/black" />
</RelativeLayout>
```

MainActivity.java

```
package com.bca.sms;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;
import android.content.BroadcastReceiver;
import android.content.Context;
import android.content.Intent;
import android.content.IntentFilter;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.telephony.SmsMessage;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;
import android.Manifest;
import androidx.appcompat.app.AppCompatActivity;
public class MainActivity extends AppCompatActivity
{
```

```
private static final int SMS_PERMISSION_CODE = 101;
private EditText editTextPhoneNumber;

private EditText editTextMessage;
private TextView textViewReceivedMessages;

@Override
protected void onCreate(Bundle savedInstanceState)
{
    super.onCreate(savedInstanceState);
    setContentView(R.layout.activity_main);
    editTextPhoneNumber = findViewById(R.id.editTextPhoneNumber);
    editTextMessage = findViewById(R.id.editTextMessage);
    textViewReceivedMessages = findViewById(R.id.textViewReceivedMessages);

    // Request SMS permissions if not granted
    if (!checkSMSPermission())
    {
        requestSMSPermission();
    }

    // Register SMS receiver
    IntentFilter intentFilter = new IntentFilter();
    intentFilter.addAction("android.provider.Telephony.SMS_RECEIVED");
    registerReceiver(smsReceiver, intentFilter);
}

@Override
protected void onDestroy()
{
    super.onDestroy();
    unregisterReceiver(smsReceiver);
}

// Button click listener for sending SMS
public void sendMessage(View view) { String phoneNumber =
    editTextPhoneNumber.getText().toString().trim();
    String message = editTextMessage.getText().toString();
    if (phoneNumber.isEmpty())
```

```

    {
        Toast.makeText(this, "Please enter a valid phone number",
        Toast.LENGTH_SHORT).show();

        return;
    }

    try {
        SmsManager smsManager = SmsManager.getDefault();
        smsManager.sendTextMessage(phoneNumber, null, message, null, null);
        Toast.makeText(this, "Message sent", Toast.LENGTH_SHORT).show();
    }

    catch (IllegalArgumentException e)
    {
        Toast.makeText(this, "Invalid phone number format",
        Toast.LENGTH_SHORT).show();
    }

    } catch (Exception e) {
        Toast.makeText(this, "Failed to send message", Toast.LENGTH_SHORT).show();
        e.printStackTrace();
    }

}

// Check if SMS permission is granted
private boolean checkSMSPermission() {
    return ContextCompat.checkSelfPermission(this, Manifest.permission.SEND_SMS) ==
PackageManager.PERMISSION_GRANTED;
}

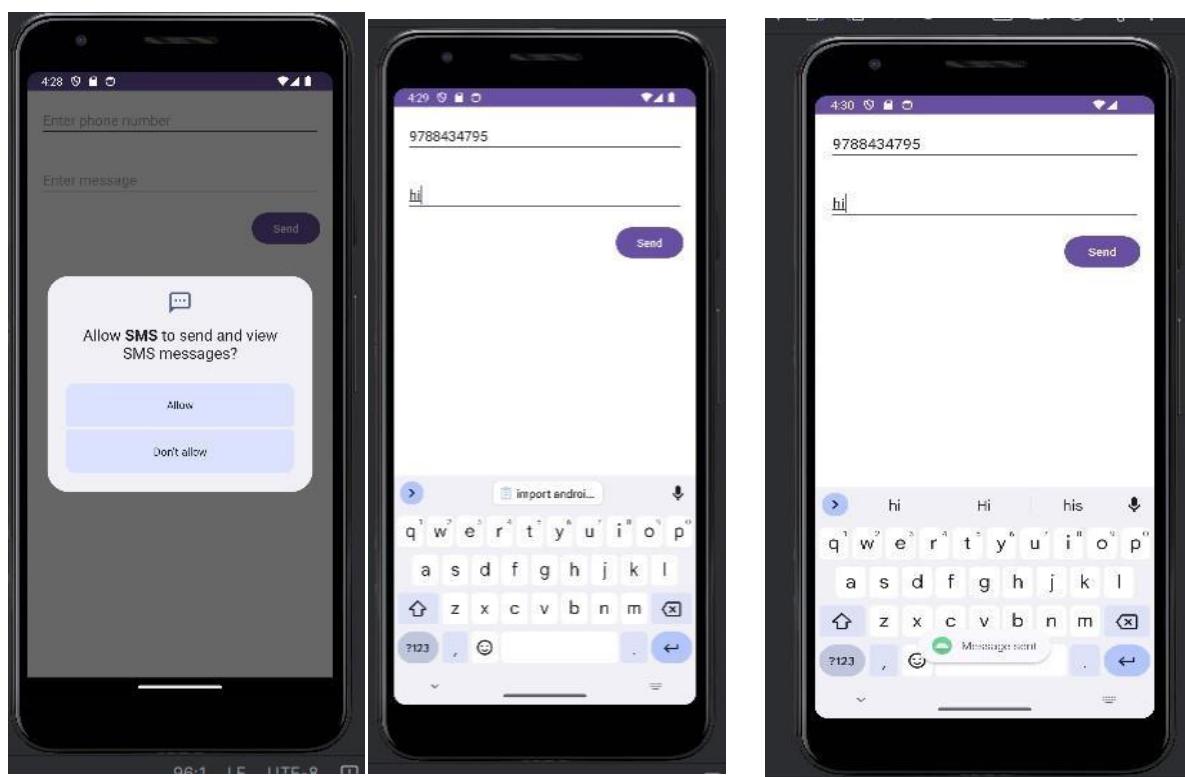
// Request SMS permission
private void requestSMSPermission() { ActivityCompat.requestPermissions(this, new
String[]{Manifest.permission.SEND_SMS}, SMS_PERMISSION_CODE);
}

// SMS receiver
private final BroadcastReceiver smsReceiver = new BroadcastReceiver()
{
    @Override
    public void onReceive(Context context, Intent intent) { Bundle bundle = intent.getExtras();
if (bundle != null)

```

```
{  
    Object[] pdus = (Object[]) bundle.get("pdus");  
    if (pdus != null) {  
        for (Object pdu : pdus)  
        {  
            SmsMessage smsMessage = SmsMessage.createFromPdu((byte[]) pdu);  
            String senderPhoneNumber = smsMessage.getDisplayOriginatingAddress();  
            String messageBody = smsMessage.getMessageBody();  
            textViewReceivedMessages.append("From: " + senderPhoneNumber + "\n");  
            textViewReceivedMessages.append("Message: " +  
                messageBody + "\n\n");  
        }  
    }  
};  
{
```

Output



Program 11: Create an application to send an e-mail.

Steps:

Click **Start**- **Android Studio**, a **Welcome to Android Studio** dialog box will appear. Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language** as **Java**, and Select the **SDK as API 24("Nougat",Android 7.0)**.Click **Finish** Button.

Update the following code **in activity_main.xml and MainActivity.java**

Click **Run app** or **shift+F10** to execute the application.

activity_main.xml

```
<?xml version="1.0" encoding="utf8"?>
<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">
    <EditText
        android:id="@+id/editTextTo"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="To"/>
    <EditText
        android:id="@+id/editTextSubject"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/editTextTo"
        android:hint="Subject"/>
    <EditText
        android:id="@+id/editTextMessage"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@+id/editTextSubject"
        android:hint="Message"/>
    <Button
        android:id="@+id/buttonSend"
        android:layout_width="wrap_content"
```

```
    android:layout_height="wrap_content"
    android:layout_below="@+id/editTextMessage"
    android:text="Send"/>
</RelativeLayout>
```

Mainactivity.java

```
package com.bca.email;

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

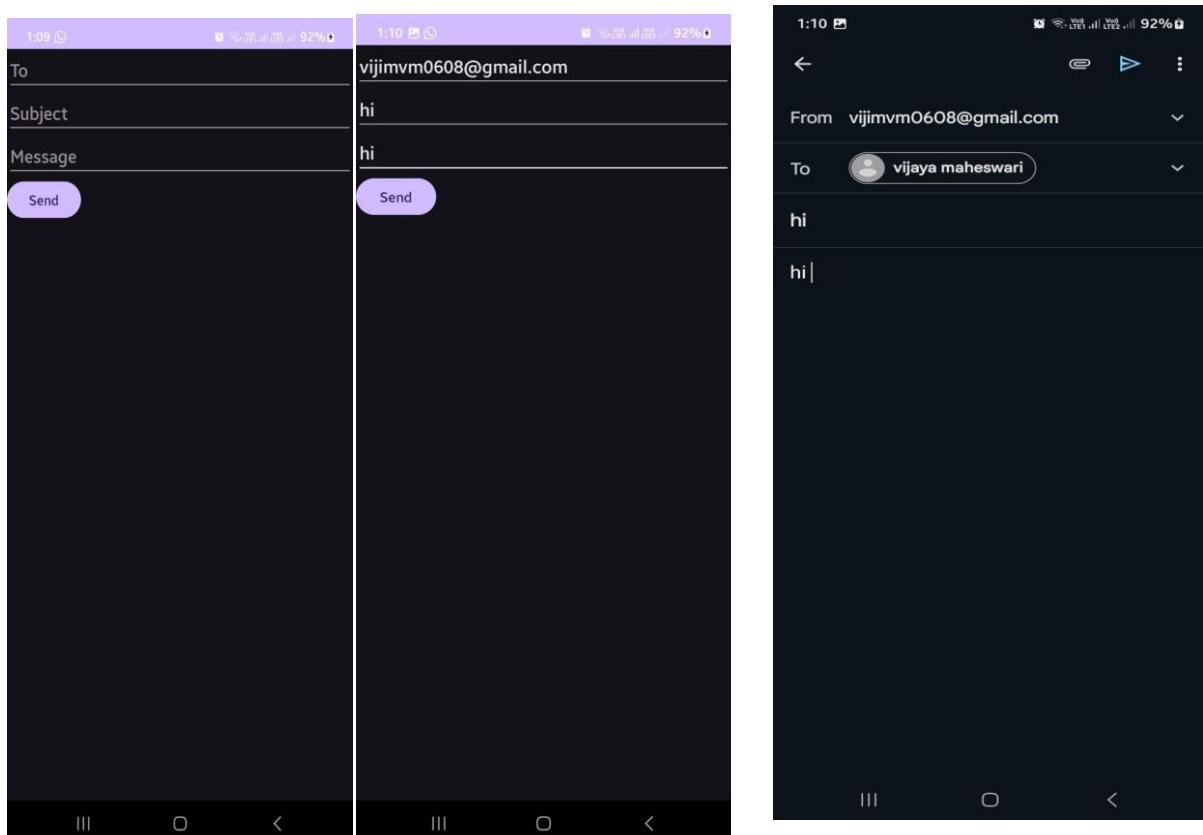
public class MainActivity extends AppCompatActivity {
    EditText editTextTo, editTextSubject, editTextMessage;
    Button buttonSend;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        editTextTo = findViewById(R.id.editTextTo);
        editTextSubject = findViewById(R.id.editTextSubject);
        editTextMessage = findViewById(R.id.editTextMessage);
        buttonSend = findViewById(R.id.buttonSend);
        buttonSend.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                sendEmail();
            }
        });
    }
}
```

```

@SuppressLint("QueryPermissionsNeeded")
private void sendEmail() {
    String to = editTextTo.getText().toString().trim();
    String subject = editTextSubject.getText().toString().trim();
    String message = editTextMessage.getText().toString().trim();
    Intent intent = new Intent(Intent.ACTION_SEND);
    intent.setType("text/plain");
    intent.putExtra(Intent.EXTRA_EMAIL, new String[]{to});
    intent.putExtra(Intent.EXTRA_SUBJECT, subject);
    intent.putExtra(Intent.EXTRA_TEXT, message);
    if (intent.resolveActivity(getPackageManager()) != null)
    {
        startActivity(Intent.createChooser(intent, "Choose an email client"));
    }
}

```

OUTPUT



Program 12: Display Map based on the Current/given location.

Steps:

Click **Start**- Android Studio, a **Welcome to Android Studio** dialog box will appear.

Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language** as **Java**, and Select the **SDK as API 24("Nougat",Android 7.0)**.Click **Finish** Button.

Update the following code **in activity_main.xml, Androidmanifest.xml and MainActivity.java**

Click **Run app** or **shift+F10** to execute the application.

MainActivity.java

```
import android.os.Bundle;  
  
import android.widget.Toast;  
  
import androidx.annotation.NonNull;  
  
import androidx.appcompat.app.AppCompatActivity;  
  
import com.google.android.gms.maps.CameraUpdateFactory;  
  
import com.google.android.gms.maps.GoogleMap;  
  
import com.google.android.gms.maps.OnMapReadyCallback;  
  
import com.google.android.gms.maps.SupportMapFragment;  
  
import com.google.android.gms.maps.model.LatLng;  
  
import com.google.android.gms.maps.model.MarkerOptions;  
  
public class MainActivity extends AppCompatActivity implements OnMapReadyCallback {  
  
    private GoogleMap mMap;  
  
    private double latitude = 0.0;  
  
    private double longitude = 0.0;  
  
    @Override  
  
    protected void onCreate(Bundle savedInstanceState) {
```

```

super.onCreate(savedInstanceState);

setContentView(R.layout.activity_main);

// Obtain the SupportMapFragment and get notified when the map is ready to be used.
SupportMapFragment mapFragment = (SupportMapFragment)
getSupportFragmentManager()

.findFragmentById(R.id.map);

if (mapFragment != null) {

    mapFragment.getMapAsync(this);

} else {

    Toast.makeText(this, "Map Fragment Not Found", Toast.LENGTH_SHORT).show();

}

}

@Override
public void onMapReady(@NonNull GoogleMap googleMap) {

mMap = googleMap;

// Add a marker at current or given location and move the camera

LatLng location = new LatLng(latitude, longitude);

mMap.addMarker(new MarkerOptions().position(location).title("Marker"));

mMap.moveCamera(CameraUpdateFactory.newLatLngZoom(location, 15));

}

}

```

activity_main.xml

```

<?xml version="1.0" encoding="utf8"?>

<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">

```

```
<fragment
    android:id="@+id/map"
    android:name="com.google.android.gms.maps.SupportMapFragment"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:layout_alignParentTop="true"
    android:layout_alignParentBottom="true"
    android:layout_alignParentStart="true"
    android:layout_alignParentEnd="true" />

</RelativeLayout>
```

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf8"?>

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

    package="com.yourpackage.yourappname">

    <usespermission android:name="android.permission.ACCESS_FINE_LOCATION" />

    <usespermission android:name="android.permission.ACCESS_COARSE_LOCATION" />

    <usespermission android:name="android.permission.INTERNET" />

    <application

        android:allowBackup="true"

        android:icon="@mipmap/ic_launcher"

        android:label="@string/app_name"

        android:roundIcon="@mipmap/ic_launcher_round"

        android:supportsRtl="true"

        android:theme="@style/AppTheme">
```

```

<! Google Maps API Key >

<metadata

    android:name="com.google.android.geo.API_KEY"
    android:value="YOUR_API_KEY_HERE" />

<activity android:name=".MainActivity">

    <intentfilter>

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

</activity>

</application>

</manifest>

```

Program 13: Create a sample application with login module(check user name and password)
On successful login change TextView “Login Successful”. On login fail alert using Toast “login fail”

Steps:

Click **Start- Android Studio**, a **Welcome to Android Studio** dialog box will appear.

Click **New Project**, the **New Project Dialog box** appears.

Choose **Empty Views Activity** then click **Next**.

Specify the **Name** of your project, Select the **Language** as **Java**, and Select the **SDK as API 24(“Nougat”,Android 7.0)**.Click **Finish** Button.

Update the following code **in activity_main.xml and MainActivity.java**

Click **Run app** or **shift+F10** to execute the application.

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=".MainActivity"
android:orientation="vertical"
android:padding="16dp">
<TextView android:id="@+id/tvTitle"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="24sp"
    android:text="Login Form"
    android:layout_gravity="center"/>
<TextView android:id="@+id/tvUserName"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="20sp"
    android:text="User Name" />
<EditText
    android:id="@+id/etUsername"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Username"
    android:inputType="text"
    android:padding="8dp"
    android:layout_marginTop="16dp"
    android:layout_marginBottom="30dp"/>
<TextView android:id="@+id/tvPassword"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="20sp"
    android:text="Password" />
<EditText
    android:id="@+id/etPassword"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:hint="Password"
    android:inputType="textPassword"
    android:padding="8dp"/>
```

```
    android:layout_marginTop="16dp"
    android:layout_marginBottom="30dp"/>
<Button
    android:id="@+id	btnLogin"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:text="Login"
    android:textSize="18sp"
    android:layout_marginTop="16dp"/>
<TextView android:id="@+id/tvMessage"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:textSize="20sp"
    android:text="Password" />
</LinearLayout>
```

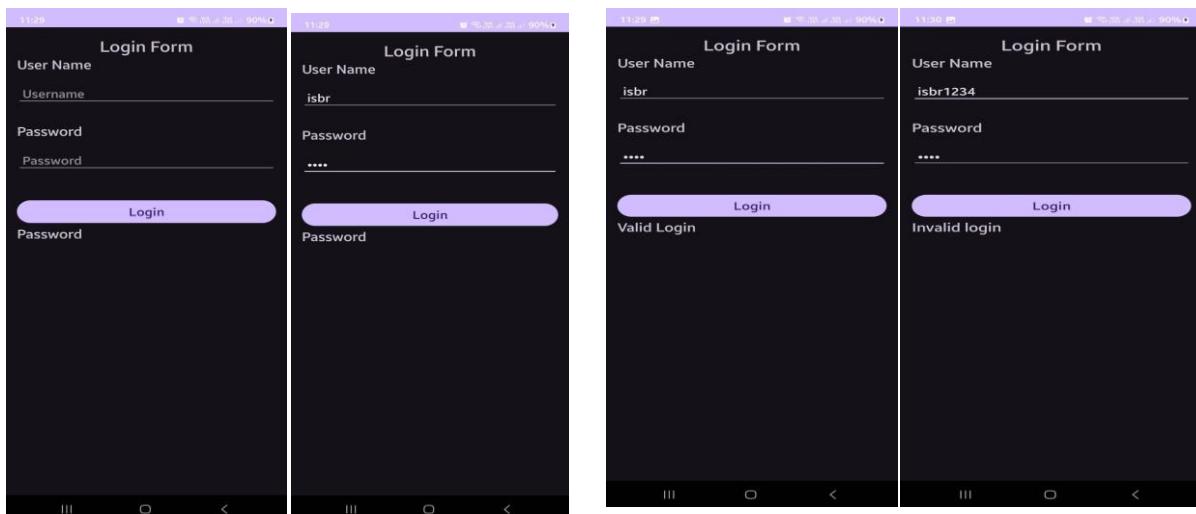
Mainactivity.java

```
package com.bca.loginprgrm;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;
public class MainActivity extends AppCompatActivity {
    EditText etUsername,etPassword; Button btnLogin;
    TextView tvMessage;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        btnLogin = (Button) findViewById(R.id.btnLogin);
        etUsername = (EditText) findViewById(R.id.etUsername);
        etPassword = (EditText) findViewById(R.id.etPassword);
        tvMessage = (TextView) findViewById(R.id.tvMessage);
```

```

btnLogin.setOnClickListener(new View.OnClickListener()
{
    @Override
    public void onClick(View view)
    {
        if(etUsername.getText().toString().isEmpty())
        {
            etUsername.setError("Enter User name");
        } else if (etPassword.getText().toString().isEmpty()) {
            etPassword.setError("Enter Password");
        }
        else if(etUsername.getText().toString().equals("isbr") &&
                etPassword.getText().toString().equals("isbr"))
        {
            tvMessage.setText("Valid Login");
        }
        else
        {
            tvMessage.setText("Invalid login");
        }
    }
});
```

OUTPUT



Program14: Learn to deploy Android applications.

Steps to Deploy an Android Application

1. Prepare App (use Program 1 Hello world for this program)

- Optimize performance and test thoroughly.
- Ensure compatibility with various devices.

activity_main.xml

```
<?xml version="1.0" encoding="utf8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        android:textSize="30sp"/>
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java

```
package com.bca.helloworld;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
public class MainActivity extends AppCompatActivity
{
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
```

```
        setContentView(R.layout.activity_main);  
    }  
}
```

2. Generate Signed APK (Android Package Kit):

- In Android Studio, navigate to Build > Generate Signed Bundle/APK.
- Follow the prompts to create a new keystore or use an existing one. A keystore is a binary file that contains a set of private keys.
- Configure the build type (release) and signing configuration.
- Generate the signed APK file.

3. Test Your Signed APK:

- Before distributing your app, test the signed APK to ensure that the signing process didn't introduce any issues.
- Install the APK on various devices and perform thorough testing.
- Release on Google Play Console:
 - Sign in to the Google Play Console (<https://play.google.com/apps/publish>).
 - Create a new app entry if this is your first release or select an existing app.
 - Complete all the required information for the app listing, including the title, description, screenshots, and categorization.
 - Upload your signed APK file.
 - Set pricing and distribution options.
 - Optimize your store listing for search and conversion.
 - Once everything is set, click the "Publish" button to release your app to the Google Play Store.

5. Other Distribution Channels (Optional):

- Besides Google Play, you can distribute your app through other channels such as Amazon Appstore, Samsung Galaxy Store, or thirdparty app marketplaces.
- Each distribution channel may have its own requirements and submission process, so be sure to follow their guidelines.

6. Monitor and Update:

- Keep an eye on user feedback and app performance metrics through the Google Play Console.
- Regularly update your app to fix bugs, add new features, and improve user experience based on feedback.