Mobile Application Lab Programs

1. **Creating "Hello world" Application**

Steps to create:

- 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.

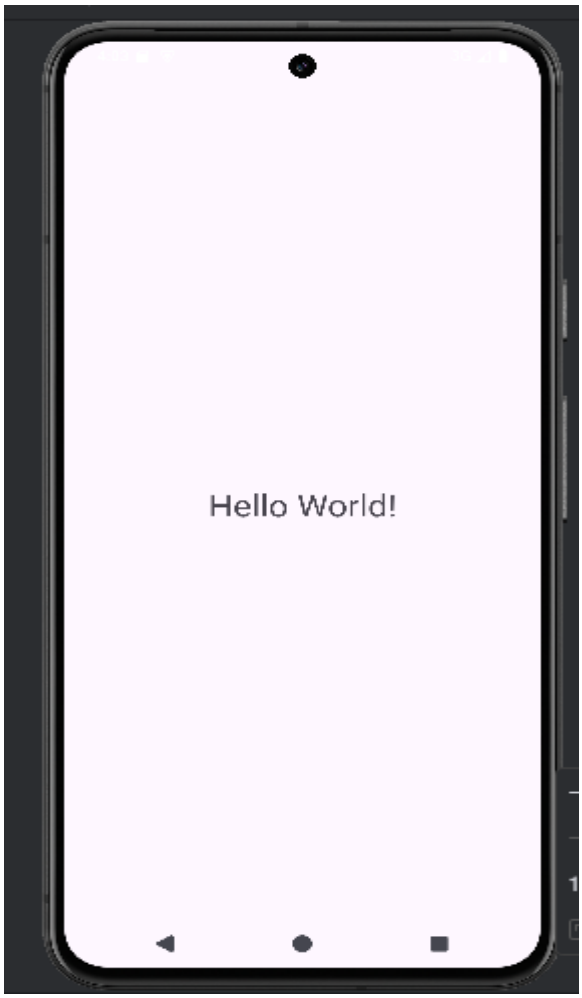
activity_main.xml

```
<?xml version="1.0" encoding="utf-8"?>
<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.example.bca.lab1program;

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);
    }
}
```

Output



2 Creating an application that displays message based on the screen orientation.
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_main2.xml, MainActivity.java and MainActivity2.java**
- Update the following code **in app manifests AndroidManifest.xml**
- To Create another activity **right click on app – new activity-Empty views Activity.**
- Update the following code **in activity_main2.xml and MainActivity2.java.**
- **Click Run App or Shift+F10** to execute the application.

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">
    <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.Program2"
        tools:targetApi="31">
        <activity
            android:name=".MainActivity2"
            android:exported="false"
            android:screenOrientation="landscape" />
        <activity
            android:name=".MainActivity"
            android:exported="true"
            android:screenOrientation="portrait" >
            <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"?>
<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/button1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginBottom="8dp"
        android:layout_marginTop="112dp"
        android:onClick="onClick"
        android:text="Launch next activity"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.612"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/editText1"
        app:layout_constraintVertical_bias="0.613" />

    <TextView
        android:id="@+id/editText1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_centerHorizontal="true"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        android:layout_marginTop="124dp"
        android:ems="10"
        android:textSize="22dp"
        android:text="This activity is portrait orientation"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.502"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

MainActivity.java

```
package com.example.bca.program2;

import androidx.appcompat.app.AppCompatActivity;
import android.content.Intent;
import android.os.Bundle;
import android.view.View;

public class MainActivity extends AppCompatActivity {

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

    public void onClick(View v)
    {
        Intent intent = new
Intent(MainActivity.this,MainActivity2.class);
        startActivity(intent);
    }
}
```

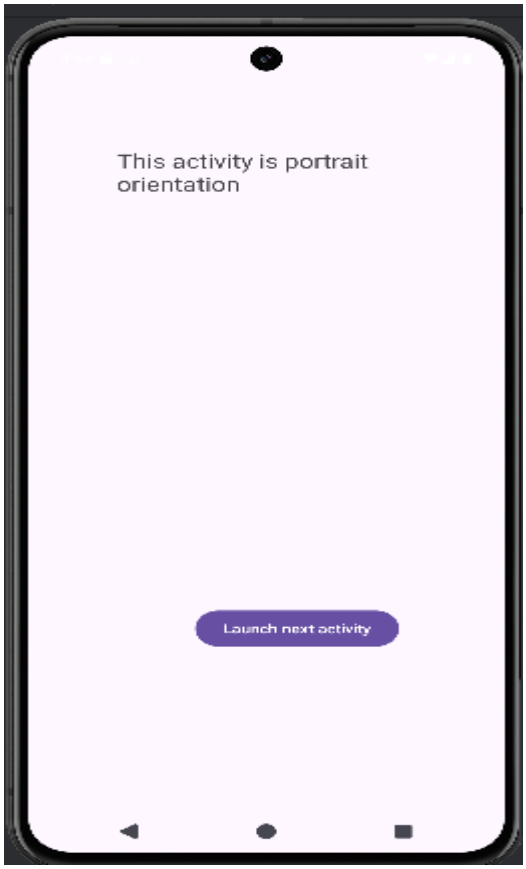
activity_main2.xml

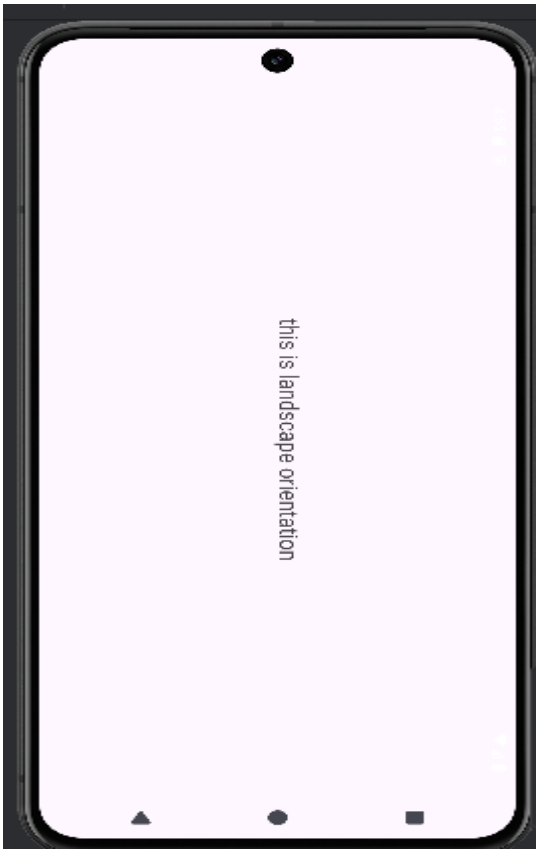
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
   android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity2">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginEnd="8dp"
        android:layout_marginStart="8dp"
        android:layout_marginTop="180dp"
        android:text="this is landscape orientation"
        android:textSize="22dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.502"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

MainActivity2.java

```
package com.example.bca.program2;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;

public class MainActivity2 extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main2);
    }
}
```

Output





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

Steps:

- 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.
- Create **background** resources (**bg_outer.xml**)
    - To create resource file, click **appresdrawable.** Right click **drawableNew Drawable Resource File.** The **New Resource File** dialog box appears.
    - Set **filename** as **bg_outer.xml**, **root element** as **shape** and then click **ok.**
- Modify the **bg_outer.xml** file
- Create **background** resources (**bg_inner.xml**)
    - To create resource file, click **appresdrawable.** Right click **drawableNew Drawable Resource File.** The **New Resource File** dialog box appears.
    - Set **filename** as **bg_inner.xml**, **root element** as **shape** and then click **ok.**
- Modify the **bg_inner.xml** file
- 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/and
roid"
    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="sansserifcondensedmedium"
        android:textColor="@color/black"
        android:paddingBottom="20dp"/>

        <EditText
            android:id="@+id/editTextUsername"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Username"
            android:layout_marginBottom="16dp"/>

        <EditText
            android:id="@+id/editTextPassword"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Password"
          android:layout_below="@id/editTextUsername"
            android:layout_marginBottom="16dp"
            android:inputType="textPassword"/>

        <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_inner.xml

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

bg_outer.xml

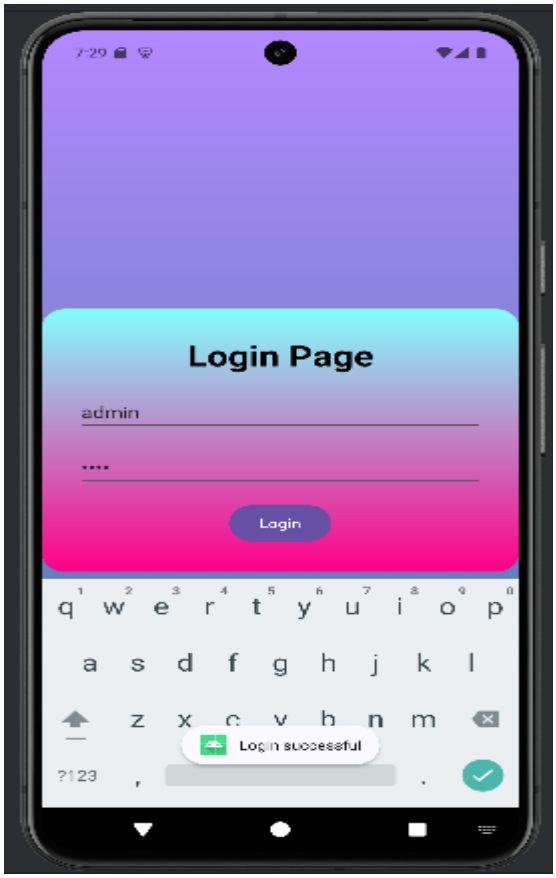
```
<?xml version="1.0" encoding="utf-8"?>
<shape
xmlns:android="http://schemas.android.com/apk/res/and
roid">
    <corners
        android:radius="12dp" />
    <gradient
        android:startColor="#B388FF"
        android:endColor="#397C9A"
        android:angle="100"/>
</shape>
```

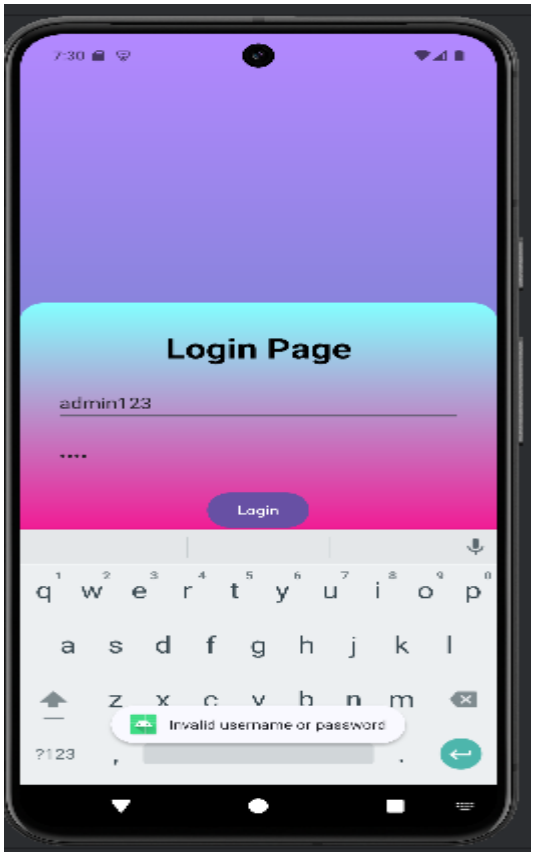
MainActivity.java

```
package com.example.bca.loginpgm;
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;

public class MainActivity extends AppCompatActivity
{
  private EditText editTextUsername,editTextPassword;
    private Button buttonLogin;
    @Override protected void onCreate(Bundle
savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        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();
                }
            }
        });
    }
}
```

OUTPUT





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

Steps: Follow Program 2

activity_new.xml

```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout

xmlns:android="http://schemas.android.com/apk/res/and
roid"
    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=".NewActivity">

    <TextView android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Welcome to Explicit Intent"
        android:textSize="28sp"

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.bca.intents;

import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
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);
    }
    public void onImplicitButtonClicked(View view)
    {
        Uri url=Uri.parse("https://www.google.com");
        Intent i=new Intent(Intent.ACTION_VIEW, url);
        startActivity(i);
    }
    public void onExplicitButtonClicked(View view )
    {
        Intent i=new Intent(MainActivity.this,
Activity_new.class);
        startActivity(i);
    }
}
```

activity_main.xml

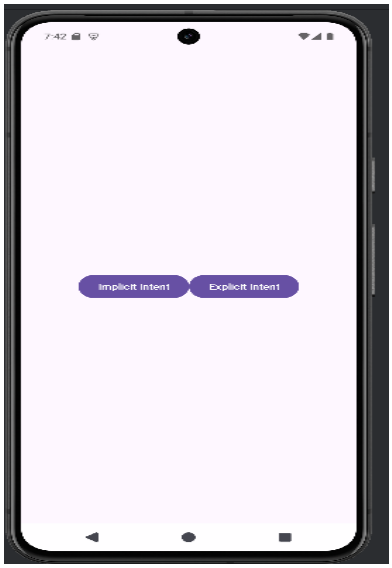
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
xmlns:android="http://schemas.android.com/apk/res/and
roid"
    xmlns:app="http://schemas.android.com/apk/res-
auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
tools:context=".MainActivity">

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

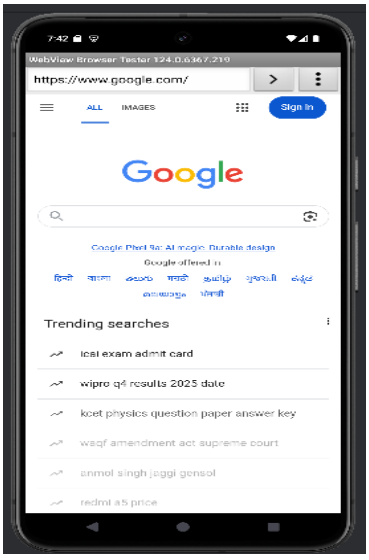
```
        android:text="Implicit Intent"
        android:onClick="onImplicitButtonClicked" />

    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Explicit Intent"
        android:onClick="onExplicitButtonClicked"/>

</LinearLayout>
```

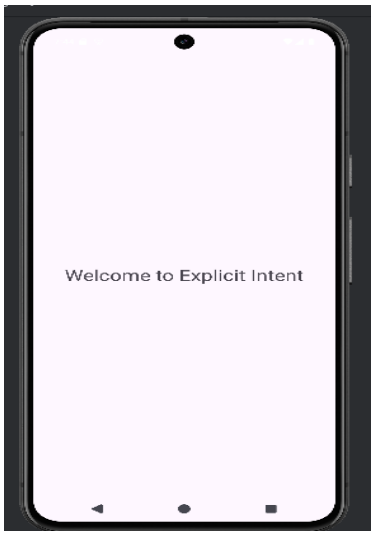
Activity_new.java

```
package com.example.bca.intents;

import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;

public class Activity_new extends AppCompatActivity {

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

Output







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

Steps:

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

2. Choose Empty Views Activity then click Next.

3. 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.

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

5. Create one TextView resource in activity_mainScreen.xml and update the following code

Activity_main.xml

```
<?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:gravity="center">

    <ImageView
        android:layout_width="183dp"
        android:layout_height="364dp"
        android:src="@drawable/welcome" />

</RelativeLayout>
```

Activity_mainscreen.xml

```
<?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=".mainScreen"
    android:gravity="center"
    android:background="#7E6C29">

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

```
        android:text="Welcome to home Page"
        android:textStyle="bold"
        android:textSize="32sp"
        android:textColor="@color/black"/>

</RelativeLayout>
```

Mainactivity.java

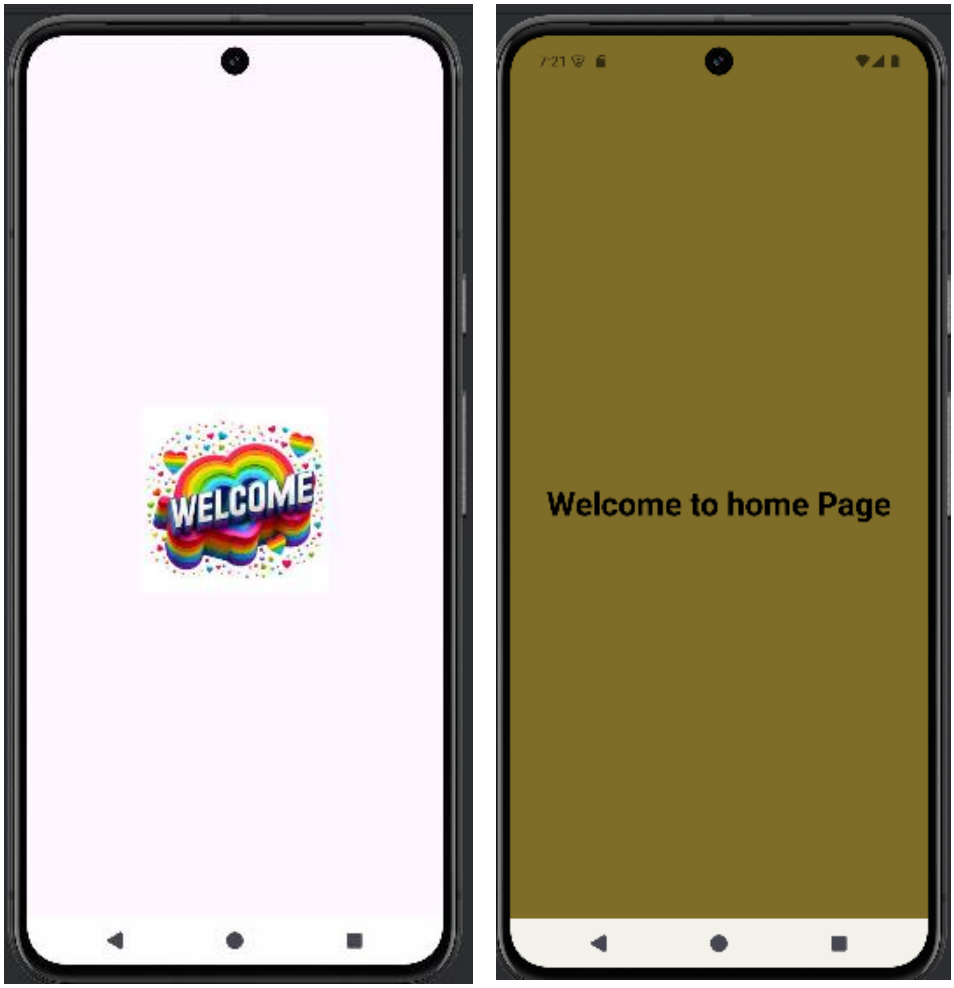
```
import android.content.Intent;
import android.os.Bundle;
import android.os.Handler;
import android.view.WindowManager;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {

    private static final int SPLASH_SCREEN_TIME_OUT = 10000;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        getWindow().setFlags(WindowManager.LayoutParams.FLAG_FULLSCREEN,
                WindowManager.LayoutParams.FLAG_FULLSCREEN);
                new Handler().postDelayed(new Runnable()
        {
            @Override
            public void run()
            {
                Intent i = new Intent(MainActivity.this, mainScreen.class);
                startActivity(i);
                finish();
            }
            }, SPLASH_SCREEN_TIME_OUT);
    }
}
```

Mainscreen.java

```
import android.os.Bundle;
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 mainScreen extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main_screen);
```

```
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main),
(v, insets) -> {
            Insets systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right,
systemBars.bottom);
            return insets;
        });
    }
}
```

Output



6. Create an UI with all views.

Steps:

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

2. Choose Empty Views Activity then click Next.

3. 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.

4. Create background resources(bg_outer.xml, bg_inner.xml, bg.xml)

a. To create resource file click appresdrawable. Right click drawableNew Drawable Resource File. The New Resource File dialog box appears.

b. Set filename as bg_outer.xml, root element as shape and then click ok. Modify the bg_outer.xml file

```
<?xml version="1.0" encoding="utf-8"?>
<shape xmlns:android="http://schemas.android.com/apk/res/android">
    <gradient
        android:startColor="#64EFAE"
        android:endColor="#84FFFF"
        android:angle="120"
        android:gradientRadius="5dp"/>
    <corners
        android:radius="20dp"/>
</shape>
```

C. Create another background resource for inner layout. Set filename as bg_inner.xml, root element as shape and then click ok. Modify the bg_inner.xml file

```
<?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"
        android:gradientRadius="5dp"/>
    <corners
        android:radius="20dp"
        android:topLeftRadius="70dp"
        android:bottomRightRadius="70dp"/>
</shape>
```

D. create another background resource for view. Set filename as bg.xml, root element as shape and then click ok. Modify the bg..xml file

```
<?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>
```

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="#26389C" />

    <ImageView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:src="@drawable/img"/>

    <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
            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="Email"
                android:textSize="20sp"
                android:textStyle="bold"
                android:textColor="#26389C"
                android:padding="15dp"/>
            <EditText
                android:id="@+id/email"
                android:layout_width="match_parent"
                android:layout_height="60dp"
                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="Sex"
                android:textSize="20sp"
                android:textStyle="bold"
                android:textColor="#26389C"
                android:padding="15dp"
                android:paddingEnd="40dp"/>
            <RadioGroup
                android:layout_width="wrap_content"
```

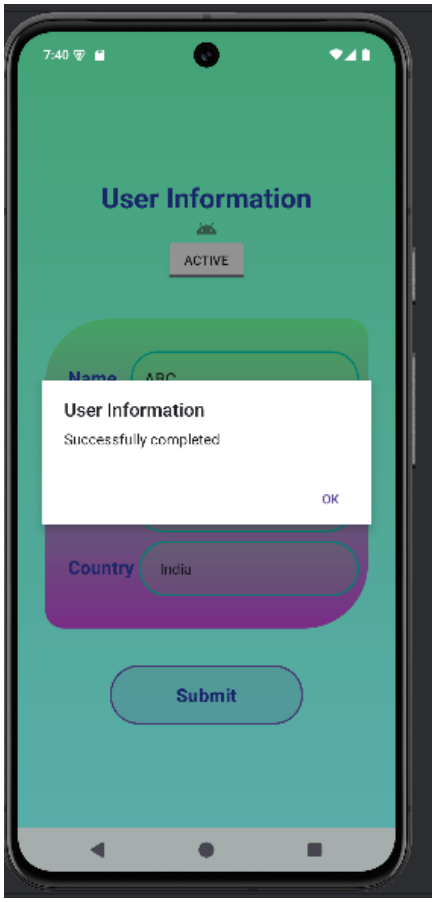
```
                android:layout_height="wrap_content"
                android:background="@drawable/bg"
                android:orientation="horizontal"
                android:id="@+id/sex">

                <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
            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:layout_width="match_parent"
                android:layout_height="60dp"
                android:id="@+id/country"
                android:padding="15dp"
                android:background="@drawable/bg"/>
        </LinearLayout>
    </LinearLayout>
    <View
        android:layout_width="match_parent"
        android:layout_height="40dp"/>
    <Button
        android:layout_width="210dp"
        android:layout_height="wrap_content"
        android:id="@+id/submit"
        android:background="@drawable/bg"
        android:padding="15dp"
        android:text="Submit"
        android:textColor="#26389C"
        android:textSize="20sp"
        android:textStyle="bold" />
</LinearLayout>
```

MainActivity.java

```
import android.app.Dialog;
import android.content.Context;
import android.content.DialogInterface;
import android.os.Bundle;
import android.view.View;
import android.view.ViewGroup;
import android.widget.ArrayAdapter;
import android.widget.Button;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.RadioGroup;
import android.widget.Spinner;
import android.widget.Toast;
import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AlertDialog;
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 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 adapter = new ArrayAdapter<>(this,
                android.R.layout.simple_spinner_item, item);

adapter.setDropDownViewResource(android.R.layout.simple_spinner_dropdown_it
em);
        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();
    }
}
```

Output



7 Create menu in Application

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

2. Choose Empty Views Activity then click Next.

3. 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.

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

5. To create a Menu Resource File: Rightclick 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>
```

MainActivity.java

```
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 onCreatePanelMenu(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 UsesPermission 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>
```

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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

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

Output

8 Read/ write the Local data

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: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

```
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.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="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=".MainActivity2"
    android:orientation="vertical">
```

```
    <Button
        android:id="@+id/btnFetch"
        android:layout_width="wrap_content"
        android:layout_height="93dp"
        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

```
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

9.Create / Read / Write data with database (SQL Lite)

HOW TO CREATE AN SQLITE DATABASE:
In the AndroidManifest.xml file you add permission to access the storage.(Add before Application tag)

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

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:orientation="vertical"
    android:padding="16dp">
    <TextView
        android:id="@+id/nameLabel"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Name" />
    <EditText
        android:id="@+id/nameEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter name" />
    <TextView
        android:id="@+id/emailLabel"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Email" />
    <EditText
        android:id="@+id/emailEditText"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Enter email" />
    <Button
        android:id="@+id/addButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Add Contact" />
    <Button
        android:id="@+id/viewAllButton"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="View All Contacts" />
   <TextView
        android:id="@+id/contactsTextView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:paddingTop="16dp"
        android:text="Contacts will be displayed here." />
</LinearLayout>
```

Create DBAdapter java class

DBAdapter.java

```
package com.example.bca.databasedemo;

import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.SQLException;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
public class DBAdapter
{
    static final String KEY_ROWID = "_id";
    static final String KEY_NAME = "name";
    static final String KEY_EMAIL = "email";
    static final String TAG = "DBAdapter";
    static final String DATABASE_NAME = "MyDB";
    static final String DATABASE_TABLE = "contacts";
    static final int DATABASE_VERSION = 1;
    static final String DATABASE_CREATE = "create table contacts(_id
integer primary key autoincrement, " +
                "name text not null, email text not null);";
    final Context context;
    DatabaseHelper DBHelper;
    SQLiteDatabase db;

    public DBAdapter(Context ctx)
    {
        this.context = ctx;
        DBHelper = new DatabaseHelper(context);
    }

    private static class DatabaseHelper extends SQLiteOpenHelper
    {
        DatabaseHelper(Context context) {
            super(context, DATABASE_NAME, null, DATABASE_VERSION);
        }
        @Override
        public void onCreate(SQLiteDatabase db)
        {
            try
            {
                db.execSQL(DATABASE_CREATE);
            }
            catch (SQLException e)
            {
                e.printStackTrace();
            }
        }
        @Override
        public void onUpgrade(SQLiteDatabase db, int oldVersion, int
newVersion)
        {
// handle database upgrade
        }
    }
    //— opens the database—
    public DBAdapter open() throws SQLException
    {
        db = DBHelper.getWritableDatabase();
```

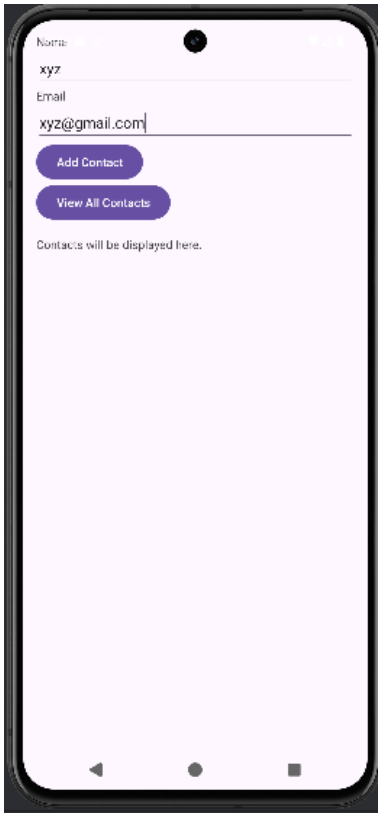
```
        return this;
    }
    //---closes the database—
    public void close()
    {
        DBHelper.close();
    }
    //— insert a contact into the database—
    public long insertContact(String name, String email)
    {
        ContentValues initialValues = new ContentValues();
        initialValues.put(KEY_NAME, name);
        initialValues.put(KEY_EMAIL, email);
        return db.insert(DATABASE_TABLE, null, initialValues);
    }

    //---retrieves all the contacts---
    public Cursor getAllContacts ()
    {
        return db.query(DATABASE_TABLE, new String[]{KEY_ROWID, KEY_NAME,
                KEY_EMAIL}, null, null, null, null, null);
    }

}
```

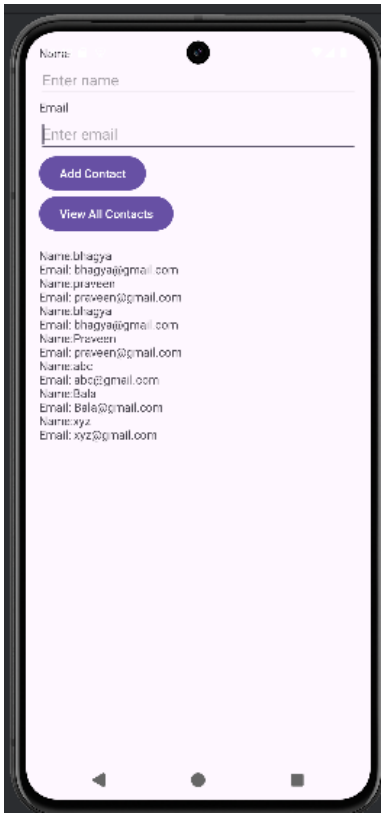
MainActivity.java

```
package com.example.bca.databasedemo;

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

public class MainActivity extends AppCompatActivity
{
    private DBAdapter dbAdapter;
    private EditText nameEditText;
    private EditText emailEditText;
    private TextView contactsTextView;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        dbAdapter = new DBAdapter(this);
        nameEditText = findViewById(R.id.nameEditText);
        emailEditText = findViewById(R.id.emailEditText);
        contactsTextView = findViewById(R.id.contactsTextView);
        Button addButton = findViewById(R.id.addButton);
        Button viewAllButton = findViewById(R.id.viewAllButton);

        addButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                dbAdapter.open();
                dbAdapter.insertContact(nameEditText.getText().toString(),
```

```
                        emailEditText.getText().toString());
                dbAdapter.close();
                nameEditText.setText("");
                emailEditText.setText("");
            }
        });

        viewAllButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                dbAdapter.open();
                Cursor cursor = dbAdapter.getAllContacts();
                StringBuilder result = new StringBuilder();
                if (cursor.moveToFirst()) {
                    do {
result.append("Name:").append(cursor.getString(1)).append("\n")
 .append("Email: ").append(cursor.getString(2)).append("\n");
                    } while (cursor.moveToNext());
                }
                cursor.close();
                dbAdapter.close();
                contactsTextView.setText(result.toString());
            }
        });
    }
}
```

Output





10. Create an application to send SMS and receive SMS.

AndroidManifest.xml

```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.bca.sms">
    <uses-feature
        android:name="android.hardware.telephony"
        android:required="false" />
    <uses-permission android:name="android.permission.SEND_SMS"/>

    <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/Base.Theme.SMS">
        <activity
            android:name="com.example.bca.sms.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>
```

MainActivity.java

```
package com.example.bca.sms;

import android.Manifest;
import android.content.pm.PackageManager;
import android.os.Bundle;
import android.telephony.SmsManager;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.Toast;
import androidx.annotation.NonNull;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.app.ActivityCompat;
import androidx.core.content.ContextCompat;

public class MainActivity extends AppCompatActivity {
    private static final int PERMISSION_REQUEST_CODE = 1;
    private EditText phoneNumberEditText;
    private EditText messageEditText;
    private Button sendSmsButton;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout. activity_main);
        phoneNumberEditText = findViewById(R .id.phone_number);
        messageEditText = findViewById(R.id.message);
```

```
        sendSmsButton = findViewById(R .id.send_sms);
        sendSmsButton.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v)
            {
                if (ContextCompat.checkSelfPermission(MainActivity.this,
                        Manifest.permission.SEND_SMS)!=
PackageManager.PERMISSION_GRANTED)
                {
                    ActivityCompat.requestPermissions(MainActivity.this,
new String[]
                            {Manifest.permission.SEND_SMS},
PERMISSION_REQUEST_CODE);
                }
                else
                {
                    sendSms();
                }
            }
        } ) ;
    }
    private void sendSms() {
        String phoneNumber = phoneNumberEditText.getText().toString();
        String message = messageEditText.getText().toString();
        try        {
            SmsManager smsManager = SmsManager.getDefault();
            smsManager.sendTextMessage(phoneNumber, null, message, null,
null);
            Toast.makeText(this, "SMS Sent", Toast.LENGTH_SHORT).show();
            phoneNumberEditText.setText("");
            messageEditText.setText("");
        }
        catch (Exception e)        {
            Toast.makeText(this, "SMS Failed to Send",
Toast.LENGTH_SHORT).show();
            e.printStackTrace();
        }
    }
    @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) {
                sendSms();
            } else
            {
                Toast.makeText(this, "Permission Denied",
Toast.LENGTH_SHORT).show();
            }
        }
    }
}
```

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:orientation="vertical"
    android:padding="16dp" >

    <EditText
            android:id="@+id/phone_number"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:hint=" Please Enter Phone Number"
            android:inputType="phone" />

    <EditText
        android:id="@+id/message"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="M e s s a g e "
        android:inputType="textMultiLine" />

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

</LinearLayout>
```

Output

11.Create an application to send an e-mail

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"
    tools:context=".MainActivity"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingLeft="20dp"
    android:paddingRight="20dp"
    android:orientation="horizontal">

    <EditText
         android:id="@+id/etTo"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignParentEnd="true"
        android:layout_alignParentTop="true"
        android:layout_marginEnd="22dp"
        android:layout_marginTop="16dp"
        android:ems="10" />

    <EditText
        android:id="@+id/etSub"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/etTo"
        android:layout_below="@+id/etTo"
        android:layout_marginTop="18dp"
        android:ems="10" >
    </EditText>

    <EditText
        android:id="@+id/etMsg"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/etSub"
        android:layout_below="@+id/etSub"
        android:layout_marginTop="28dp"
        android:ems="10"
        android:inputType="textMultiLine" />

    <TextView
        android:id="@+id/textView1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/etTo"
        android:layout_alignBottom="@+id/etTo"
        android:layout_alignParentLeft="true"
        android:text="To:" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/etSub"
        android:layout_alignBottom="@+id/etSub"
        android:layout_alignParentLeft="true"
        android:text="Subject:" />
```

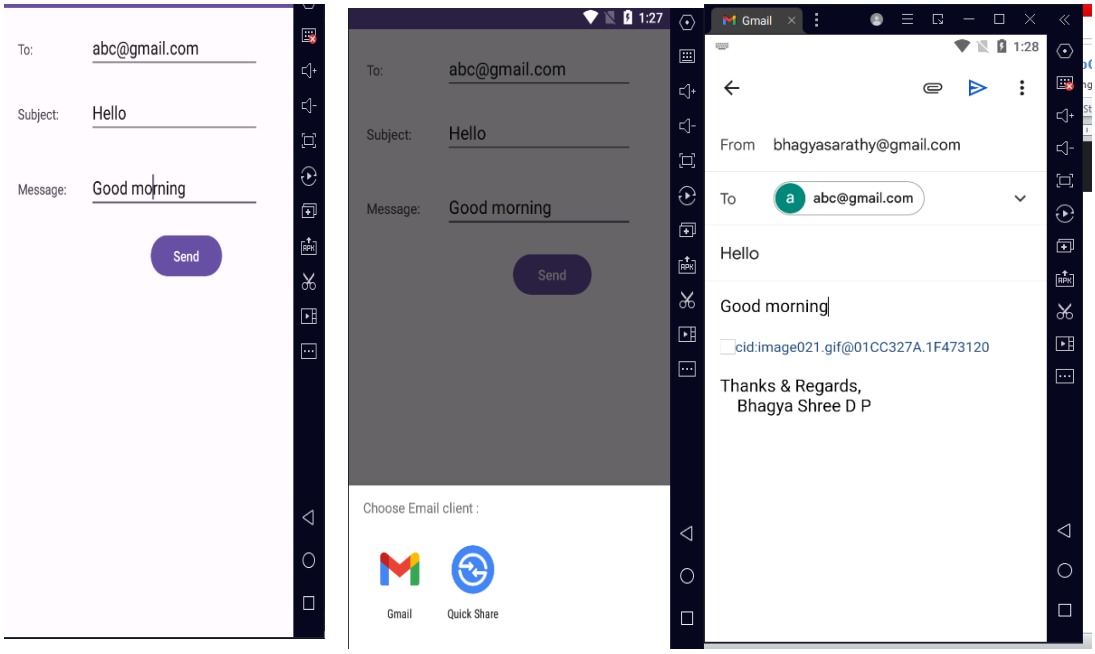
```
    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/etMsg"
        android:layout_alignBottom="@+id/etMsg"
        android:layout_alignParentLeft="true"
        android:text="Message:" />

    <Button
        android:id="@+id/btSend"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignLeft="@+id/etMsg"
        android:layout_below="@+id/etMsg"
        android:layout_marginLeft="76dp"
        android:layout_marginTop="20dp"
        android:text="Send" />

</RelativeLayout>
```

MainActivity.java

```
package com.example.bca.email;

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

public class MainActivity extends AppCompatActivity
{
    EditText etTo, etSub, etMsg;
    Button btSend;
    String to, subject, message;

    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        etTo = (EditText) findViewById(R.id.etTo);
        etSub = (EditText) findViewById(R.id.etSub);
        etMsg = (EditText) findViewById(R.id.etMsg);

        btSend = (Button) findViewById(R.id.btSend);
        btSend.setOnClickListener(new View.OnClickListener()
        {
            @Override
            public void onClick(View view) {
                to = etTo.getText().toString();
                subject = etSub.getText().toString();
                message = etMsg.getText().toString();

                Intent email = new Intent(Intent.ACTION_SEND);
                email.putExtra(Intent.EXTRA_EMAIL, new String[]{to});
                email.putExtra(Intent.EXTRA_SUBJECT, subject);
                email.putExtra(Intent.EXTRA_TEXT, message);
```

```
                //need this to prompts email client only

                email.setType("message/rfc822");
                startActivity(Intent.createChooser(email, "Choose Email
client :"));
            }
        });
    }
}
```

Output



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

Update Manifest file

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

    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"
/>
    <uses-permission
android:name="android.permission.ACCESS_COARSE_LOCATION" />
    <uses-permission 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/Theme.LocationMaps"
        tools:targetApi="31">
    <meta-data
        android:name="com.google.android.geo.API_KEY"
        android:value="YOUR_API_KEY_HERE" />
        <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>
```

MainActivity.java

```
package com.example.bca.locationmaps;

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.MapView;
import com.google.android.gms.maps.MapsInitializer;
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
{
    private MapView mapView;
    private GoogleMap googleMap;
```

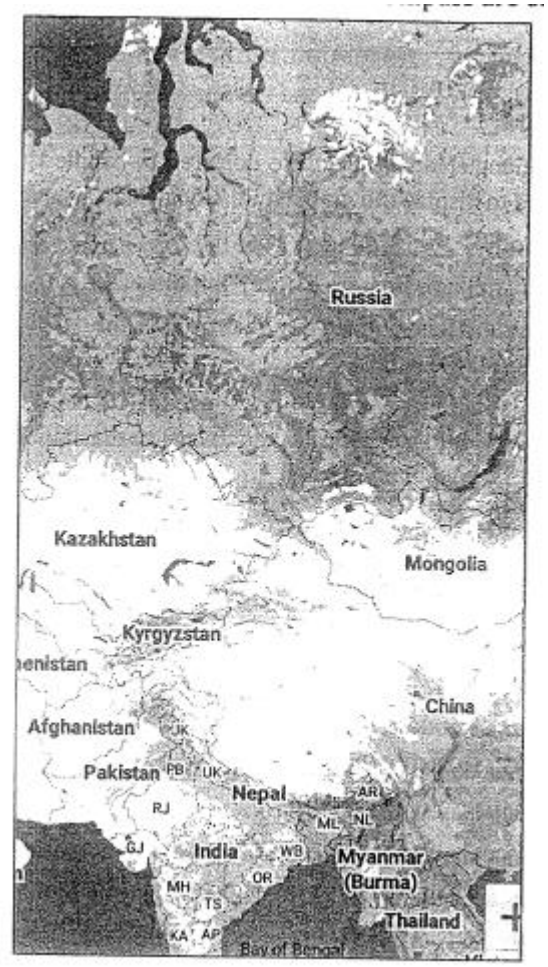
```
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);

        mapView = findViewById(R.id.mapView);
        mapView.onCreate(savedInstanceState);
        mapView.onResume();

        try
        {
            MapsInitializer.initialize(this);
        }
        catch (Exception e)
        {
            e.printStackTrace();
        }

        mapView.getMapAsync(new OnMapReadyCallback()
        {
            @Override
            public void onMapReady(GoogleMap mMap)
            {
                googleMap = mMap;
                googleMap.setMapType(GoogleMap.MAP_TYPE_NORMAL);
                googleMap.getUiSettings().setZoomControlsEnabled(true);
            }
        }) ;
    }
    @Override
    protected void onResume()
    {
        super.onResume();
        mapView.onResume();
    }
    @Override
    protected void onPause()
    {
        super.onPause();
        mapView.onPause();
    }
    @Override
    protected void onDestroy()
    {
        super.onDestroy();
        mapView.onDestroy();
    }
    @Override
    public void onLowMemory()
    {
        super.onLowMemory();
        mapView.onLowMemory() ;
    }
}
```

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:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <com.google.android.gms.maps.MapView
        android:id="@+id/mapView"
        android:layout_width="match_parent"
        android:layout_height="match_parent"/>

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

Output



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”

Activity_main.xml

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

    <TextView
        android:id="@+id/tvName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="21dp"
        android:layout_marginTop="49dp"
        android:text="User Name"
        android:textSize="18sp" />

    <EditText
        android:id="@+id/etUsername"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/tvName"
        android:layout_alignBottom="@+id/tvName"
        android:layout_alignParentEnd="true"
        android:layout_marginEnd="23dp"
        android:ems="10"
        android:inputType="textPersonName" />

    <TextView android:id="@+id/tvPass"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignEnd="@+id/tvName"
        android:layout_below="@+id/etUsername"
        android:layout_marginTop="32dp"
        android:text="Password"
        android:textSize="18sp" />

    <EditText
        android:id="@+id/etPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_alignBaseline="@+id/tvPass"
        android:layout_alignBottom="@+id/tvPass"
        android:layout_alignStart="@+id/etUsername"
        android:ems="10"
        android:inputType="textPassword" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@+id/etPassword"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="38dp"
        android:text="LOGIN"/>

    <TextView android:id="@+id/LoginStatus"
```

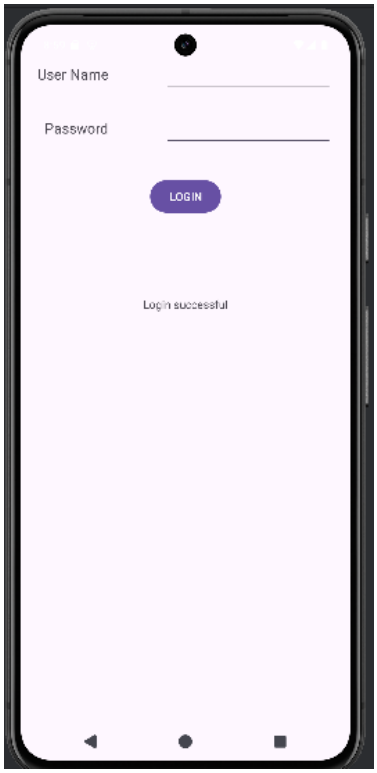
```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/button"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="100sp" />

</RelativeLayout>
```

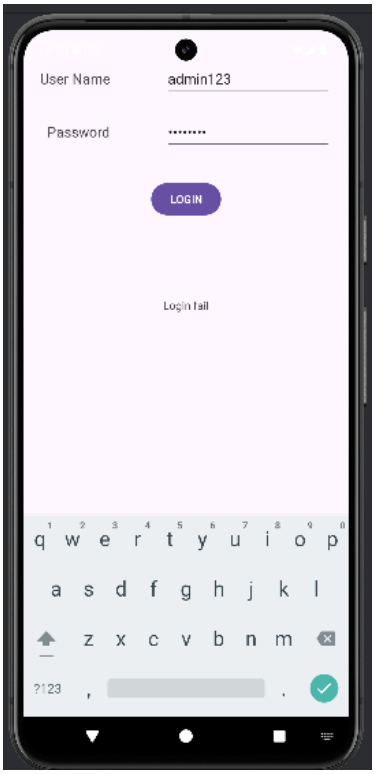
MainActivity.java

```
package com.example.bca.loginmodule;

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;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity
{
    EditText etUsername, etPassword; Button btnStatus; TextView
LoginStatus;
    @Override
    protected void onCreate(Bundle savedInstanceState)
    {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        etUsername = (EditText) findViewById(R.id.etUsername);
        etPassword = (EditText) findViewById(R.id.etPassword);
        btnStatus = (Button) findViewById(R.id.button);
        LoginStatus = (TextView) findViewById(R.id.LoginStatus);
        btnStatus.setOnClickListener(new View.OnClickListener()
        {
            @Override
            public void onClick(View v)
            {
                check();
            }
        });
    }
    public void check()
    {
        if(etUsername.getText().toString().equals("admin")
                && etPassword.getText().toString().equals("password"))
        {
            LoginStatus.setText("Login successful");
            etUsername.setText("");
            etPassword.setText("");
        }
        else
        {
            LoginStatus.setText("Login fail");
        }
    }
}
```

df'[

Output


User Name
Password
LOGIN
Login successful


User Name
admin123
Password
LOGIN
Login fail

Program 14

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/resauto"
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.

4. **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.

5. **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.