PROGRAM 1:

Write a program to change text on button click

Code :

activity_main.xml:

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

    <TextView
        android:id="@+id/t1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="50dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="50dp"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.529"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/button"
        app:layout_constraintVertical_bias="0.11" />

    <EditText
        android:id="@+id/e1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="50dp"
        android:layout_marginTop="228dp"
        android:layout_marginEnd="50dp"
        android:ems="10"
        android:hint="enter the text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
```

```
                app:layout_constraintTop_toTopOf="parent" />

        <Button
            android:id="@+id/button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="50dp"
            android:layout_marginTop="35dp"
            android:layout_marginEnd="50dp"
            android:onClick="view"
            android:text="Button"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@+id/e1" />

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

MainActivity.java:

```
package com.example.toastmessage;

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

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 EditText t1;
    private TextView tv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.main), (v,
insets) -> {
        Insets systemBars =
insets.getInsets(WindowInsetsCompat.Type.systemBars());
```
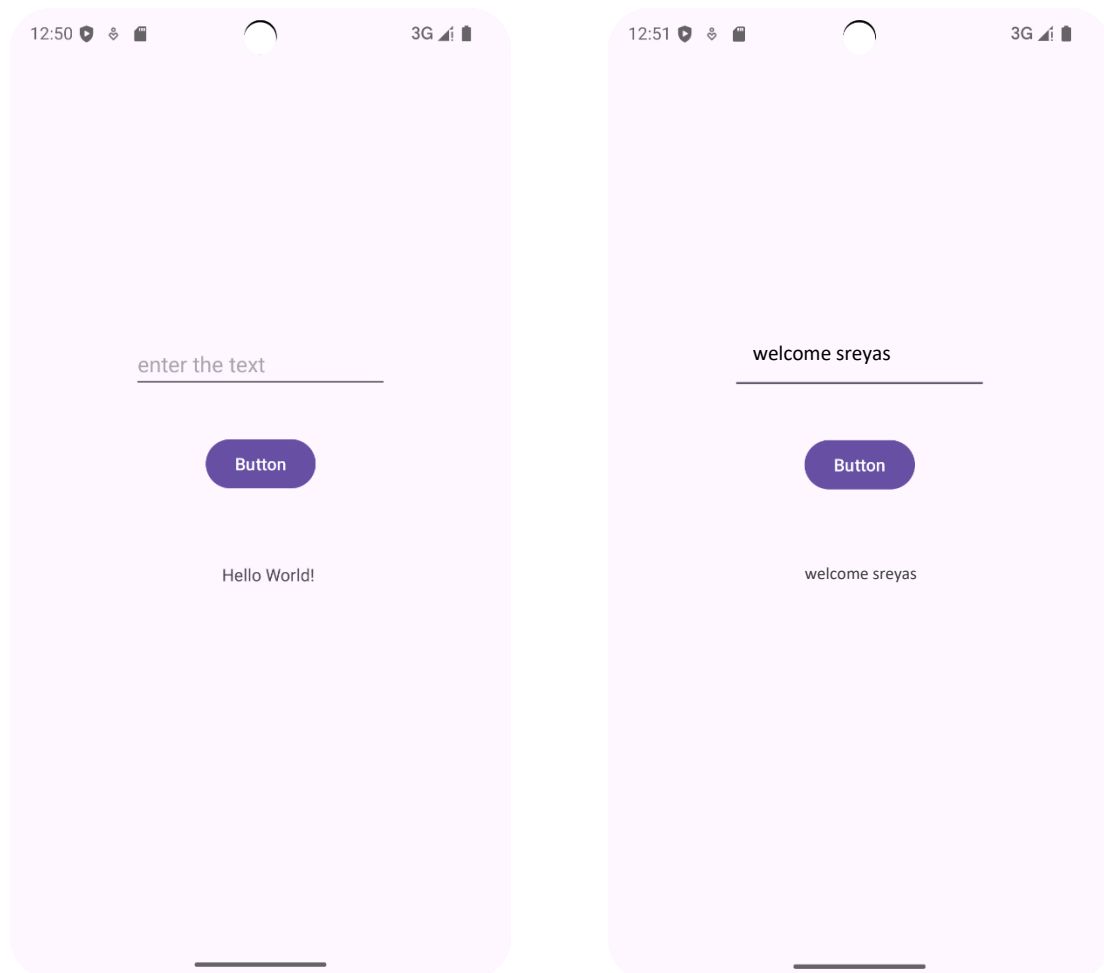
```
            v.setPadding(systemBars.left, systemBars.top, systemBars.right,
systemBars.bottom);
            return insets;
        });
        t1 = findViewById(R.id.e1);
        tv = findViewById(R.id.t1);
    }

    public void view(View view) {
        tv.setText(t1.getText().toString());
    }
}
```

Output :

PROGRAM 2:

Write a program to toast text on button click

Code :

activity_main.xml:

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android: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:layout_marginStart="20dp"
        android:layout_marginTop="28dp"
        android:layout_marginEnd="20dp"
        android:text="click here"
        android:onClick="click"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/editTextText" />

    <EditText
        android:id="@+id/editTextText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="205dp"
        android:layout_marginEnd="20dp"
        android:ems="10"
        android:hint="Enter text"
        android:inputType="text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
```

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

MainActivity.java:

```java
package com.example.toast;

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

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 EditText t1;
        @Override
        protected void onCreate(Bundle savedInstanceState) {
            super.onCreate(savedInstanceState);
            EdgeToEdge.enable(this);
            setContentView(R.layout.activity_main);

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;
        });
        t1 = findViewById(R.id.editTextText);
      }

    public void click(View view) {
        String s1=t1.getText().toString();
        Toast.makeText(this, s1, Toast.LENGTH_SHORT).show();
      }
    }
```
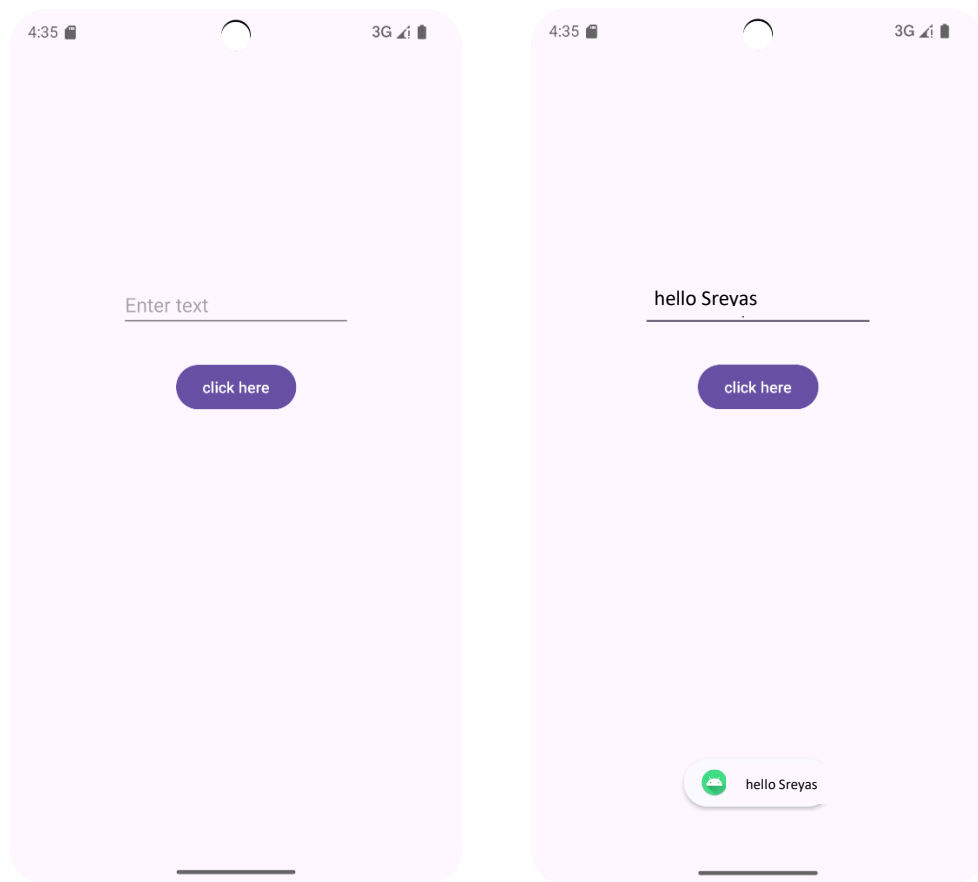
Output :

PROGRAM 3:

Write a program to change background color on button click

Code :

activity_main.xml:

```xml
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android: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:layout_marginStart="151dp"
        android:layout_marginTop="287dp"
        android:layout_marginEnd="169dp"
        android:text="Click here to change background"
        android:onClick="colorchange"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java:

```java
package com.example.randomcolor;

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

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.constraintlayout.widget.ConstraintLayout;
```

```java
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

import java.util.Random;

public class MainActivity extends AppCompatActivity {


    private ConstraintLayout b1;



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

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;
    });
    // Initialize the ConstraintLayout
    b1 = findViewById(R.id.main);
  }

    public void colorchange(View view) {
        Random random = new Random();
        int red = random.nextInt(256);   // Use 256 to include 255
        int green = random.nextInt(256); // Use 256 to include 255
        int blue = random.nextInt(256);  // Use 256 to include 255
        b1.setBackgroundColor(Color.rgb(red, green, blue));
    }
}
```
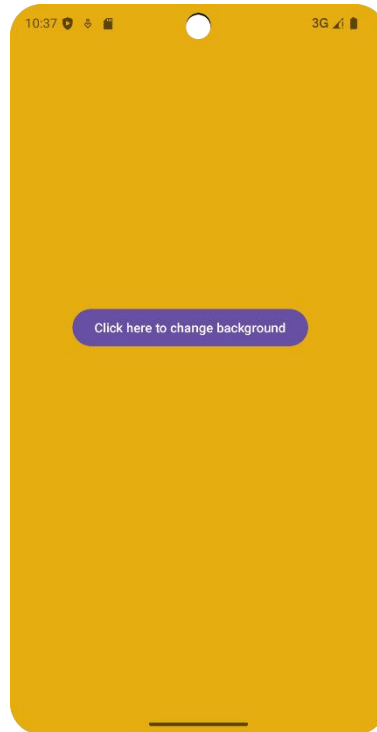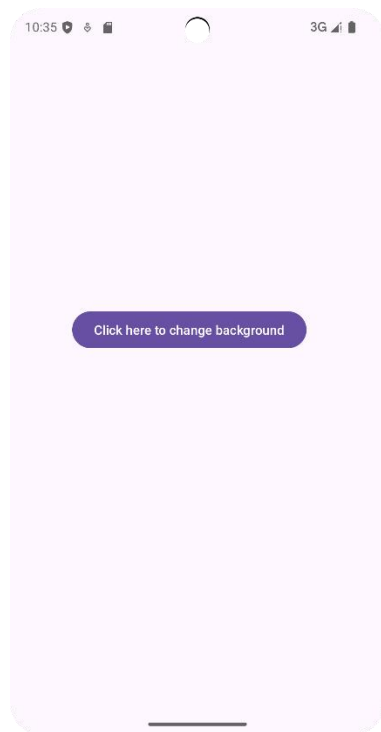
Output :

PROGRAM 4:

Design a Login Form with username and password using Constraint Layout and toast valid credentials

Code :

activity_main.xml:

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

  <EditText
    android:id="@+id/ed1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="100dp"
    android:layout_marginEnd="20dp"
    android:ems="10"
    android:hint="Username"
    android:inputType="text"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

  <EditText
    android:id="@+id/ed2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="20dp"
    android:layout_marginEnd="20dp"
    android:ems="10"
    android:hint="Password"
    android:inputType="text"
```

```xml
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@+id/ed1" />

        <Button
            android:id="@+id/button"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="108dp"
            android:layout_marginTop="48dp"
            android:text="login"
            android:onClick="login"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@+id/ed2" />

        <Button
            android:id="@+id/button2"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginTop="48dp"
            android:layout_marginEnd="112dp"
            android:text="cancel"
            android:onClick="cancel"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintTop_toBottomOf="@+id/ed2" />

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

MainActivity.java:

```java
package com.example.login;

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

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 {
```
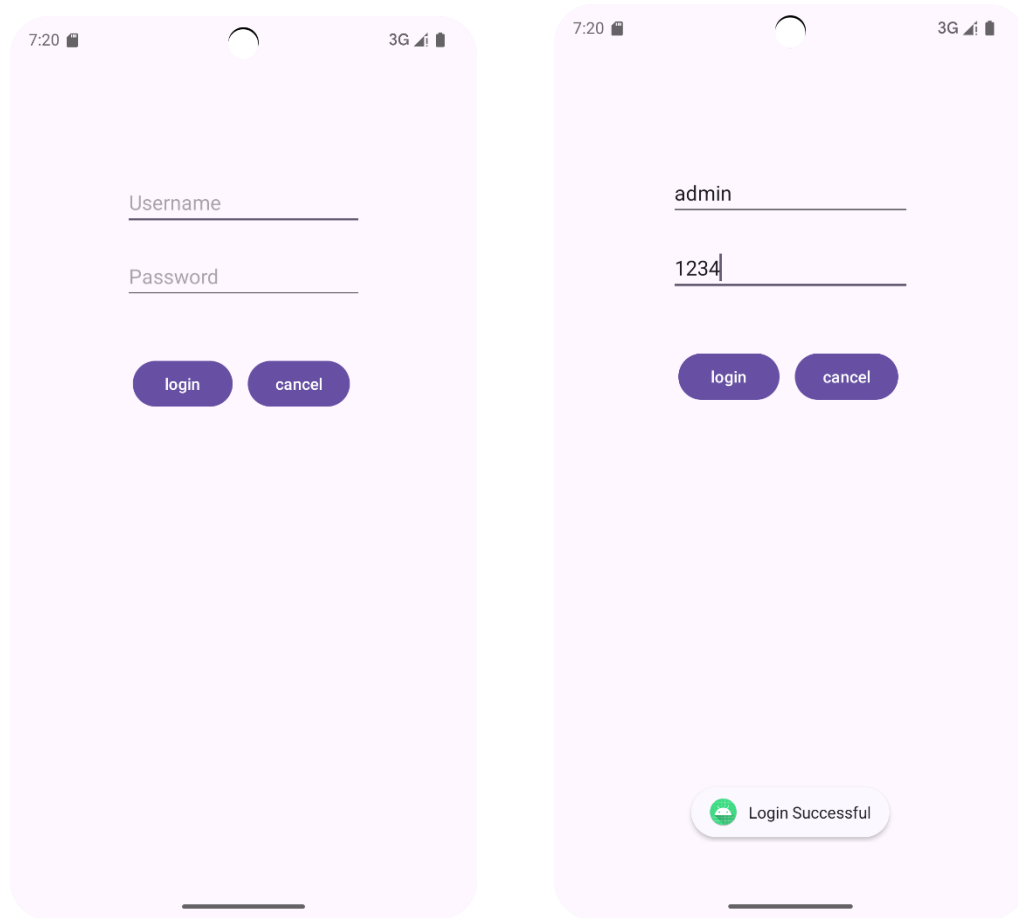
```java
    private EditText o1;
    private EditText o2;
    private TextView v1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

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;
    });
    o1 = findViewById(R.id.ed1);
    o2 =  findViewById(R.id.ed2);
    }

    public void login(View view) {
        String username = o1.getText().toString();
        String password = o2.getText().toString();
        if (isValidCredentials(username, password)) {
    Toast.makeText(this, "Login Successful", Toast.LENGTH_SHORT).show();
        } else {
     Toast.makeText(this, "Invalid credentials", Toast.LENGTH_SHORT).show();
        }
    }

    public void cancel(View view) {
        o1.setText("");
        o2.setText("");
    }

    private boolean isValidCredentials(String username, String password) {
        return username.equals("admin") && password.equals("1234");
    }
}
```

Output :

PROGRAM 5:

Write a program that demonstrates Activity Lifecycle.

Code :

activity_main.xml:

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

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

MainActivity.java:

```java
package com.example.activity;

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

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 {
```

```java
    private static final String TAG = "LifecycleExample";
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

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;
        });

  Log.d(TAG,"On create called");
  Toast.makeText(this, "Activity Created", Toast.LENGTH_SHORT).show();
}

@Override
protected void onStart() {
  super.onStart();
  Log.d(TAG, "onStart called");
  Toast.makeText(this, "Activity Started", Toast.LENGTH_SHORT).show();
}

@Override
protected void onResume() {
  super.onResume();
  Log.d(TAG, "onResume called");
  Toast.makeText(this, "Activity Resumed", Toast.LENGTH_SHORT).show();
}

@Override
protected void onPause() {
  super.onPause();
  Log.d(TAG, "onPause called");
  Toast.makeText(this, "Activity Paused", Toast.LENGTH_SHORT).show();
}

@Override
protected void onStop() {
  super.onStop();
  Log.d(TAG, "onStop called");
  Toast.makeText(this, "Activity Stopped", Toast.LENGTH_SHORT).show();
```
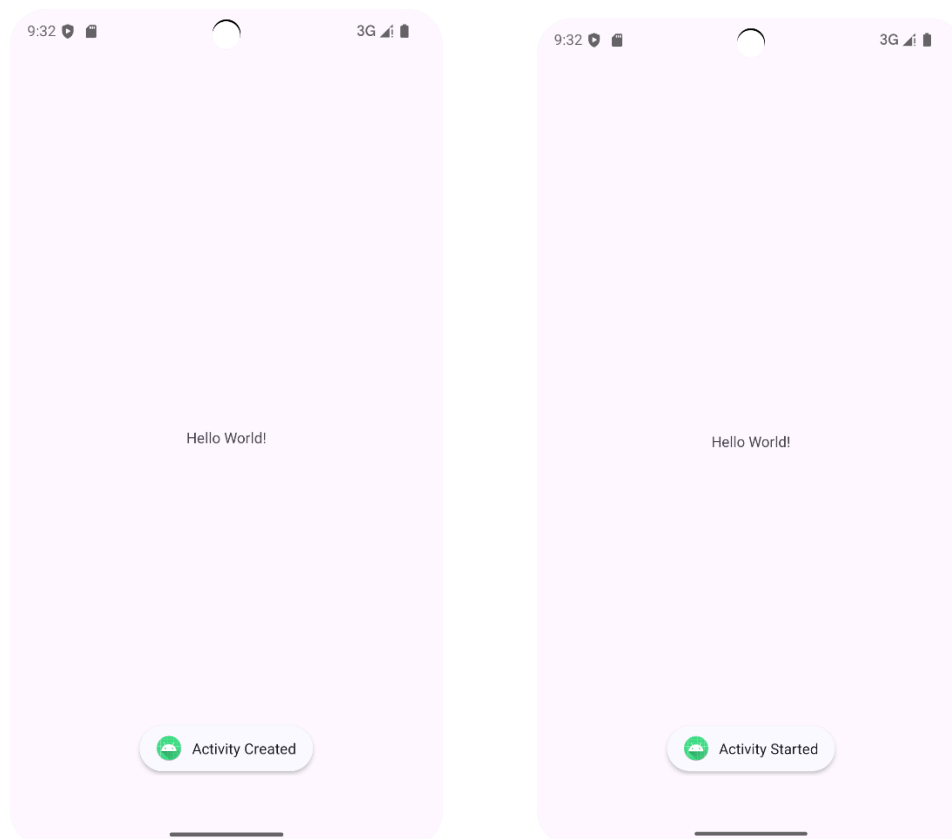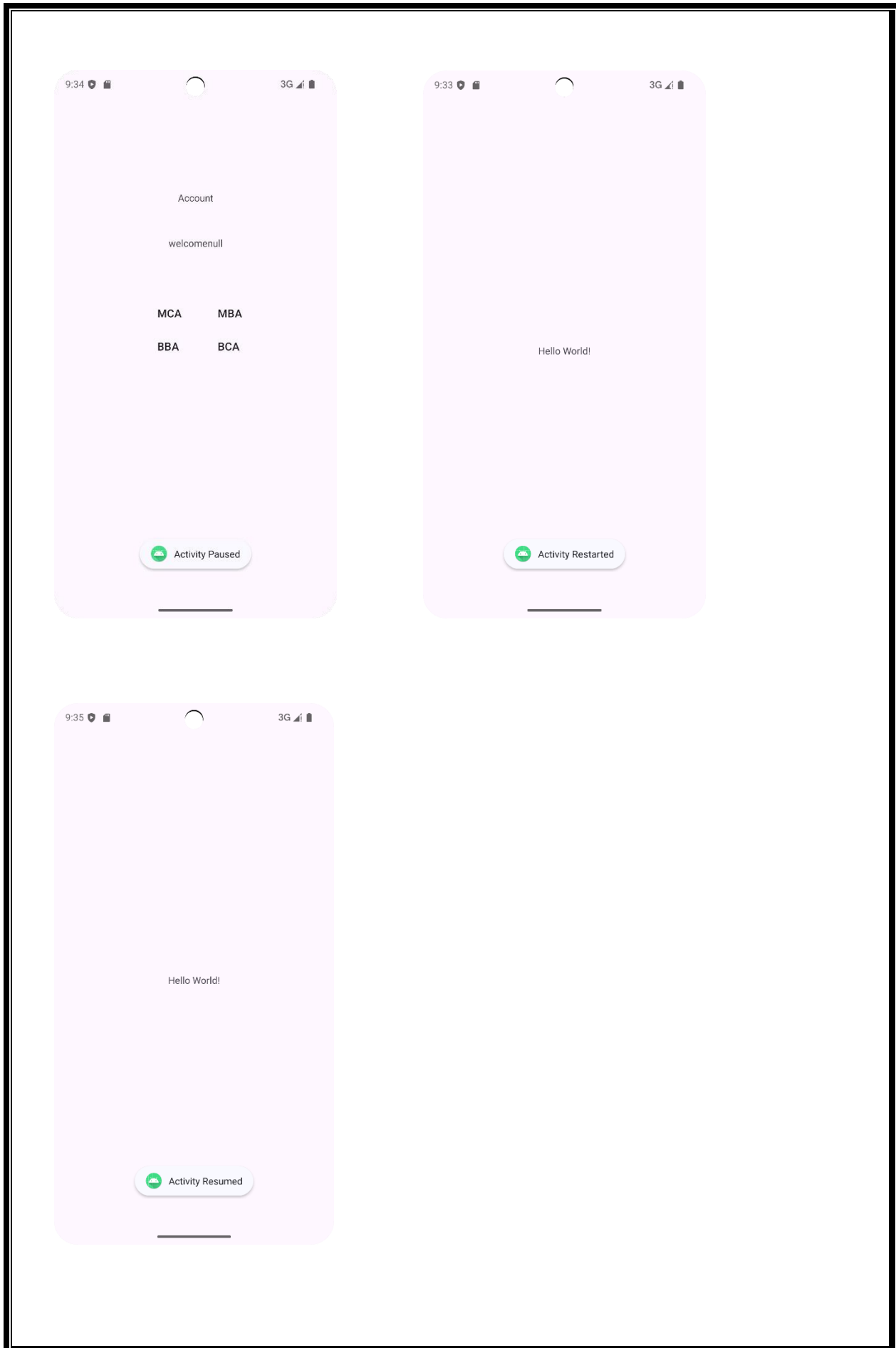
```
    }

  @Override
  protected void onRestart() {
    super.onRestart();
    Log.d(TAG, "onRestart called");
   Toast.makeText(this, "Activity Restarted", Toast.LENGTH_SHORT).show();
  }

  @Override
  protected void onDestroy() {
    super.onDestroy();
    Log.d(TAG, "onDestroy called");
   Toast.makeText(this, "Activity Destroyed", Toast.LENGTH_SHORT).show();
  }

}
```

Output :

PROGRAM 6:

Implementing basic arithmetic operations of a simple calculator

Code :

activity_main.xml:

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

<TextView
   android:id="@+id/t1"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_marginStart="25dp"
   android:layout_marginTop="236dp"
   android:layout_marginEnd="25dp"
   android:text="result"
   app:layout_constraintEnd_toStartOf="@+id/button2"
   app:layout_constraintHorizontal_bias="1.0"
   app:layout_constraintStart_toStartOf="parent"
   app:layout_constraintTop_toBottomOf="@+id/e2" />

<EditText
   android:id="@+id/e1"
   android:layout_width="wrap_content"
   android:layout_height="wrap_content"
   android:layout_marginStart="50dp"
   android:layout_marginTop="120dp"
   android:layout_marginEnd="50dp"
   android:ems="10"
   android:hint="enter number 1 :"
   app:layout_constraintEnd_toEndOf="parent"
   app:layout_constraintHorizontal_bias="0.504"
   app:layout_constraintStart_toStartOf="parent"
   app:layout_constraintTop_toTopOf="parent" />
```

```xml
<EditText
    android:id="@+id/e2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="50dp"
    android:layout_marginTop="20dp"
    android:layout_marginEnd="50dp"
    android:ems="10"
    android:hint="enter number 2 :"
    android:inputType="text"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/e1" />

<Button
    android:id="@+id/button"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="40dp"
    android:layout_marginEnd="20dp"
    android:text="+"
    android:onClick="add"
    app:layout_constraintEnd_toStartOf="@+id/button2"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toBottomOf="@+id/e2" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="40dp"
    android:layout_marginEnd="20dp"
    android:text="-"
    android:onClick="substract"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toEndOf="@+id/button"
    app:layout_constraintTop_toBottomOf="@+id/e2" />

<Button
    android:id="@+id/button3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
```

```xml
        android:layout_marginTop="36dp"
        android:layout_marginEnd="20dp"
        android:text="*"
        android:onClick="multiply"
        app:layout_constraintEnd_toStartOf="@+id/button4"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/button" />

     <Button
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="36dp"
        android:layout_marginEnd="20dp"
        android:text="/"
        android:onClick="divison"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/button3"
        app:layout_constraintTop_toBottomOf="@+id/button2" />

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

MainActivity.java:

```java
package com.example.calculator;

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

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 EditText o1;
    private EditText o2;
    private TextView tv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
```

```java
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);
        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;
        });
        o1 = findViewById(R.id.e1);
        o2 = findViewById(R.id.e2);
        tv = findViewById(R.id.t1);
    }

    public void add(View view) {
        String s1 = o1.getText().toString();
        String s2 = o2.getText().toString();
        float num1 = Float.parseFloat(s1);
        float num2 = Float.parseFloat(s2);
        float sum = num1 + num2;
        tv.setText("result : "+Float.toString(sum));
    }

    public void substract(View view) {
        String s1 = o1.getText().toString();
        String s2 = o2.getText().toString();
        float num1 = Float.parseFloat(s1);
        float num2 = Float.parseFloat(s2);
        float sub = num1 - num2;
        tv.setText("result : "+Float.toString(sub));
    }

    public void multiply(View view) {
        String s1 = o1.getText().toString();
        String s2 = o2.getText().toString();
        float num1 = Float.parseFloat(s1);
        float num2 = Float.parseFloat(s2);
        float mul = num1 * num2;
        tv.setText("result : "+Float.toString(mul));
    }

    public void divison(View view) {
        String s1 = o1.getText().toString();
        String s2 = o2.getText().toString();
        float num1 = Float.parseFloat(s1);
```
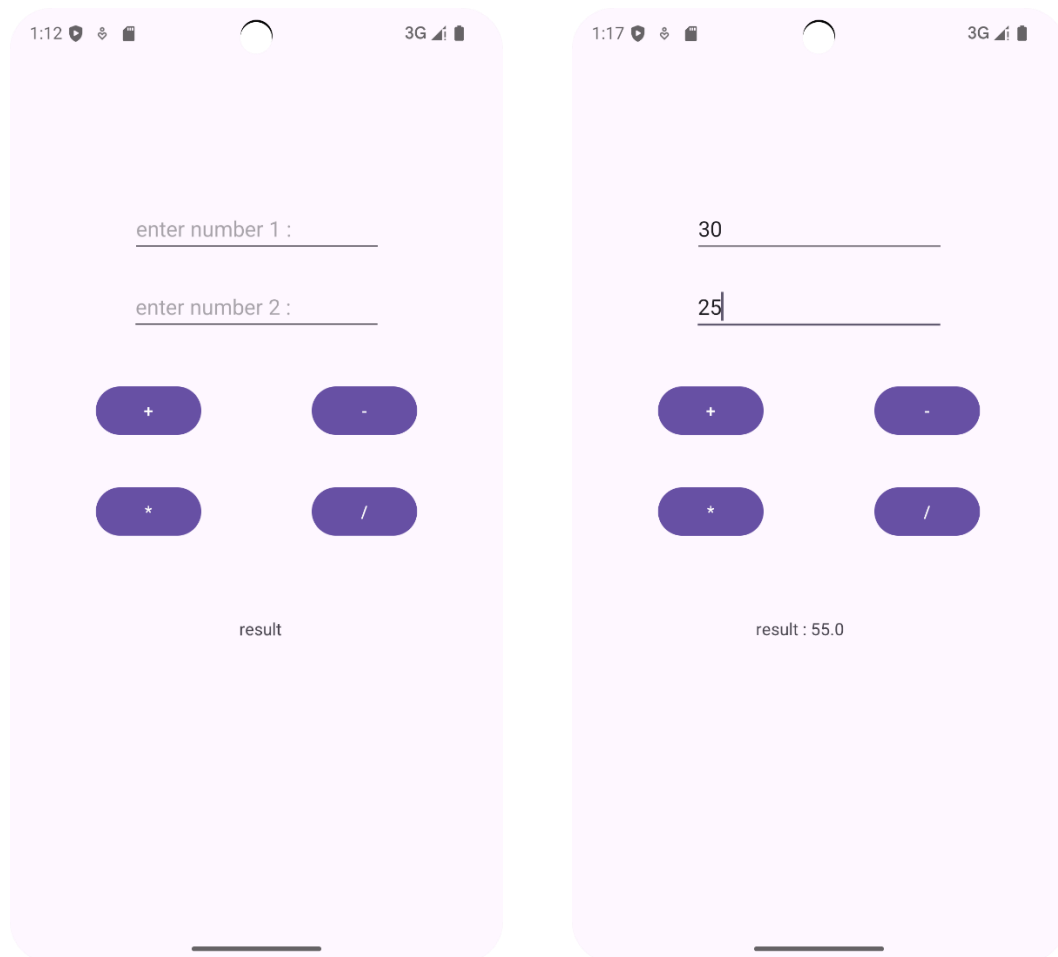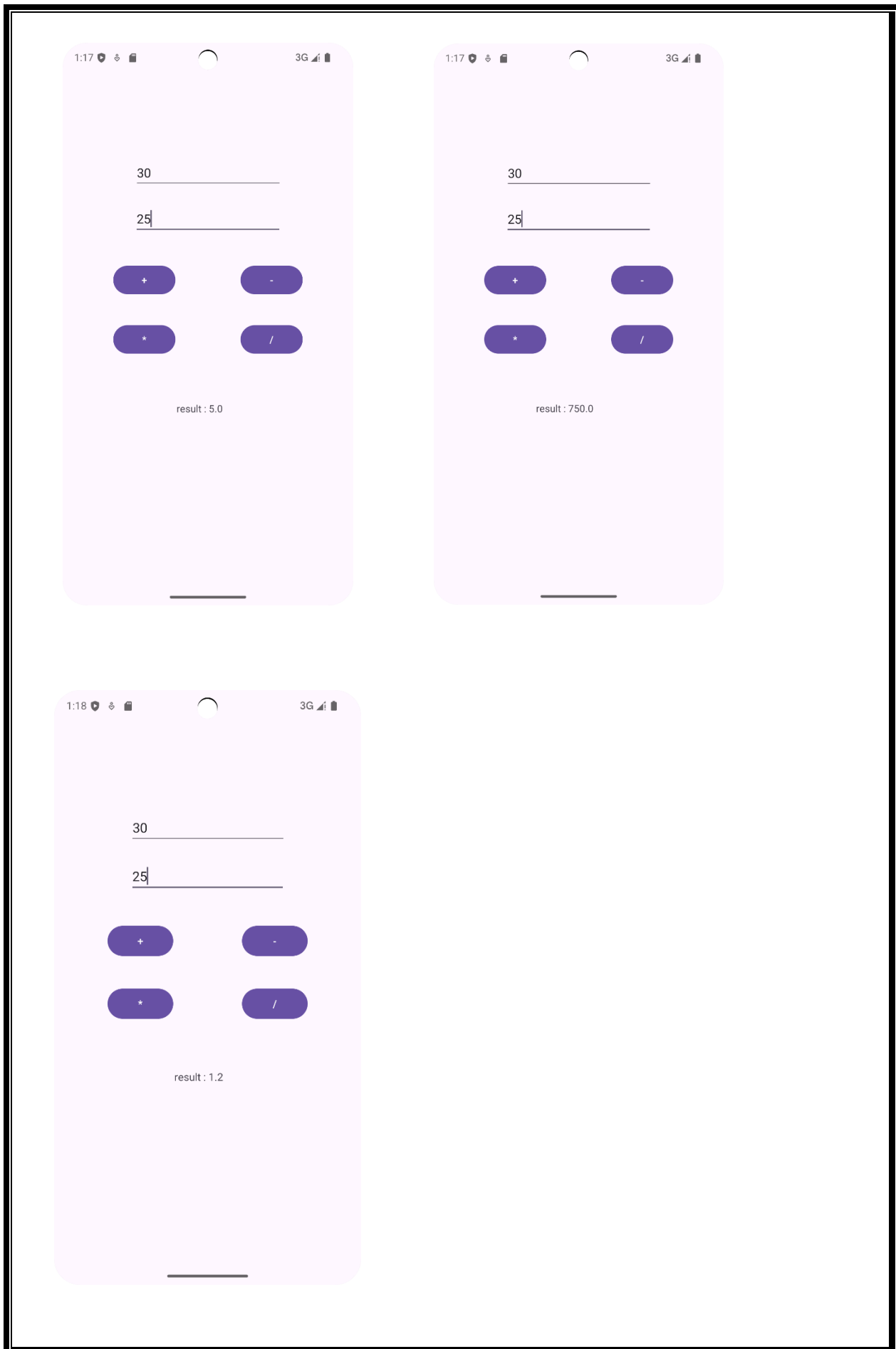
```
        float num2 = Float.parseFloat(s2);

        if (num2 != 0) {
            float div = num1 / num2;
            tv.setText("result : "+Float.toString(div));
        } else {
            tv.setText("Cannot divide by zero");
        }
    }
}
```

Output :

PROGRAM 7:

Implement Intent to navigate between multiple pages

Code :

activity_main.xml:

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

    <EditText
        android:id="@+id/ed1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="100dp"
        android:layout_marginEnd="20dp"
        android:ems="10"
        android:hint="Username"
        android:inputType="text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <EditText
        android:id="@+id/ed2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="20dp"
        android:ems="10"
        android:hint="Password"
        android:inputType="text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
```

```xml
            app:layout_constraintTop_toBottomOf="@+id/ed1" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="108dp"
        android:layout_marginTop="48dp"
        android:text="login"
        android:onClick="login"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed2" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="48dp"
        android:layout_marginEnd="112dp"
        android:text="cancel"
        android:onClick="cancel"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed2" />

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

MainActivity.java:

```java
package com.example.login;

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

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 EditText o1;
```

```java
    private EditText o2;
    private TextView v1;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

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;
    });
    o1 = findViewById(R.id.ed1);
    o2 =  findViewById(R.id.ed2);
  }

  public void login(View view) {
    String username = o1.getText().toString();
    String password = o2.getText().toString();
    if (isValidCredentials(username, password)) {
 Toast.makeText(this, "Login Successful", Toast.LENGTH_SHORT).show();
        Intent intent = new Intent(MainActivity.this,MainActivity2.class);
        intent.putExtra("USERNAME", username);
        startActivity(intent);
    } else {
 Toast.makeText(this, "Invalid credentials", Toast.LENGTH_SHORT).show();
    }
  }

  public void cancel(View view) {
    o1.setText("");
    o2.setText("");
  }

  private boolean isValidCredentials(String username, String password) {
    return username.equals("admin") && password.equals("1234");
  }
}
```

activity_main2.xml:

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

   <TextView
      android:id="@+id/e3"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginStart="79dp"
      android:layout_marginTop="80dp"
      android:text="TextView"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toTopOf="parent" />

   <Button
      android:id="@+id/b3"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginTop="80dp"
      android:layout_marginEnd="86dp"
      android:onClick="logout"
      android:text="logout"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintTop_toTopOf="parent" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity2.java:

```java
package com.example.login;

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

```java
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 MainActivity2 extends AppCompatActivity {
private TextView usernameDisplay;
private Button logoutButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main2);

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;
    });
    Intent intent = getIntent();
    String username = intent.getStringExtra("USERNAME");
    usernameDisplay = findViewById(R.id.e3);
    usernameDisplay.setText(username);

    // Set up the logout button
    logoutButton = findViewById(R.id.b3);
    logoutButton.setOnClickListener(this::logout);
  }

  public void logout(View view) {
    Intent intent = new Intent(MainActivity2.this, MainActivity.class);
    // Optional: Clear activity stack to ensure MainActivity is at the top
    intent.setFlags(Intent.FLAG_ACTIVITY_NEW_TASK |
    Intent.FLAG_ACTIVITY_CLEAR_TASK);
    startActivity(intent);
    finish();
  }
}
```

Output :
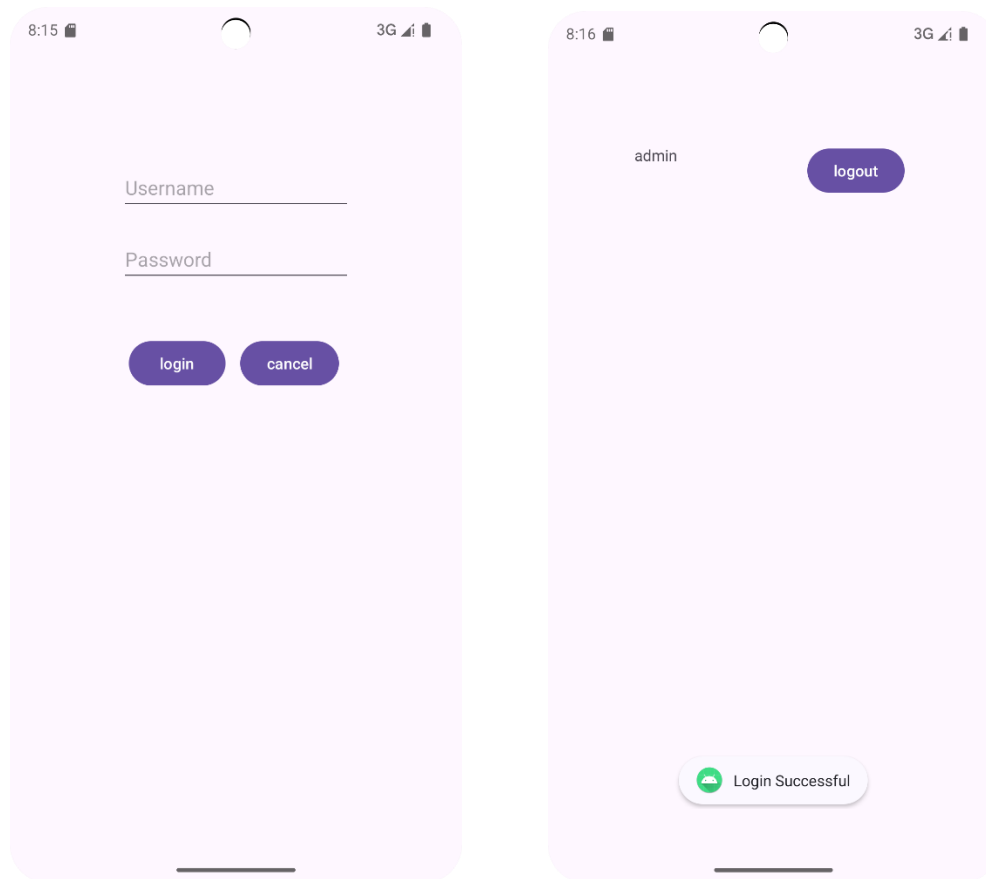
PROGRAM 8:

Design a registration activity and store registration details in local memory of phone using Intents and Shared Preferences

Code :

activity_main.xml:

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

    <EditText
        android:id="@+id/e1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="84dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter first name"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t1"
        app:layout_constraintTop_toTopOf="parent" />

    <TextView
        android:id="@+id/t2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="10dp"
        android:text="last name :"
        app:layout_constraintEnd_toStartOf="@+id/e2"
        app:layout_constraintHorizontal_bias="0.0"
        app:layout_constraintStart_toStartOf="parent"
```

```xml
        app:layout_constraintTop_toBottomOf="@+id/t1" />

    <EditText
        android:id="@+id/e2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="8dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter last name"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t2"
        app:layout_constraintTop_toBottomOf="@+id/e1" />

    <TextView
        android:id="@+id/t3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="60dp"
        android:layout_marginEnd="10dp"
        android:text="gender :"
        app:layout_constraintEnd_toStartOf="@+id/e2"
        app:layout_constraintHorizontal_bias="0.34"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/t2" />

    <EditText
        android:id="@+id/e4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="30dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter email id"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t4"
        app:layout_constraintTop_toBottomOf="@+id/radioGroup" />

    <TextView
        android:id="@+id/t4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="5dp"
```

```
        android:layout_marginTop="84dp"
        android:layout_marginEnd="10dp"
        android:text="email :"
        app:layout_constraintEnd_toStartOf="@+id/e4"
        app:layout_constraintHorizontal_bias="0.254"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/t3" />

    <TextView
        android:id="@+id/t5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="40dp"
        android:layout_marginTop="48dp"
        android:text="Phone No :"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/t4" />

    <EditText
        android:id="@+id/e5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter phone number"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t5"
        app:layout_constraintTop_toBottomOf="@+id/e4" />

    <TextView
        android:id="@+id/t6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="36dp"
        android:layout_marginEnd="10dp"
        android:text="password :"
        app:layout_constraintEnd_toStartOf="@+id/e4"
        app:layout_constraintHorizontal_bias="0.346"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/t5" />

    <EditText
        android:id="@+id/e6"
```

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter password"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t6"
        app:layout_constraintTop_toBottomOf="@+id/e5" />

    <TextView
        android:id="@+id/t7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="56dp"
        android:layout_marginEnd="20dp"
        android:text="Date of Birth"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.041"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/t6" />

    <EditText
        android:id="@+id/e7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="10dp"
        android:ems="10"
        android:hint="enter date of birth"
        android:inputType="date"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toEndOf="@+id/t7"
        app:layout_constraintTop_toBottomOf="@+id/e6" />

    <TextView
        android:id="@+id/t1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="10dp"
        android:layout_marginTop="100dp"
        android:layout_marginEnd="10dp"
        android:text="first name :"
```

```xml
        app:layout_constraintEnd_toStartOf="@+id/e1"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/b1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="128dp"
        android:layout_marginTop="40dp"
        android:layout_marginEnd="193dp"
        android:text="Register"
        android:onClick="register"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/e7" />

    <RadioGroup
        android:id="@+id/radioGroup"
        android:layout_width="232dp"
        android:layout_height="60dp"
        android:layout_marginStart="10dp"
        android:layout_marginTop="36dp"
        android:layout_marginEnd="10dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.882"
        app:layout_constraintStart_toEndOf="@+id/t3"
        app:layout_constraintTop_toBottomOf="@+id/e2">

        <RadioButton
            android:id="@+id/r1"
            android:layout_width="match_parent"
            android:layout_height="24dp"
            android:text="male" />

        <RadioButton
            android:id="@+id/r2"
            android:layout_width="match_parent"
            android:layout_height="36dp"
            android:text="female" />

    </RadioGroup>

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

MainActivity.java:

```java
package com.example.registration;

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.RadioButton;

import android.widget.RadioGroup;
import android.widget.Toast;


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 EditText firstNameEditText;
    private EditText lastNameEditText;
    private Button registerButton;
    private RadioGroup radioGroup;
    private EditText emailEditText;
    private EditText phoneNumberEditText;
    private EditText passwordEditText;
    private EditText dateOfBirthEditText;

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

        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;
        });

        firstNameEditText = findViewById(R.id.e1);
        lastNameEditText = findViewById(R.id.e2);
        registerButton = findViewById(R.id.b1);
        radioGroup = findViewById(R.id.radioGroup);
        emailEditText = findViewById(R.id.e4);
        phoneNumberEditText = findViewById(R.id.e5);
        passwordEditText = findViewById(R.id.e6);
        dateOfBirthEditText = findViewById(R.id.e7);
    }

    public void register(View view) {
        clearErrors();

        String firstName = firstNameEditText.getText().toString();
        String lastName = lastNameEditText.getText().toString();
        String email = emailEditText.getText().toString();
        String phoneNumber = phoneNumberEditText.getText().toString();
        String password = passwordEditText.getText().toString();
        String dateOfBirth = dateOfBirthEditText.getText().toString();

        boolean hasError = false;
        String selectedOption = null;

        if (firstName.isEmpty()) {
            firstNameEditText.setError("First Name is required");
            hasError = true;
        }
        if (lastName.isEmpty()) {
            lastNameEditText.setError("Last Name is required");
            hasError = true;
        }

        // Check if a gender is selected
        int selectedId = radioGroup.getCheckedRadioButtonId();
        if (selectedId == -1) {
    Toast.makeText(this, "Gender is required", Toast.LENGTH_SHORT).show();
            hasError = true;
        } else {
            RadioButton selectedRadioButton = findViewById(selectedId);
            selectedOption = selectedRadioButton.getText().toString();
        }

        // Validate email
```

```java
    if (email.isEmpty()) {
      emailEditText.setError("Email is required");
      hasError = true;
    } else if (!email.contains("@")) {
      emailEditText.setError("Email must contain '@'");
      hasError = true;
    }

    // Validate phone number
    if (phoneNumber.isEmpty()) {
      phoneNumberEditText.setError("Phone Number is required");
      hasError = true;
    } else if (!phoneNumber.matches("\\d+")) {
  // Check if phone number contains only digits
      phoneNumberEditText.setError("Phone Number must contain only
      digits");
      hasError = true;
    }

    // Validate password
    if (password.isEmpty()) {
      passwordEditText.setError("Password is required");
      hasError = true;
    }

    // Validate date of birth (assuming format YYYY)
    if (dateOfBirth.isEmpty()) {
      dateOfBirthEditText.setError("Date of Birth is required");
      hasError = true;
    }

    if (hasError) return;

    // Save to SharedPreferences
    SharedPreferences sharedPreferences =
    getSharedPreferences("UserPreferences", Context.MODE_PRIVATE);
    SharedPreferences.Editor editor = sharedPreferences.edit();
    editor.putString("FIRST_NAME", firstName);
    editor.putString("LAST_NAME", lastName);
    editor.putString("SELECTED_OPTION", selectedOption);
    // Store selected option text
    editor.putString("EMAIL", email);
    editor.putString("PHONE_NUMBER", phoneNumber);
    editor.putString("PASSWORD", password);
    editor.putString("DATE_OF_BIRTH", dateOfBirth);
    editor.apply();
```

```java
        // Start the next activity
        Intent intent = new Intent(MainActivity.this, MainActivity2.class);
        startActivity(intent);
    }

    private void clearErrors() {
        firstNameEditText.setError(null);
        lastNameEditText.setError(null);
        emailEditText.setError(null);
        phoneNumberEditText.setError(null);
        passwordEditText.setError(null);
        dateOfBirthEditText.setError(null);
    }
}
```

activity_main2.xml:

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

    <TextView
        android:id="@+id/l1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="153dp"
        android:layout_marginTop="137dp"
        android:layout_marginEnd="200dp"
        android:text="TextView"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

MainActivity2.java:

```java
package com.example.registration;

import android.content.Context;
import android.content.SharedPreferences;
import android.os.Bundle;
import android.widget.TextView;
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 MainActivity2 extends AppCompatActivity {
    private TextView displayNameTextView;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main2);

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;
        });

    displayNameTextView = findViewById(R.id.l1);
    SharedPreferences sharedPreferences =
    getSharedPreferences("UserPreferences", Context.MODE_PRIVATE);

    String firstName = sharedPreferences.getString("FIRST_NAME",
    "N/A");
    String lastName = sharedPreferences.getString("LAST_NAME", "N/A");
    String selectedOption =
    sharedPreferences.getString("SELECTED_OPTION", "N/A");
    String email = sharedPreferences.getString("EMAIL", "N/A");
    String phoneNumber =
    sharedPreferences.getString("PHONE_NUMBER", "N/A");
    String password = sharedPreferences.getString("PASSWORD", "N/A");
    String dateOfBirth = sharedPreferences.getString("DATE_OF_BIRTH",
```

"N/A");

displayNameTextView.setText("First Name: " +firstName + "\n"+"Last Name: " + lastName + "\n"+"Gender: " +selectedOption+ "\n" + "Email: " + email+ "\n" + "Phone Number: " + phoneNumber+ "\n" + "Password: " + password+ "\n" + "Date of Birth: " + dateOfBirth);
    }
}

Output :

12:09

First Name: Sreyas
Last Name: Satheesh
Gender: male
Email: sreyas@gmail.com
Phone Number: 7752365595
Password: sreyas@123
Date of Birth: 08-08-2003
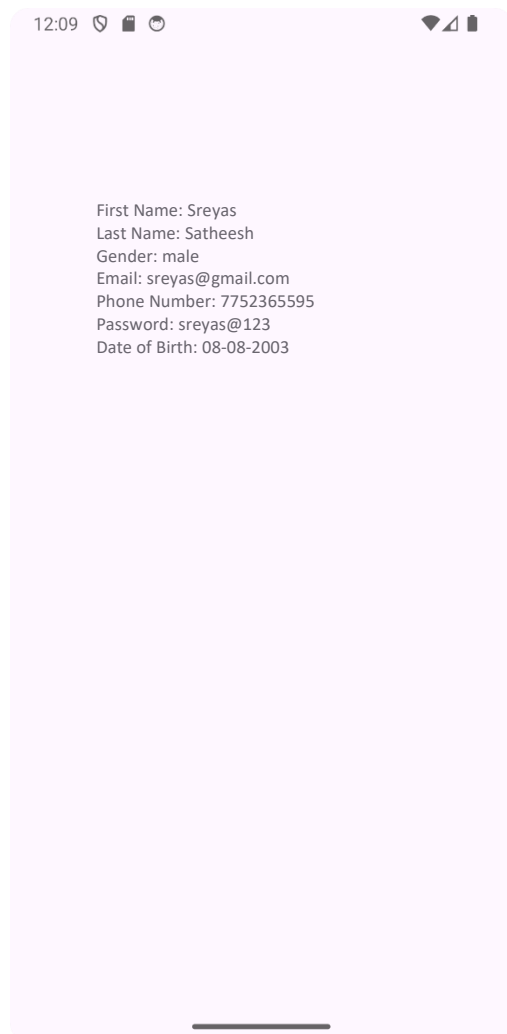
PROGRAM 9:

Write a program to open Facebook page on button click

Code :

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">

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="350dp"
        android:layout_marginEnd="20dp"
        android:onClick="fb"
        android:text="Click here"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

MainActivity.java:

```
package com.example.fb;

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;
```

```java
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);

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;
        });
    }

    public void fb(View view) {
        String url = "https://www.facebook.com/login/";

        Intent intent = new Intent(Intent.ACTION_VIEW, Uri.parse(url));
        startActivity(intent);
    }
}
```
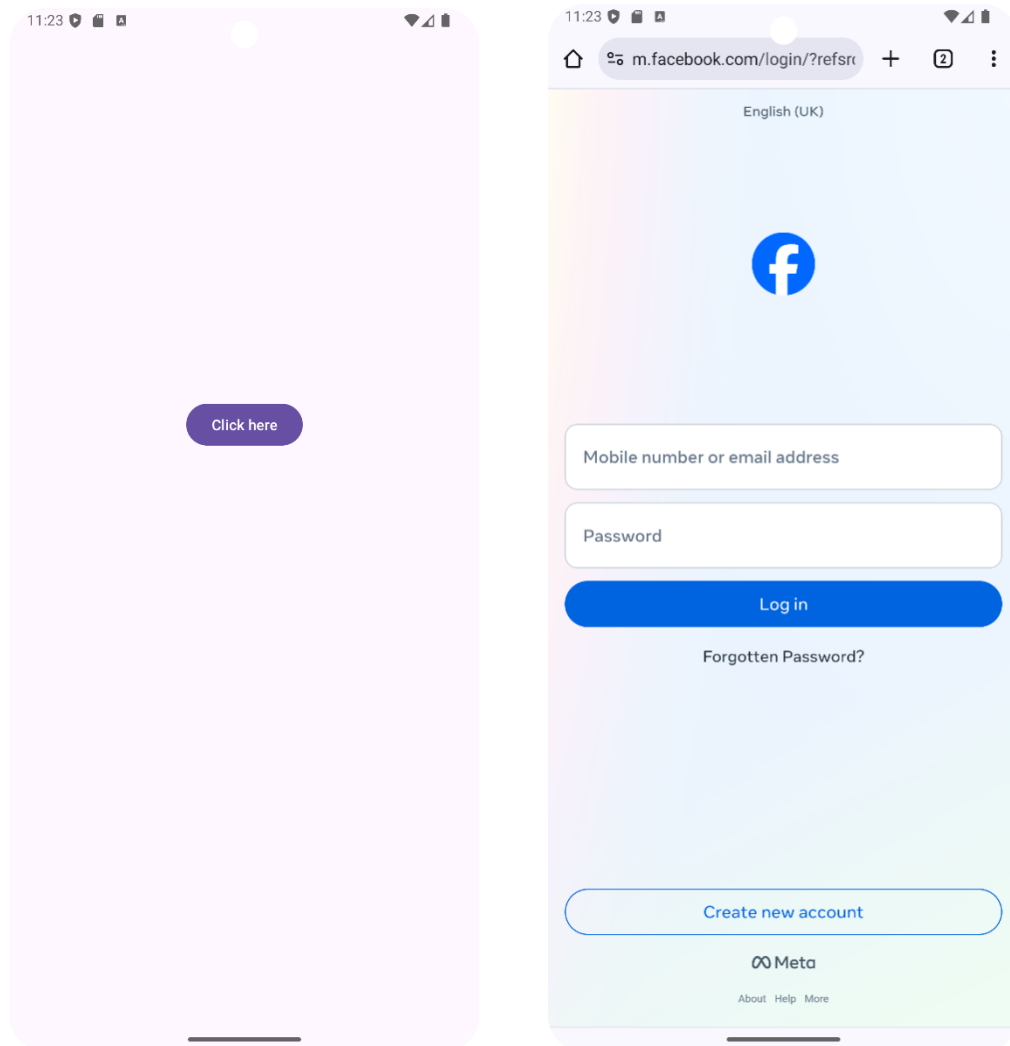
Output :

PROGRAM 10:

Design a Login Form with username and password using Linear Layout

Code :

activity_main.xml:

```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"
    android:orientation="vertical"
    android:gravity="center"
    tools:context=".MainActivity">
    <EditText
        android:id="@+id/username"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Username"
        android:layout_marginLeft="25dp"
        android:layout_marginRight="25dp"
        android:layout_marginBottom="20dp"
        android:inputType="text"/>

    <EditText
        android:id="@+id/password"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:hint="Password"
        android:layout_marginLeft="25dp"
        android:layout_marginRight="25dp"
        android:layout_marginTop="20dp"
        android:inputType="textPassword"/>

    <Button
        android:id="@+id/login_button"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="25dp"
        android:layout_marginRight="25dp"
```

```
                android:layout_marginTop="40dp"
                android:onClick="login"
                android:text="Login"/>



</LinearLayout>
```

**MainActivity.java:**

```java
package com.example.lin;

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 androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {
    private EditText o1;
    private EditText o2;
    private Button loginButton;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

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;
        });
        o1 = findViewById(R.id.username);
        o2 = findViewById(R.id.password);
        loginButton = findViewById(R.id.login_button);

    }
```

```
public void login(View view) {
    String username = o1.getText().toString();
    String password = o2.getText().toString();
    if (isValidCredentials(username, password)) {
Toast.makeText(this, "Login Successful", Toast.LENGTH_SHORT).show();
    } else {
Toast.makeText(this, "Invalid credentials", Toast.LENGTH_SHORT).show();
    }
}
private boolean isValidCredentials(String username, String password) {
    // Example validation: Replace with your own logic
    return username.equals("admin") && password.equals("1234");
}
}
```

Output :
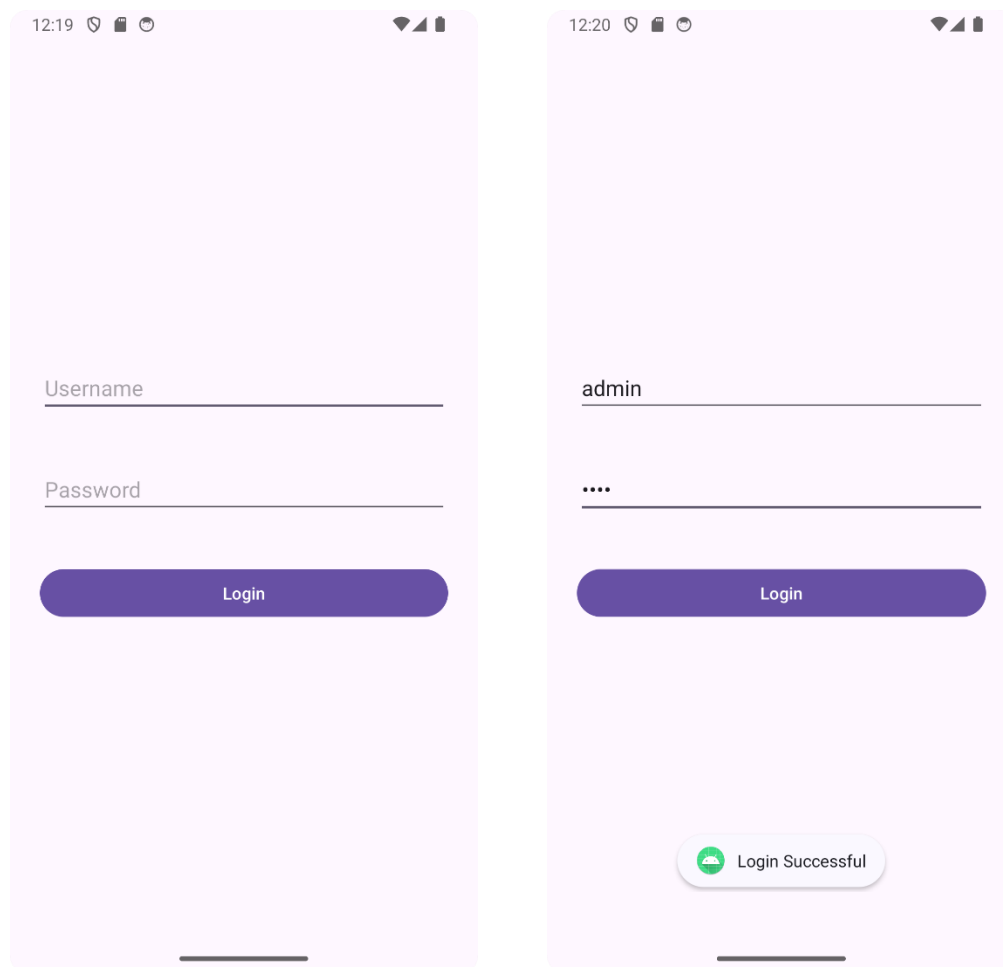
PROGRAM 11:

Design a Login Form with username and password using Relative Layout

Code :

activity_main.xml:

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


    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginLeft="40dp"
        android:layout_marginRight="40dp"
        android:hint="name"/>
    <EditText
        android:id="@+id/address"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginRight="10dp"
        android:layout_marginLeft="40dp"
        android:layout_below="@+id/name"
        android:hint="address"/>
    <EditText
        android:id="@+id/RollNo"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_below="@id/name"
        android:layout_marginLeft="20dp"
        android:layout_marginRight="90dp"
        android:layout_toRightOf="@id/address"
        android:hint="Roll No"/>
```

```xml
    <EditText
        android:id="@+id/PhNo"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_below="@id/address"
        android:layout_centerHorizontal="true"
        android:hint="Ph No"/>
</RelativeLayout>
```

MainActivity.java:

```java
package com.example.relative;

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 MainActivity extends AppCompatActivity {

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

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 :

PROGRAM 12:

Develop an application that uses ArrayAdapter with List View

Code :

activity_main.xml:

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

    <TextView
        android:id="@+id/e1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="50dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="50dp"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <ListView
        android:id="@+id/l1"
        android:layout_width="338dp"
        android:layout_height="186dp"
        android:layout_marginStart="50dp"
        android:layout_marginTop="51dp"
        android:layout_marginEnd="50dp"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/e1" />

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

```
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="50dp"
        android:layout_marginTop="267dp"
        android:layout_marginEnd="50dp"
        android:text="Account"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

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

MainActivity.java:

```java
package com.example.listview;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.ListView;
import android.widget.TextView;
import android.widget.Toast;

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 implements
AdapterView.OnItemClickListener {
    private TextView tv;
    private ListView lv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

    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;
    });
    tv=findViewById(R.id.e1);
    String msg=getIntent().getStringExtra("mykey");// receiving the data
    tv.setText("welcome " + msg);
    lv=findViewById(R.id.l1);// display(welcome changing to admin)
    // listview operation
    String[] courses={"MCA","MBA","BBA","BCA"};
    ArrayAdapter adapter = new ArrayAdapter(this,
    android.R.layout.simple_list_item_1,courses);
    lv.setAdapter(adapter);
    // attach listener
    lv.setOnItemClickListener(this);//implement the method by alt+enter
}

public void onItemClick(AdapterView<?> adapterView, View view, int i,
long l) {
    String itemname=lv.getItemAtPosition(i).toString();
    tv.setText("welcome " + itemname);
    Toast.makeText(this,itemname,Toast.LENGTH_SHORT).show();
}

}
```

Output :
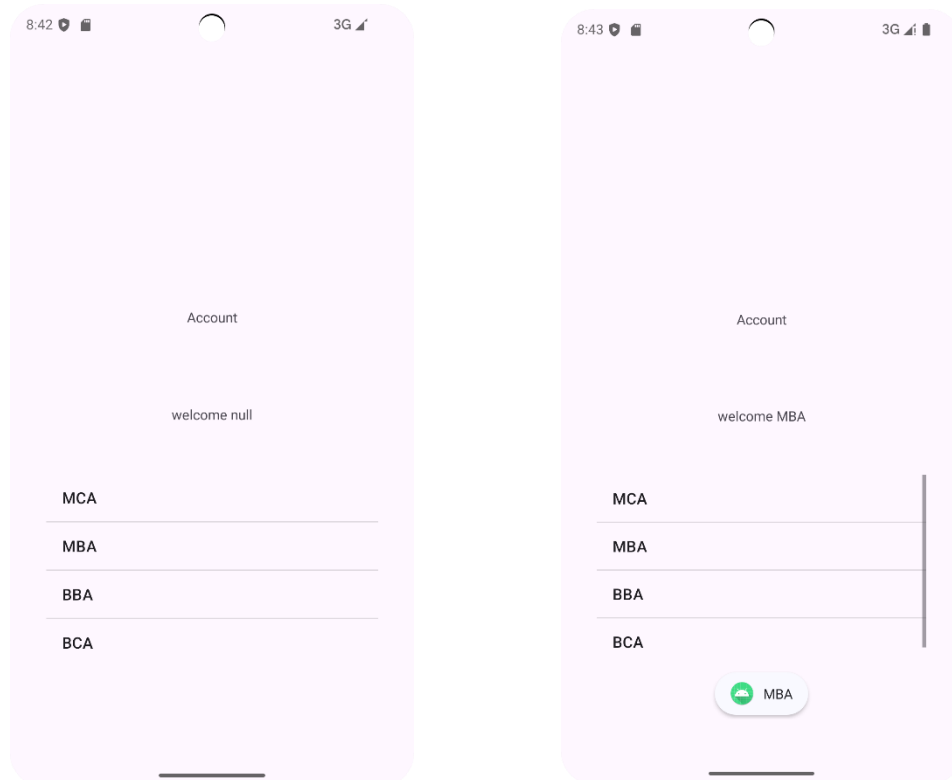
PROGRAM 13:

Develop an application that uses ArrayAdapter with Grid View

Code :

activity_main.xml:

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

    <TextView
        android:id="@+id/e1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="47dp"
        android:layout_marginEnd="20dp"
        android:layout_marginBottom="512dp"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/textView" />

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="134dp"
        android:layout_marginEnd="20dp"
        android:text="Account"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <GridView
```

```
        android:id="@+id/grid"
        android:layout_width="176dp"
        android:layout_height="353dp"
        android:layout_marginStart="20dp"
        android:layout_marginTop="68dp"
        android:layout_marginEnd="20dp"
        android:numColumns="2"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.584"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/e1" />

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

MainActivity.java:

```
package com.example.gridview;

import android.os.Bundle;
import android.view.View;
import android.widget.AdapterView;
import android.widget.ArrayAdapter;
import android.widget.GridView;
import android.widget.TextView;
import android.widget.Toast;

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 implements
AdapterView.OnItemClickListener {
    private TextView tv;
    private GridView gv;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_main);

    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;
    });
    tv=findViewById(R.id.e1);
    String msg=getIntent().getStringExtra("mykey");// receiving the data
    tv.setText("welcome"+msg);
    gv=findViewById(R.id.grid);// display(welcome changing to admin)
    // listviview operation
    String[] courses={"MCA","MBA","BBA","BCA"};
    ArrayAdapter adapter = new ArrayAdapter(this,
    android.R.layout.simple_list_item_1,courses);
    gv.setAdapter(adapter);
    // attach listener
    gv.setOnItemClickListener(this);
}
public void onItemClick(AdapterView<?> adapterView, View view, int i,
long l) {
    String itemname=gv.getItemAtPosition(i).toString();
    tv.setText("welcome "+itemname);
    Toast.makeText(this,itemname,Toast.LENGTH_SHORT).show();
}
}
```

Output :
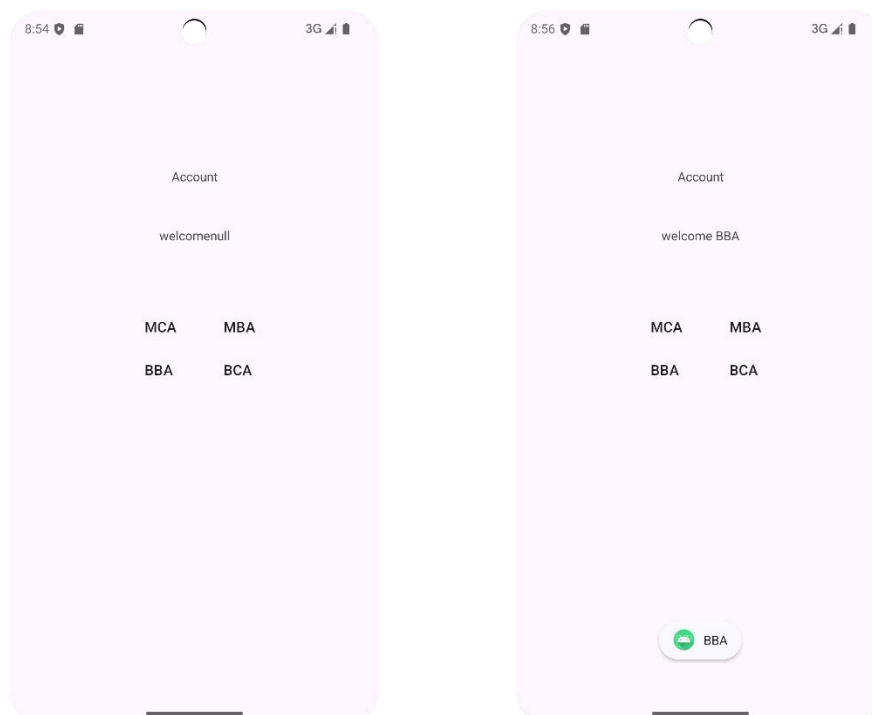
PROGRAM 14:

Create database using SQLite and perform INSERT, SELECT, UPDATE and DELETE

Code :

activity_main.xml:

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

<EditText
    android:id="@+id/ed1"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="20dp"
    android:layout_marginEnd="20dp"
    android:ems="10"
    android:hint="Name"
    android:inputType="text"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintTop_toTopOf="parent" />

<EditText
    android:id="@+id/ed2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginStart="20dp"
    android:layout_marginTop="20dp"
    android:layout_marginEnd="20dp"
    android:ems="10"
    android:hint="Surname"
    android:inputType="text"
```

```
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed1" />

    <EditText
        android:id="@+id/ed3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="20dp"
        android:layout_marginTop="20dp"
        android:layout_marginEnd="20dp"
        android:ems="10"
        android:hint="Marks"
        android:inputType="text"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed2" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="104dp"
        android:layout_marginTop="52dp"
        android:text="insert"
        android:onClick="SaveData"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed3" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="52dp"
        android:layout_marginEnd="104dp"
        android:text="Display"
        android:onClick="read"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/ed3" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="104dp"
        android:layout_marginTop="24dp"
```

```
      android:text="Update"
      android:onClick="update"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toBottomOf="@+id/button" />

  <Button
      android:id="@+id/button4"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginTop="24dp"
      android:layout_marginEnd="103dp"
      android:text="Delete"
      android:onClick="delete"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintTop_toBottomOf="@+id/button2" />

  <TextView
      android:id="@+id/textView"
      android:layout_width="wrap_content"
      android:layout_height="wrap_content"
      android:layout_marginStart="20dp"
      android:layout_marginTop="74dp"
      android:layout_marginEnd="20dp"
      android:text="Details"
      app:layout_constraintEnd_toEndOf="parent"
      app:layout_constraintStart_toStartOf="parent"
      app:layout_constraintTop_toBottomOf="@+id/button3" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

MainActivity.java:

```
package com.example.db;
import android.database.Cursor;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
import android.widget.Toast;

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 {
```

```java
   private EditText Name,Mark,Surname;
   private TextView DataV;
   MyDatabase database = new MyDatabase(this) ;
   @Override
   protected void onCreate(Bundle savedInstanceState) {
      super.onCreate(savedInstanceState);
      EdgeToEdge.enable(this);
      setContentView(R.layout.activity_main);

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;
      });
      Name = findViewById(R.id.ed1);
      Surname = findViewById(R.id.ed2);
      Mark = findViewById(R.id.ed3);
      DataV = findViewById(R.id.textView);
   }

   public void SaveData(View view) {
      String UserVal = Name.getText().toString();
      String SurnameVal = Surname.getText().toString();
      Integer PassVal = Integer.parseInt(Mark.getText().toString());
      Boolean result = database.insertdata(UserVal, PassVal,SurnameVal);
      if (result == true) {
        Toast.makeText(getApplicationContext(), "Data inserted Sucessfully",
            Toast.LENGTH_SHORT).show();
      } else {
        Toast.makeText(getApplicationContext(), "Data inserted failed",
            Toast.LENGTH_SHORT).show();
      }
   }

   public void update(View view) {
      String UserVal = Name.getText().toString();
      String SurnameVal = Surname.getText().toString();
      Integer PassVal = Integer.parseInt(Mark.getText().toString());
      Boolean result = database.updateData(UserVal, PassVal, SurnameVal);
      if (result==true){
        Toast.makeText(getApplicationContext(), "Data updated
            Successfully", Toast.LENGTH_SHORT).show();
        read(view);
```

```
        }
        else {
            Toast.makeText(getApplicationContext(), "No Rows Affected",
                    Toast.LENGTH_SHORT).show();
        }
    }
    public void delete(View view) {
        String UserVal = Name.getText().toString();
        int result=database.deletedata(UserVal);
        Toast.makeText(getApplicationContext(), "Data deleted Successfully",
                Toast.LENGTH_SHORT).show();
    }
    public void read(View view) {
        Cursor res = database.getAllData();
        StringBuffer stringBuffer = new StringBuffer();
        if (res != null && res.getCount() > 0) {
            while (res.moveToNext()) {
                stringBuffer.append("Id: " + res.getString(0) + "\n");
                stringBuffer.append("Name: " + res.getString(1) + "\n");
                stringBuffer.append("Surname: " + res.getString(2) + "\n");
                stringBuffer.append("marks: " + res.getString(3) + "\n");
            }
            DataV .setText(stringBuffer.toString());
        } else {
        Toast.makeText(getApplicationContext(), "Data Retrieved Successfully",
                Toast.LENGTH_SHORT).show();
        }
        Toast.makeText(getApplicationContext(), "Data Retrieved Successfully",
                Toast.LENGTH_SHORT).show();
    }
}
```

activity_my_database.xml:

```xml
<?xml version="1.0" encoding="utf-8"?>

<androidx.constraintlayout.widget.ConstraintLayout
xmlns:android="http://schemas.android.com/apk/res/android"
xmlns:app="http://schemas.android.com/apk/res-auto"
xmlns:tools="http://schemas.android.com/tools"
android:id="@+id/main"
android:layout_width="match_parent"
android:layout_height="match_parent"
tools:context=".MyDatabase">

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

MyDatabase.java

```java
package com.example.db;
import android.content.ContentValues;
import android.content.Context;
import android.database.Cursor;
import android.database.sqlite.SQLiteDatabase;
import android.database.sqlite.SQLiteOpenHelper;
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 MyDatabase extends SQLiteOpenHelper {

    public MyDatabase(Context context) {
        super(context, "Login.db", null, 1);
    }
    public void onCreate(SQLiteDatabase db) {
        db.execSQL("Create table USERS(ID INTEGER PRIMARY KEY
AUTOINCREMENT,NAME text,SURNAME text,MARKS INTEGER)");
    }

    public void onUpgrade(SQLiteDatabase db, int oldVersion, int newVersion)
{
        db.execSQL("DROP TABLE IF EXISTS USERS");
    }
    public Cursor getAllData() {
        SQLiteDatabase db=this.getWritableDatabase();
        Cursor res = db.rawQuery("Select * from USERS",null);
        return res;
    }
    public Boolean insertdata(String userVal, Integer passVal, String
surnameVal) {
        SQLiteDatabase db = this.getWritableDatabase();
        ContentValues contentValues = new ContentValues();
        contentValues.put("NAME", userVal);
        contentValues.put("SURNAME", surnameVal);
        contentValues.put("MARKS", passVal);
        long result = db.insert("USERS", null, contentValues);
        db.close();
```
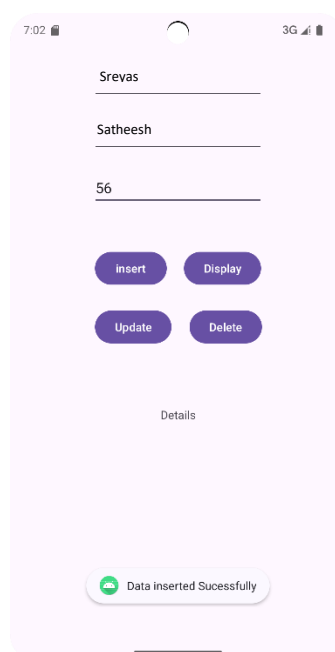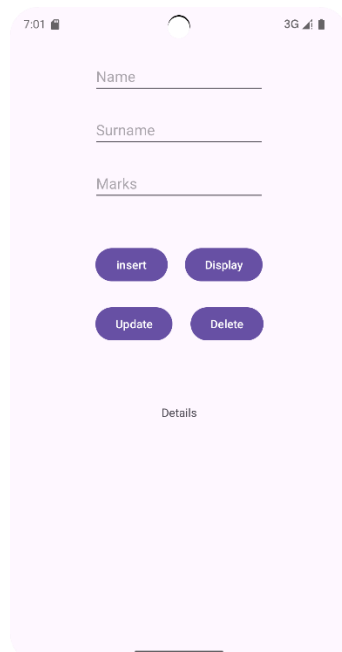
```
      if (result == -1) {
        return false;
      } else {
        return true;
      }
   }
   public int deletedata(String userVal) {
      SQLiteDatabase db=this.getWritableDatabase();
      int i =db.delete("USERS","NAME=?",new String[]{userVal});
      return i;
   }
   public Boolean updateData(String userVal, Integer passVal, String
surnameVal) {
      SQLiteDatabase db = this.getWritableDatabase();
      ContentValues contentValues = new ContentValues();
      contentValues.put("NAME", userVal);
      contentValues.put("SURNAME", surnameVal);
      contentValues.put("MARKS", passVal);
      int result = db.update("USERS", contentValues, "NAME=?", new
String[]{userVal});
      if (result > 0) {
        return true;
      } else {
        return false;
      }
   }
}
```

Output :