XML CODE

```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"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="130dp"
        android:layout_marginTop="30dp"
        android:text="login Page"
        android:textSize="30sp" />

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="40dp"
        android:layout_marginTop="40dp"
        android:text="user name" />

    <EditText
        android:id="@+id/editTextText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="200dp"
        android:layout_marginTop="-30dp"
        android:ems="10"
        android:inputType="text"
        android:text="Name" />

    <TextView
        android:id="@+id/textView3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginLeft="50dp"
        android:layout_marginTop="30dp"
        android:text="password" />
```
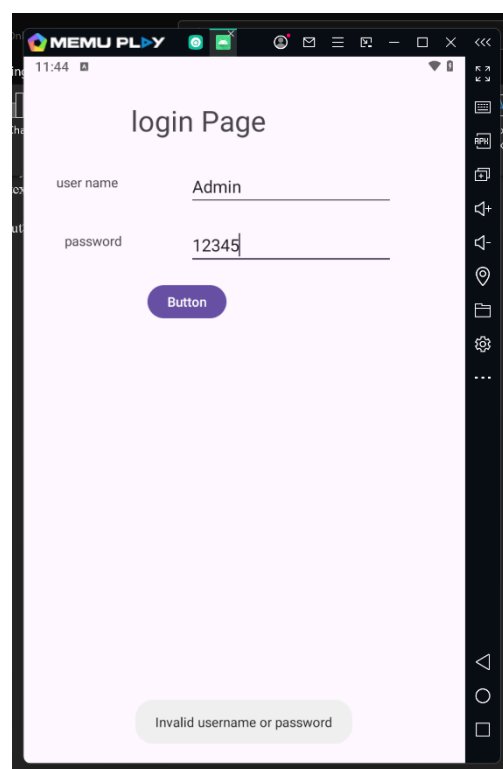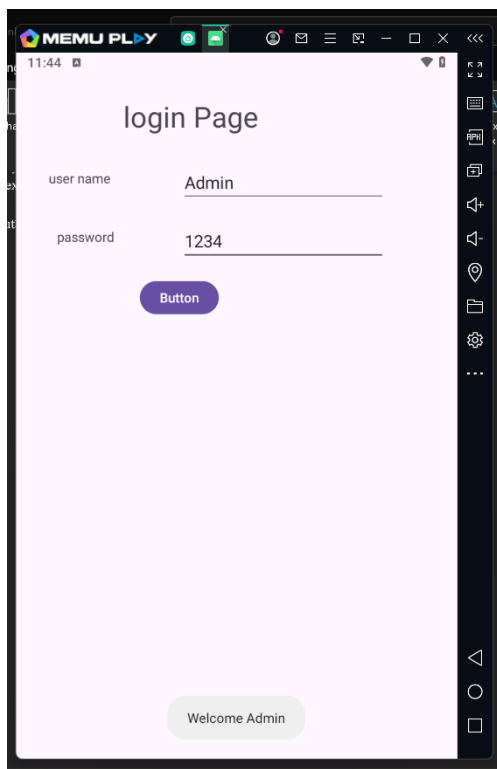
```xml
<EditText
    android:id="@+id/editTextText2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginLeft="200dp"
    android:layout_marginTop="-30dp"
    android:ems="10"
    android:inputType="text"
    android:text="Password" />

<Button
    android:id="@+id/button2"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:layout_marginLeft="150dp"
    android:layout_marginTop="20dp"
    android:text="Button" />

</LinearLayout>
```

OUTPUT

PROGRAM 1

<u>AIM</u>

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

<u>JAVA CODE</u>

```java
package com.example.loginpage;

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 {

    EditText e1, e2;
    Button 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;
        });

        e1 = findViewById(R.id.editTextText);
        e2 = findViewById(R.id.editTextText2);
        b1 = findViewById(R.id.button2);

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String username = e1.getText().toString();
                String password = e2.getText().toString();
```

```java
if (username.equals("Admin") && password.equals("1234")) {
Toast.makeText(MainActivity.this, "Welcome " + username, Toast.LENGTH_SHORT).show();
} else {
Toast.makeText(MainActivity.this, "Invalid username or password",Toast.LENGTH_SHORT).show();
        }
      }
    });
  }
}
```
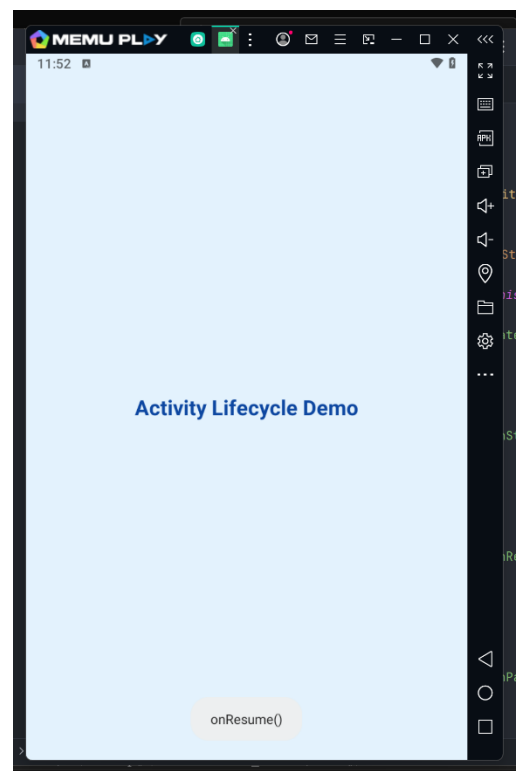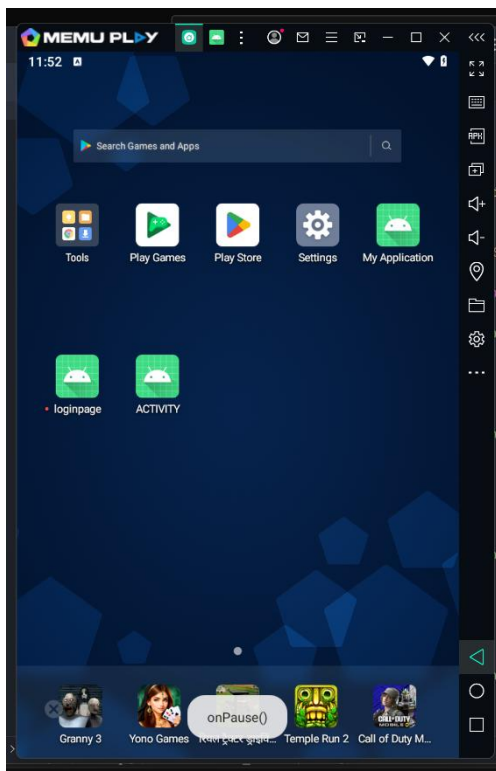
XML CODE

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:background="#E3F2FD">

    <TextView
        android:text="Activity Lifecycle Demo"
        android:textSize="22sp"
        android:textStyle="bold"
        android:textColor="#0D47A1"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content" />

</LinearLayout>
```

OUTPUT

PROGRAM 2

<u>AIM</u>

Write a program that demonstrates Activity Lifecycle

<u>JAVA CODE</u>

```java
package com.example.activitylifecycledemo;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.widget.Toast;

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        Toast.makeText(this, "onCreate()", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStart() {
        super.onStart();
        Toast.makeText(this, "onStart()", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onResume() {
        super.onResume();
        Toast.makeText(this, "onResume()", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onPause() {
        super.onPause();
        Toast.makeText(this, "onPause()", Toast.LENGTH_SHORT).show();
    }

    @Override
    protected void onStop() {
        super.onStop();
        Toast.makeText(this, "onStop()", Toast.LENGTH_SHORT).show();
    }
    @Override
    protected void onRestart() {
        super.onRestart();
        Toast.makeText(this, "onRestart()", Toast.LENGTH_SHORT).show();
    }
```

```java
    @Override
    protected void onDestroy() {
        super.onDestroy();
        Toast.makeText(this, "onDestroy()", Toast.LENGTH_SHORT).show();
    }
}
```

XML CODE

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/main"
    android:orientation="vertical"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:gravity="center"
    android:padding="24dp"
    android:background="#E3F2FD">

    <EditText
        android:id="@+id/num1"
        android:hint="Enter first number"
        android:inputType="numberDecimal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="10dp" />

    <EditText
        android:id="@+id/num2"
        android:hint="Enter second number"
        android:inputType="numberDecimal"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="20dp" />

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

        <Button
            android:id="@+id/add"
            android:text="+"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1" />

        <Button
            android:id="@+id/sub"
            android:text="-"
            android:layout_width="0dp"
            android:layout_height="wrap_content"
            android:layout_weight="1" />
```

```xml
    <Button
        android:id="@+id/mul"
        android:text="×"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1" />

    <Button
        android:id="@+id/div"
        android:text="÷"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:layout_weight="1" />
</LinearLayout>

<TextView
    android:id="@+id/result"
    android:text="Result: "
    android:textSize="20sp"
    android:textStyle="bold"
    android:textColor="#0D47A1"
    android:layout_marginTop="30dp"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content" />

</LinearLayout>
```
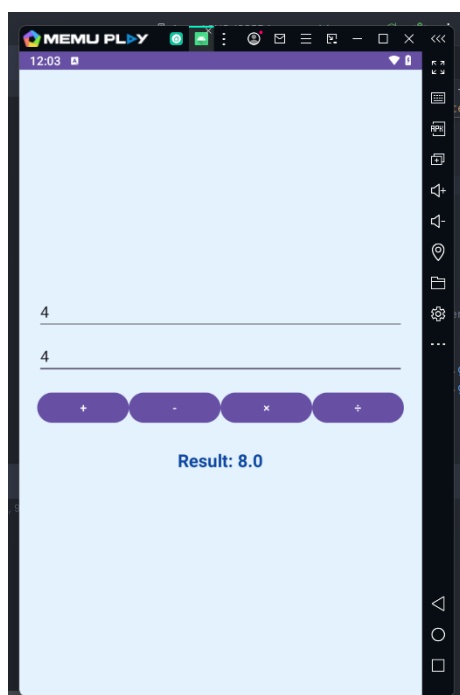
OUTPUT

PROGRAM 3

AIM

Implementing basic arithmetic operations of a simple calculator

JAVA CODE

```java
package com.example.simplecalculator;
import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.TextView;

public class MainActivity extends AppCompatActivity {

    EditText num1, num2;
    Button add, sub, mul, div;
    TextView result;

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




        num1 = findViewById(R.id.editNum1);
        num2 = findViewById(R.id.editNum2);
        add = findViewById(R.id.btnAdd);
        sub = findViewById(R.id.btnSub);
        mul = findViewById(R.id.btnMul);
        div = findViewById(R.id.btnDiv);
        result = findViewById(R.id.txtResult);

        add.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                double n1 = Double.parseDouble(num1.getText().toString());
                double n2 = Double.parseDouble(num2.getText().toString());
                double res = n1 + n2;
                result.setText("Result: " + res);
            }
        });
```

```java
sub.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        double n1 = Double.parseDouble(num1.getText().toString());
        double n2 = Double.parseDouble(num2.getText().toString());
        double res = n1 - n2;
        result.setText("Result: " + res);
    }
});

mul.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        double n1 = Double.parseDouble(num1.getText().toString());
        double n2 = Double.parseDouble(num2.getText().toString());
        double res = n1 * n2;
        result.setText("Result: " + res);
    }
});

div.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        double n1 = Double.parseDouble(num1.getText().toString());
        double n2 = Double.parseDouble(num2.getText().toString());

        if (n2 != 0) {
            double res = n1 / n2;
            result.setText("Result: " + res);
        } else {
            result.setText("Cannot divide by zero");
        }
    }
});
    }
}
```

XML CODE

```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/editTextText"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="text"
        android:text="user Name"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintVertical_bias="0.221" />

    <EditText
        android:id="@+id/editTextTextEmailAddress"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:text="email"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintVertical_bias="0.37" />

    <EditText
        android:id="@+id/editTextTextPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPassword"
        android:text="password"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
```

```xml
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintVertical_bias="0.602" />

    <EditText
        android:id="@+id/editTextPhone"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="phone"
        android:text="phone"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintVertical_bias="0.75" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintVertical_bias="0.85" />

    <com.google.android.material.chip.Chip
        android:id="@+id/chip2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Chip"
        app:layout_constraintTop_toBottomOf="@+id/button"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintTop_margin="16dp" />

</androidx.constraintlayout.widget.ConstraintLayout>
```
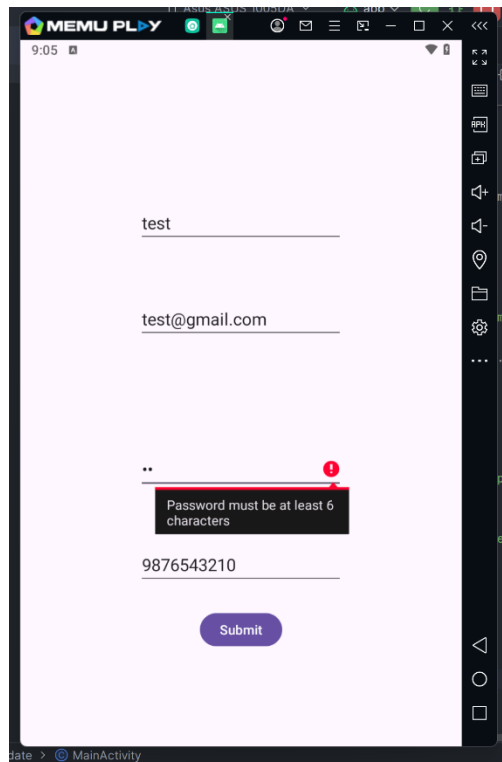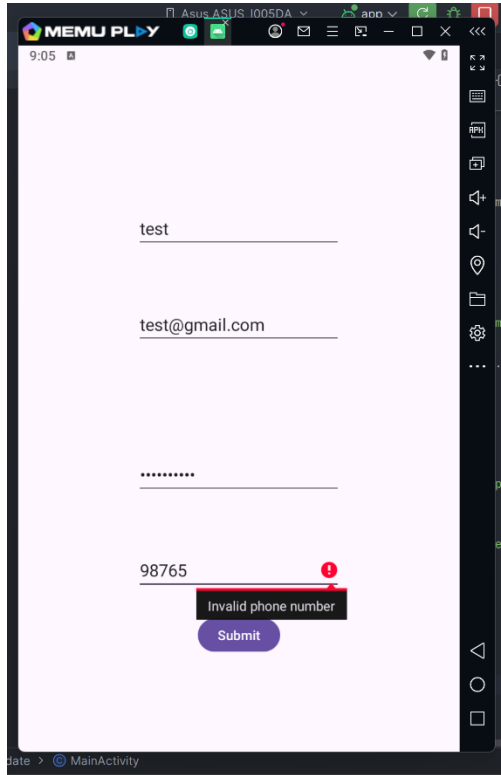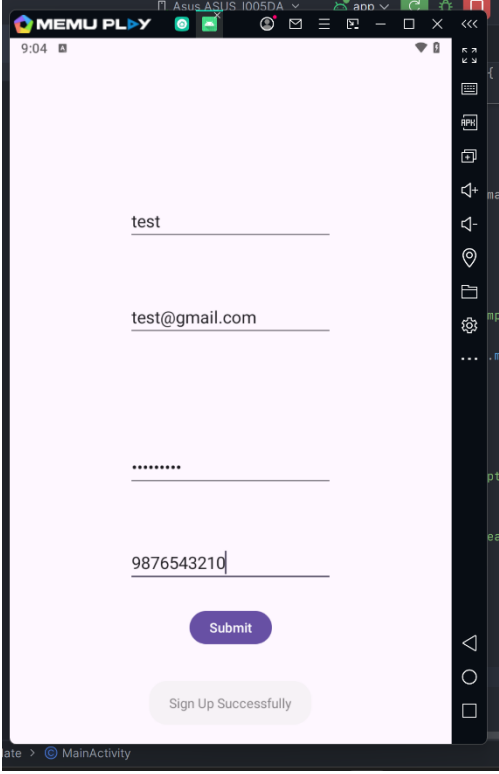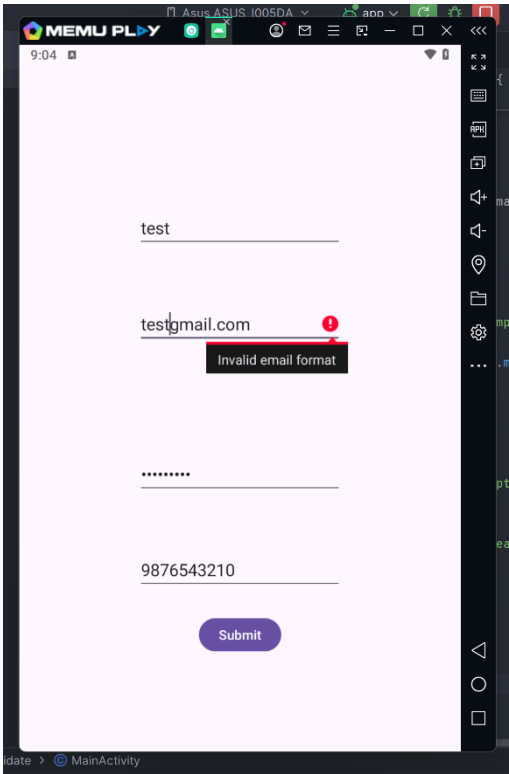
PROGRAM 4

AIM

Implement validations on various UI controls

JAVA CODE

```java
package com.example.validation;

import android.os.Bundle;
import android.util.Patterns;
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 {

    EditText username, password, email, phone;
    Button 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;
        });

        username = findViewById(R.id.editTextText);
        email = findViewById(R.id.editTextTextEmailAddress);
        phone = findViewById(R.id.editTextPhone);
        password = findViewById(R.id.editTextTextPassword);
        b1 = findViewById(R.id.button);

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
```

```java
            if (validation()) {
Toast.makeText(MainActivity.this, "Sign Up Successfully", Toast.LENGTH_SHORT).show();
            }
        }
    });
}

    private boolean validation() {
        boolean isValid = true;

        String userVar = username.getText().toString().trim();
        String emailVar = email.getText().toString().trim();
        String passwordVar = password.getText().toString();
        String phoneVar = phone.getText().toString().trim();

        if (userVar.isEmpty()) {
            username.setError("Username cannot be empty");
            isValid = false;
        }

        if (emailVar.isEmpty()) {
            email.setError("Email cannot be empty");
            isValid = false;
        } else if (!Patterns.EMAIL_ADDRESS.matcher(emailVar).matches()) {
            email.setError("Invalid email format");
            isValid = false;
        }

        if (phoneVar.isEmpty()) {
            phone.setError("Phone number cannot be empty");
            isValid = false;
        } else if (!Patterns.PHONE.matcher(phoneVar).matches() || phoneVar.length() < 10) {
            phone.setError("Invalid phone number");
            isValid = false;
        }

        if (passwordVar.isEmpty()) {
            password.setError("Password cannot be empty");
            isValid = false;
        } else if (passwordVar.length() < 6) {
            password.setError("Password must be at least 6 characters");
            isValid = false;
        }

        return isValid;
    }
}
```

XML CODE

```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/etName"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="text"
        android:text="Name"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintVertical_bias="0.233" />

    <EditText
        android:id="@+id/etEmail"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textEmailAddress"
        android:text="Email"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintVertical_bias="0.377" />

    <EditText
        android:id="@+id/etPassword"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:ems="10"
        android:inputType="textPassword"
        android:text="Password"
        app:layout_constraintTop_toTopOf="parent"
```

```
            app:layout_constraintBottom_toBottomOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintVertical_bias="0.5" />

    <Button
        android:id="@+id/btnSubmit"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Submit"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintVertical_bias="0.629" />

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

DISPLAY XML CODE

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

    <TextView
        android:id="@+id/tvDisplay"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="TextView"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.498"
        app:layout_constraintVertical_bias="0.278" />

    <TextView
        android:id="@+id/tvDisplay2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="TextView"
        app:layout_constraintTop_toTopOf="parent"
```
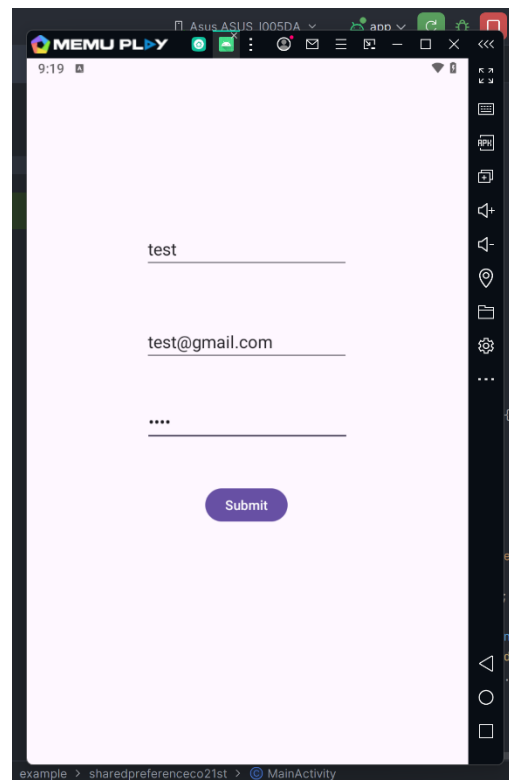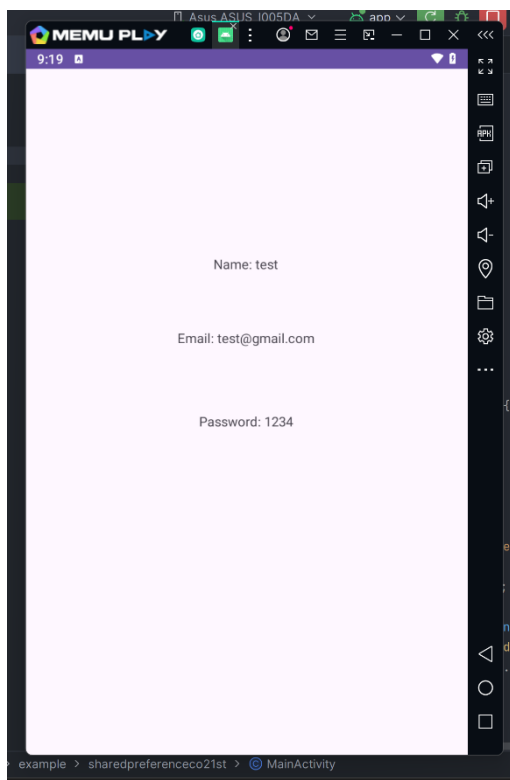
```
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintVertical_bias="0.389" />

<TextView
    android:id="@+id/tvDisplay3"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="TextView"
    app:layout_constraintTop_toTopOf="parent"
    app:layout_constraintBottom_toBottomOf="parent"
    app:layout_constraintStart_toStartOf="parent"
    app:layout_constraintEnd_toEndOf="parent"
    app:layout_constraintHorizontal_bias="0.498"
    app:layout_constraintVertical_bias="0.514" />

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

OUTPUT

PROGRAM 5

<u>AIM</u>

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

<u>JAVA CODE</u>

```java
package com.example.sharedpreferenceco21st;

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 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 {
    EditText etName, etEmail, etPassword;
    Button btnSubmit;

    @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;
        });

        etName = findViewById(R.id.etName);
        etEmail = findViewById(R.id.etEmail);
        etPassword = findViewById(R.id.etPassword);
        btnSubmit = findViewById(R.id.btnSubmit);

        btnSubmit.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                String name = etName.getText().toString();
                String email = etEmail.getText().toString();
```

```java
            String password = etPassword.getText().toString();

            SharedPreferences sp = getSharedPreferences("UserDetails", MODE_PRIVATE);
            SharedPreferences.Editor editor = sp.edit();
            editor.putString("Name", name);
            editor.putString("Email", email);
            editor.putString("Password", password);
            editor.apply();

            Intent intent = new Intent(MainActivity.this, DisplayActivity.class);
            intent.putExtra("Name", name);
            intent.putExtra("Email", email);
            startActivity(intent);
        }
    });
  }
}
```

DISPLAY CODE

```java
package com.example.sharedpreferenceco21st;

import android.content.SharedPreferences;
import android.os.Bundle;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class DisplayActivity extends AppCompatActivity {

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

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

    SharedPreferences sharedPref = getSharedPreferences("UserDetails", MODE_PRIVATE);

    String name = sharedPref.getString("Name", "DefaultName");
    String email = sharedPref.getString("Email", "DefaultEmail");
    String password = sharedPref.getString("Password", "DefaultPassword");
```

```java
        TextView tv = findViewById(R.id.tvDisplay);
        TextView tv1 = findViewById(R.id.tvDisplay2);
        TextView tv2 = findViewById(R.id.tvDisplay3);

        tv.setText("Name: " + name);
        tv1.setText("Email: " + email);
        tv2.setText("Password: " + password);
    }
}
```

XML CODE

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    android:gravity="center"
    android:background="#ECEFF1">

    <EditText
        android:id="@+id/display"
        android:layout_width="match_parent"
        android:layout_height="60dp"
        android:gravity="end"
        android:background="@android:color/white"
        android:inputType="none"
        android:hint="0"
        android:textSize="24sp"
        android:padding="10dp"
        android:focusable="false" />

    <GridLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:columnCount="4"
        android:rowCount="5"
        android:layout_marginTop="20dp"
        android:useDefaultMargins="true">

        <Button android:id="@+id/btn7" android:text="7"
            android:layout_width="0dp" android:layout_height="80dp"
            android:layout_columnWeight="1"/>

        <Button android:id="@+id/btn8" android:text="8"
            android:layout_width="0dp" android:layout_height="80dp"
            android:layout_columnWeight="1"/>

        <Button android:id="@+id/btn9" android:text="9"
            android:layout_width="0dp" android:layout_height="80dp"
            android:layout_columnWeight="1"/>

        <Button android:id="@+id/btnDiv" android:text="/"
            android:layout_width="0dp" android:layout_height="80dp"
            android:layout_columnWeight="1"/>
```

```xml
<Button android:id="@+id/btn4" android:text="4"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn5" android:text="5"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn6" android:text="6"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btnMul" android:text="*"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn1" android:text="1"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn2" android:text="2"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn3" android:text="3"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btnSub" android:text="-"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btn0" android:text="0"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btnClear" android:text="C"
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>

<Button android:id="@+id/btnEqual" android:text="="
    android:layout_width="0dp" android:layout_height="80dp"
    android:layout_columnWeight="1"/>
```
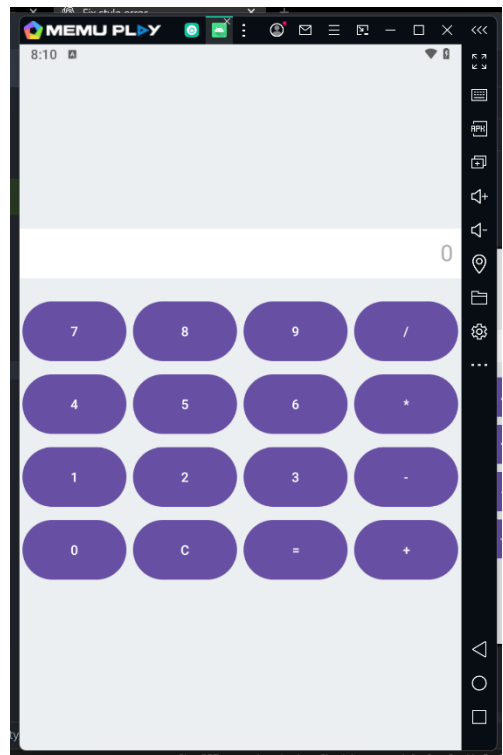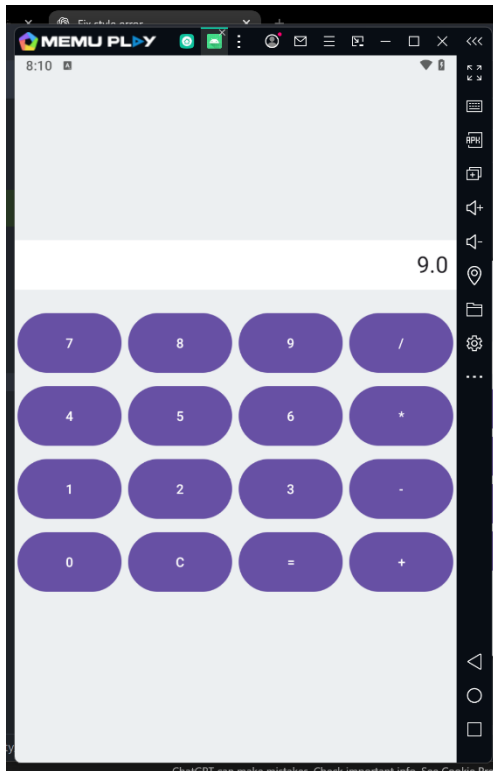
```xml
    <Button android:id="@+id/btnAdd" android:text="+"
        android:layout_width="0dp" android:layout_height="80dp"
        android:layout_columnWeight="1"/>

    </GridLayout>
</LinearLayout>
```

OUTPUT

PROGRAM 6

AIM

Design a simple Calculator using GridLayout and Cascaded LinearLayout

JAVA CODE

```java
package com.example.gridlayout;

import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
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 {
    EditText display;
    String currentInput = "";
    double firstNumber = 0;
    char operator = ' ';

    @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;
        });

        display = findViewById(R.id.display);
        display.setKeyListener(null);

        int[] numberIds = {
            R.id.btn0, R.id.btn1, R.id.btn2, R.id.btn3,
            R.id.btn4, R.id.btn5, R.id.btn6, R.id.btn7,
            R.id.btn8, R.id.btn9
        };
```

```java
    View.OnClickListener numberClick = v -> {
        Button b = (Button) v;
        currentInput += b.getText().toString();
        display.setText(currentInput);
    };

    for (int id : numberIds) {
        findViewById(id).setOnClickListener(numberClick);
    }

    findViewById(R.id.btnAdd).setOnClickListener(v -> handleOperator('+'));
    findViewById(R.id.btnSub).setOnClickListener(v -> handleOperator('-'));
    findViewById(R.id.btnMul).setOnClickListener(v -> handleOperator('*'));
    findViewById(R.id.btnDiv).setOnClickListener(v -> handleOperator('/'));
    findViewById(R.id.btnEqual).setOnClickListener(v -> calculateResult());
    findViewById(R.id.btnClear).setOnClickListener(v -> {
        currentInput = "";
        firstNumber = 0;
        operator = ' ';
        display.setText("");
    });
}

private void handleOperator(char op) {
    if (!currentInput.isEmpty()) {
        firstNumber = Double.parseDouble(currentInput);
        operator = op;
        currentInput = "";
        display.setText("");
    }
}

private void calculateResult() {
    if (!currentInput.isEmpty() && operator != ' ') {
        double secondNumber = Double.parseDouble(currentInput);
        double result = 0;
        switch (operator) {
            case '+': result = firstNumber + secondNumber; break;
            case '-': result = firstNumber - secondNumber; break;
            case '*': result = firstNumber * secondNumber; break;
            case '/':
                if (secondNumber == 0) {
                    display.setText("Error");
                    return;
                }
                result = firstNumber / secondNumber;
```

```
                break;
        }
        display.setText(String.valueOf(result));
        currentInput = String.valueOf(result);
        operator = ' ';
    }
  }
}
```

PROGRAM 7

<u>AIM</u>

Create a Facebook page using RelativeLayout; set properties using .xml file

<u>XML CODE</u>

```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="#FFFFFF"
    android:padding="20dp">

    <TextView
        android:id="@+id/fbTitle"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="facebook"
        android:textColor="#1877F2"
        android:textStyle="bold"
        android:textSize="36sp"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="80dp" />

    <EditText
        android:id="@+id/editTextEmail"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@id/fbTitle"
        android:layout_marginTop="80dp"
        android:hint="Email or Phone"
        android:inputType="textEmailAddress"
        android:padding="10dp"
        android:background="@drawable/edittext_background"
        android:textSize="16sp" />
    <EditText
        android:id="@+id/editTextPassword"
        android:layout_width="match_parent"
        android:layout_height="50dp"
        android:layout_below="@id/editTextEmail"
        android:layout_marginTop="15dp"
        android:hint="Password"
        android:inputType="textPassword"
        android:padding="10dp"
        android:background="@drawable/edittext_background"
        android:textSize="16sp" />
```

```xml
<Button
    android:id="@+id/btnLogin"
    android:layout_width="match_parent"
    android:layout_height="50dp"
    android:layout_below="@id/editTextPassword"
    android:layout_marginTop="20dp"
    android:text="Log In"
    android:textAllCaps="false"
    android:textSize="18sp"
    android:textColor="#FFFFFF"
    android:backgroundTint="#1877F2" />

<TextView
    android:id="@+id/forgotPassword"
    android:layout_width="wrap_content"
    android:layout_height="wrap_content"
    android:text="Forgotten password?"
    android:textColor="#1877F2"
    android:textSize="15sp"
    android:layout_below="@id/btnLogin"
    android:layout_centerHorizontal="true"
    android:layout_marginTop="15dp" />

<View
    android:id="@+id/divider"
    android:layout_width="match_parent"
    android:layout_height="1dp"
    android:background="#BDBDBD"
    android:layout_below="@id/forgotPassword"
    android:layout_marginTop="30dp"
    android:layout_marginBottom="30dp" />

<Button
    android:id="@+id/btnSignup"
    android:layout_width="wrap_content"
    android:layout_height="50dp"
    android:text="Create new account"
    android:textAllCaps="false"
    android:textSize="16sp"
    android:textColor="#FFFFFF"
    android:backgroundTint="#42B72A"
    android:layout_below="@id/divider"
    android:layout_centerHorizontal="true"
    android:paddingStart="25dp"
    android:paddingEnd="25dp"
    android:layout_marginTop="10dp" />
</RelativeLayout>
```
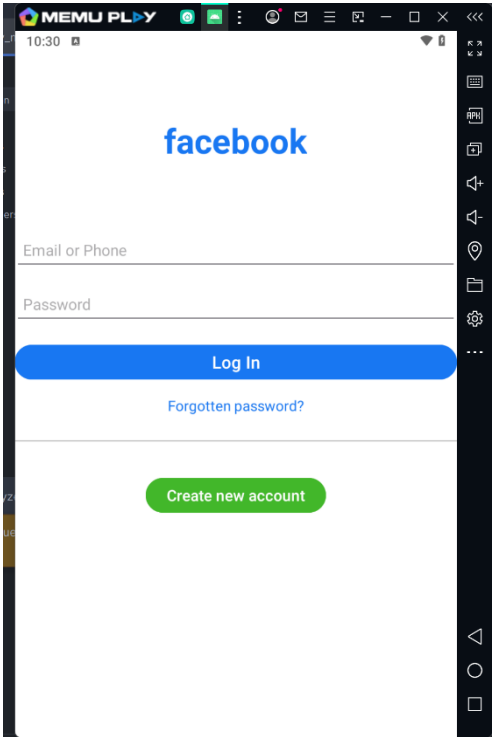
XML CODE
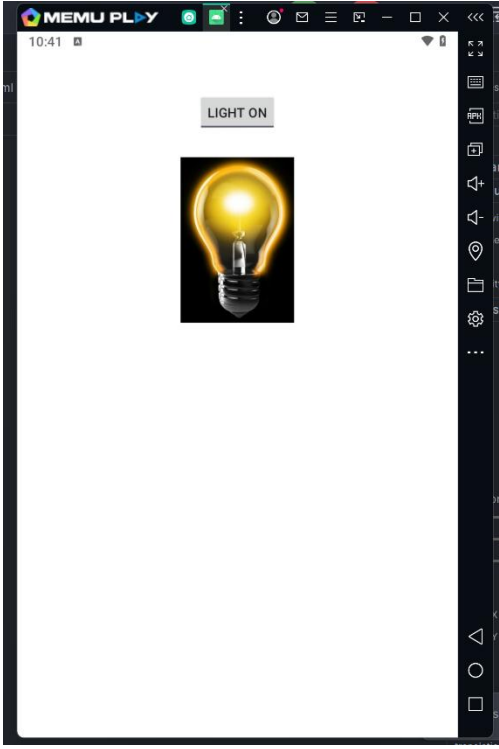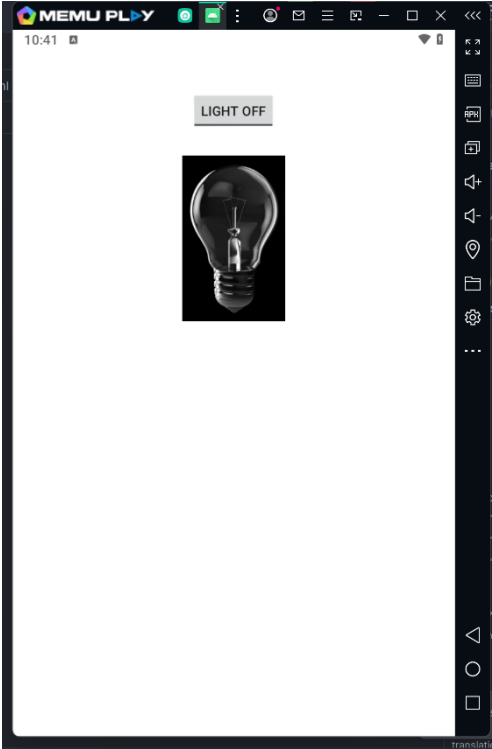
```xml
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp"
    android:background="#FFFFFF">

    <ToggleButton
        android:id="@+id/toggleButton2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:textOn="Light ON"
        android:textOff="Light OFF"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="50dp" />

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:layout_below="@id/toggleButton2"
        android:layout_centerHorizontal="true"
        android:layout_marginTop="30dp"
        android:src="@drawable/lightoff"
        android:contentDescription="Light bulb image" />

</RelativeLayout>
```

PROGRAM 8

AIM
Develop an application that toggles image using FrameLayout

JAVA CODE

```java
package com.example.toggle;

import android.os.Bundle;
import android.widget.ImageView;
import android.widget.ToggleButton;

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 {
    ToggleButton tb;
    ImageView iv;

    @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;
        });

        tb = findViewById(R.id.toggleButton2);
        iv = findViewById(R.id.imageView);

        tb.setOnCheckedChangeListener((buttonView, isChecked) -> {
            if (isChecked) {
                iv.setImageResource(R.drawable.lighton);
            } else {
                iv.setImageResource(R.drawable.lightoff);
            }
        });
    }
}
```

XML CODE

```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="219dp"
        android:layout_height="60dp"
        android:text="AWH"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.505"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.347" />

    <Button
        android:id="@+id/button2"
        android:layout_width="221dp"
        android:layout_height="60dp"
        android:text="validation"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/button3"
        android:layout_width="234dp"
        android:layout_height="58dp"
        android:text="Whatsapp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.497"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.632" />

</androidx.constraintlayout.widget.ConstraintLayout>
```
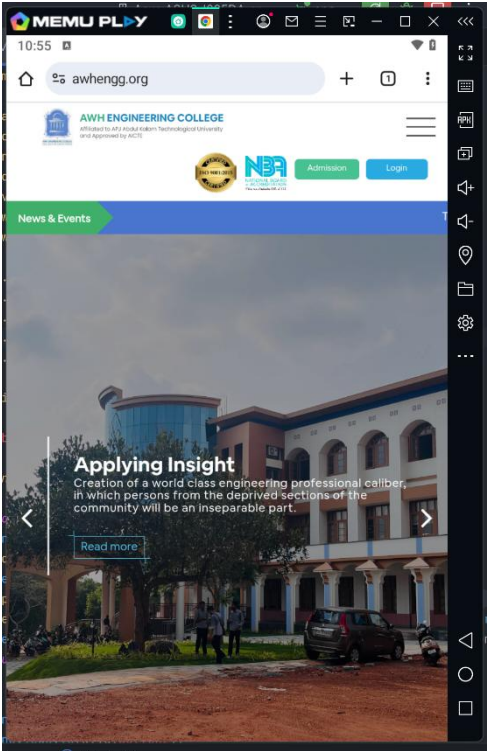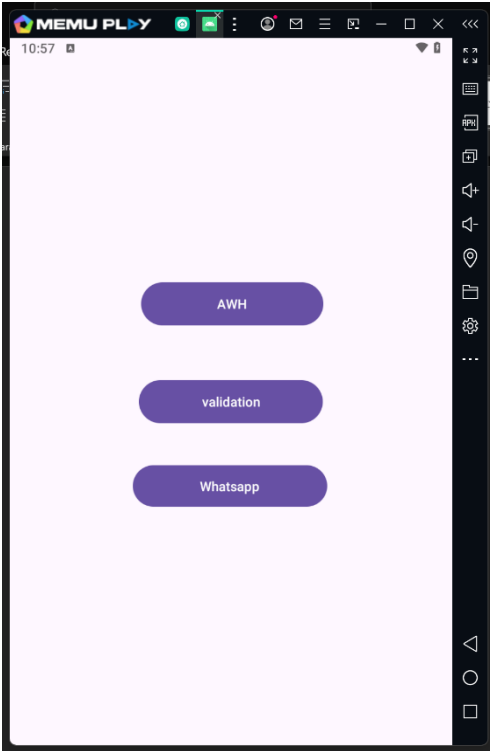
PROGRAM 9

AIM

Implement Intent to navigate between multiple activities

JAVA CODE

```java
package com.example.implicitintent;

import android.annotation.SuppressLint;
import android.content.Intent;
import android.net.Uri;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
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 {
    Button b1, b2, b3;

    @SuppressLint("MissingInflatedId")
    @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;
        });

        b1 = findViewById(R.id.button);
        b2 = findViewById(R.id.button2);
        b3 = findViewById(R.id.button3);

        b1.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(Intent.ACTION_VIEW);
                intent.setData(Uri.parse("https://awhengg.org/"));
                startActivity(intent);
```

```java
            }
        });


        b2.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent launchIntent =
getPackageManager().getLaunchIntentForPackage("com.example.validation");
                if (launchIntent != null) {
                    startActivity(launchIntent);
                } else {
                    Toast.makeText(MainActivity.this, "App Not Installed",
Toast.LENGTH_SHORT).show();
                }
            }
        });


        b3.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent launchIntent1 =
getPackageManager().getLaunchIntentForPackage("com.android.vending");
                if (launchIntent1 != null) {
                    startActivity(launchIntent1);
                } else {
                    Toast.makeText(MainActivity.this, "App Not Installed",
Toast.LENGTH_SHORT).show();
                }
            }
        });
    }
}
```

XML CODE

```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"
    android:id="@+id/main"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="16dp">

    <TextView
        android:id="@+id/tvHeading"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="First Page"
        android:textSize="28sp"
        android:textStyle="bold"
        android:textColor="#000000"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        android:layout_marginBottom="32dp"/>

    <Button
        android:id="@+id/btnNext"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Go to Second Page"
        app:layout_constraintTop_toBottomOf="@id/tvHeading"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

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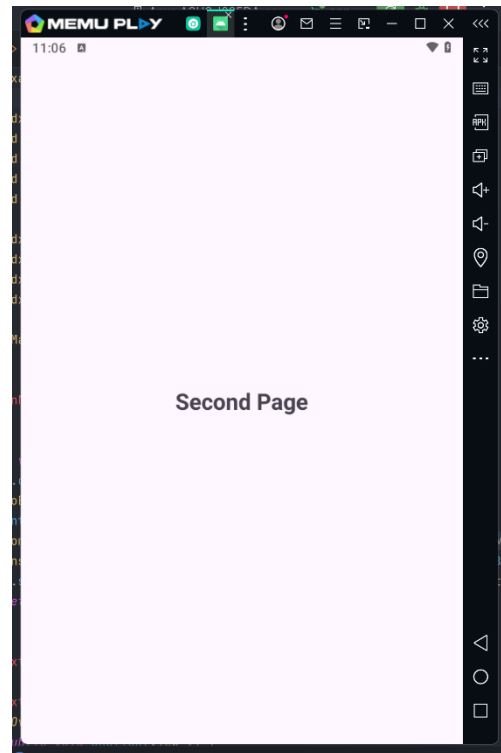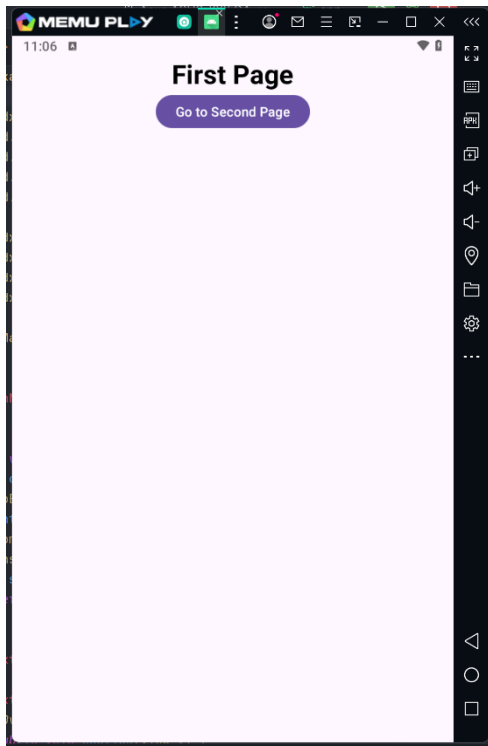
DISPLAY XML

```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"
    android:id="@+id/display"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <TextView
        android:id="@+id/tvSecondPage"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="Second Page"
        android:textSize="24sp"
        android:textStyle="bold"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintEnd_toEndOf="parent" />

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

OUTPUT

PROGRAM 10

<u>AIM</u>

Develop application that works with explicit intents

<u>JAVA CODE</u>

```java
package com.example.explicit;

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

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

public class MainActivity extends AppCompatActivity {

    Button btnNext;

    @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;
        });

        btnNext = findViewById(R.id.btnNext);

        btnNext.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Intent intent = new Intent(MainActivity.this, SecondActivity.class);
                startActivity(intent);
            }
        });
    }
}
```

DISPLAY CODE

```java
package com.example.explicit;

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

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

public class SecondActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.activity_display);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.display), (v, insets) -> {
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });

        TextView tvDisplay = findViewById(R.id.tvDisplay);
        tvDisplay.setText("Second Page");
    }
}
```

XML CODE

```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.appcompat.widget.Toolbar
        android:id="@+id/toolbar"
        android:layout_width="413dp"
        android:layout_height="64dp"
        android:background="?attr/colorPrimary"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.005"
        app:title="My Toolbar"
        app:titleTextColor="@android:color/white" />

    <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>
```

HOME CODE

```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/menu_home"
    android:layout_width="match_parent"
    android:layout_height="match_parent">
```

```xml
    <TextView
        android:id="@+id/textView"
        android:layout_width="252dp"
        android:layout_height="34dp"
        android:text="HOME PAGE"
        android:textSize="30sp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.748"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.114" />

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

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

    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="PROFILE PAGE"
        tools:layout_editor_absoluteX="125dp"
        tools:layout_editor_absoluteY="179dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

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

    <TextView
        android:id="@+id/textViewSettings"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="SETTINGS PAGE"
```

```xml
        android:textSize="24sp"
        android:textStyle="bold"
        android:layout_marginTop="40dp"
        tools:layout_editor_absoluteX="140dp"
        tools:layout_editor_absoluteY="100dp" />

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

LOGOUT CODE

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

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

MENU CODE

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

    <item
        android:id="@+id/menu_home"
        android:title="Home" />

    <item
        android:id="@+id/menu_profile"
        android:title="Profile" />

    <item
        android:id="@+id/menu_settings"
        android:title="Settings" />

    <item
        android:id="@+id/option_menu"
        android:title="Logout" />

</menu>
```
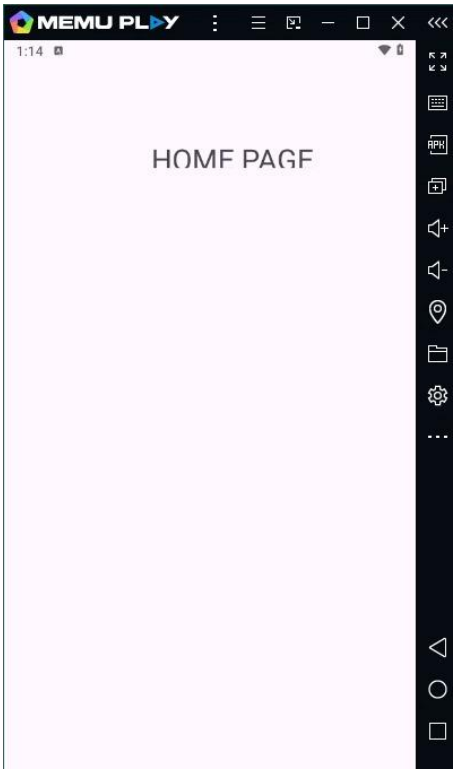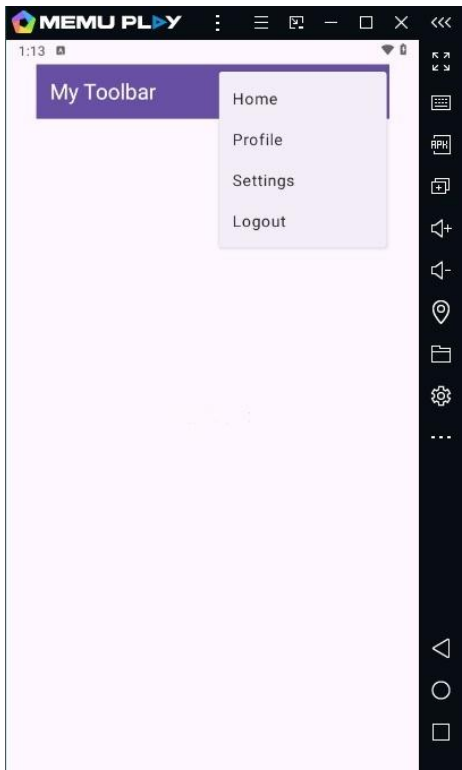
PROGRAM 11

<u>AIM</u>

Implement Options Menu to navigate to activities

<u>JAVA CODE</u>

```java
package com.example.optionmenu;

import android.content.Intent;
import android.os.Bundle;
import android.view.Menu;
import android.view.MenuItem;
import android.widget.Toast;

import androidx.appcompat.widget.Toolbar;
import androidx.appcompat.app.AppCompatActivity;
import androidx.activity.EdgeToEdge;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        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;
        });

        Toolbar toolbar = findViewById(R.id.toolbar);
        setSupportActionBar(toolbar);
    }

    @Override
    public boolean onCreateOptionsMenu(Menu menu) {
        getMenuInflater().inflate(R.menu.options_menu, menu);
        return true;
    }

    @Override
    public boolean onOptionsItemSelected(MenuItem item) {
        switch (item.getItemId()) {
```

```java
            case R.id.menu_home:
                startActivity(new Intent(this, HomeActivity.class));
                return true;
            case R.id.menu_profile:
                startActivity(new Intent(this, ProfileActivity.class));
                return true;
            case R.id.menu_settings:
                startActivity(new Intent(this, SettingsActivity.class));
                return true;
            case R.id.option_menu:
                Toast.makeText(this, "Logged out", Toast.LENGTH_SHORT).show();
                return true;
            default:
                return super.onOptionsItemSelected(item);
        }
    }
}
```

HOME CODE

```java
package com.example.optionmenu;

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 HomeActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.menu_home);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.menu_home), (v, insets) ->
{
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });
    }
}
```

PROFILE CODE

```java
package com.example.optionmenu;

import android.os.Bundle;
```

```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 ProfileActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.menu_profile);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.menu_profile), (v, insets) ->
{
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });
    }
}
```

SETTING CODE

```java
package com.example.optionmenu;

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 SettingsActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        EdgeToEdge.enable(this);
        setContentView(R.layout.menu_settings);
        ViewCompat.setOnApplyWindowInsetsListener(findViewById(R.id.menu_settings), (v, insets) ->
{
            Insets systemBars = insets.getInsets(WindowInsetsCompat.Type.systemBars());
            v.setPadding(systemBars.left, systemBars.top, systemBars.right, systemBars.bottom);
            return insets;
        });
    }
}
```

XML CODE

```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">

    <ListView
        android:id="@+id/listview1"
        android:layout_width="409dp"
        android:layout_height="729dp"
        app:layout_constraintTop_toTopOf="parent"
        tools:layout_editor_absoluteX="1dp" />
</androidx.constraintlayout.widget.ConstraintLayout>
```
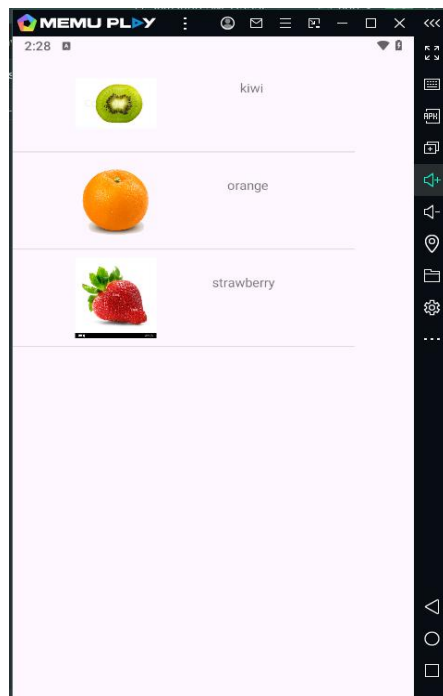
LISTVIEW CODE

```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">

    <ImageView
        android:id="@+id/imageView"
        android:layout_width="97dp"
        android:layout_height="123dp"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.24"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.235"
        tools:srcCompat="@tools:sample/avatars" />
    <TextView
        android:id="@+id/textView2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
```

```
        android:text="TextView"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.713"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent"
        app:layout_constraintVertical_bias="0.304" />
</androidx.constraintlayout.widget.ConstraintLayout>
```

OUTPUT

PROGRAM 12

<u>AIM</u>

Develop an application that uses ArrayAdapter with ListView

<u>JAVA CODE</u>

```java
package com.example.fruit_adapter;

import android.os.Bundle;
import android.widget.ListView;
import android.widget.SimpleAdapter;

import androidx.activity.EdgeToEdge;
import androidx.appcompat.app.AppCompatActivity;
import androidx.core.graphics.Insets;
import androidx.core.view.ViewCompat;
import androidx.core.view.WindowInsetsCompat;

import java.util.ArrayList;
import java.util.HashMap;
import java.util.Objects;

public class MainActivity extends AppCompatActivity {

    ListView listView;
    String[] fruits_name = {
            "kiwi","orange","strawberry"
    };
    int[] list_fruit_image= {
            R.drawable.kiwi,
            R.drawable.orange,
            R.drawable.strawberry
    } ;


    @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;
        });
        listView=findViewById(R.id.listview1);
        ArrayList<HashMap<String,Object>> list=new ArrayList<>();
```

```java
        for (int i=0;i<fruits_name.length;i++){
            HashMap<String,Object> map =new HashMap<>();
            map.put("fruitsname",fruits_name[i]);
            map.put("fruitsimage",list_fruit_image[i]);
            list.add(map);

        }
         String [] from={"fruitsname","fruitsimage"};
        int [] to = {R.id.textView2,R.id.imageView};
        SimpleAdapter simpleAdapter=new
SimpleAdapter(getApplicationContext(),list,R.layout.friuts_list,from,to);
        listView.setAdapter(simpleAdapter);
     }


}
```