**Q.1) Android programming using graphics and animations.**

**Dice Roller:**

**MainActivity.java:**

package com.example.diceroller;

import android.os.Bundle;

import android.view.View;

import android.view.animation.Animation;

import android.view.animation.AnimationUtils;

import android.widget.ImageView;

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.Random;

public class MainActivity extends AppCompatActivity {

Random rand = new Random();

ImageView diceImage;

@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;

});

diceImage = findViewById(R.id.dice);

diceImage.setOnClickListener(new View.OnClickListener() {

@Override

public void onClick(View view) {

roll();

}

});

}

private void roll() {

int i = rand.nextInt(5) + 1;

Animation anim = AnimationUtils.loadAnimation(this, R.anim.roll);

diceImage.startAnimation(anim);

switch(i) {

case 1:

diceImage.setImageResource(R.drawable.dice1);

break;

case 2:

diceImage.setImageResource(R.drawable.dice2);

break;

case 3:

diceImage.setImageResource(R.drawable.dice3);

break;

case 4:

diceImage.setImageResource(R.drawable.dice4);

break;

case 5:

diceImage.setImageResource(R.drawable.dice5);

break;

case 6:

diceImage.setImageResource(R.drawable.dice6);

break;

}

}

}

**activity\_main.xml:**

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

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

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:tools="http://schemas.android.com/tools"

android:id="@+id/main"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:gravity="center"

android:background="@color/black"

tools:context=".MainActivity">

<ImageView

android:id="@+id/dice"

android:layout\_width="300dp"

android:layout\_height="300dp"

android:src="@drawable/dice1"

/>

</LinearLayout>

**Roll.xml**

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

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

<rotate

android:fromDegrees="0"

android:toDegrees="720"

android:pivotX="50%"

android:pivotY="50%"

android:duration="500"

/>

</set>

**Output:**

**A screen shot of a phone

Description automatically generated A white dice on a black background

Description automatically generated**

**Lil Graphics:**

**MainActivity.java:**

package com.example.lilgraphics;

import android.os.Bundle;

import android.app.Activity;

import android.view.Menu;

import android.content.Context;

import android.graphics.Canvas;

import android.graphics.Color;

import android.graphics.Paint;

import android.view.View;

public class MainActivity extends Activity {

DemoView demoview;

/\*\* Called when the activity is first created. \*/

@Override

public void onCreate(Bundle savedInstanceState) {

super.onCreate(savedInstanceState);

demoview = new DemoView(this);

setContentView(demoview);

}

private class DemoView extends View{

public DemoView(Context context){

super(context);

}

@Override protected void onDraw(Canvas canvas) {

super.onDraw(canvas);

// custom drawing code here

Paint paint = new Paint();

paint.setStyle(Paint.Style.FILL);

// make the entire canvas white

paint.setColor(Color.WHITE);

canvas.drawPaint(paint);

// draw blue circle with anti aliasing turned off

paint.setAntiAlias(false);

paint.setColor(Color.BLUE);

canvas.drawCircle(200, 400, 150, paint);

// draw green circle with anti aliasing turned on

paint.setAntiAlias(true);

paint.setColor(Color.GREEN);

canvas.drawCircle(200, 200, 150, paint);

// draw red rectangle with anti aliasing turned off

paint.setAntiAlias(false);

paint.setColor(Color.RED);

canvas.drawRect(200, 400, 500, 30, paint);

// draw the rotated text

canvas.save(); // Save the current state before rotating

canvas.rotate(-45);

paint.setTextSize(40);

paint.setStyle(Paint.Style.FILL);

canvas.drawText("Graphics Rotation", 200, 600, paint);

//undo the rotate

canvas.restore();

}

}

}

**activity\_main.xml:**

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

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

xmlns:app="http://schemas.android.com/apk/res-auto"

xmlns:tools="http://schemas.android.com/tools"

android:id="@+id/main"

android:layout\_width="match\_parent"

android:layout\_height="match\_parent"

android:orientation="vertical"

android:padding="20dp"

tools:context=".MainActivity"

android:gravity="center">

<TextView

android:layout\_width="match\_parent"

android:layout\_height="wrap\_content"

android:text="Heyyy"

/>

</LinearLayout>

**Output:**

**A cell phone with a blue circle

Description automatically generated**