Name:Krishant Chauhan
Course:-BCA 5A
Roll No:-29
Uni Roll No:-1921085

Problem:-Create a simple application to implement simple calculator in android.

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:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <EditText
        android:id="@+id/result"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:ems="10"
        android:focusable="false"
        android:focusableInTouchMode="true"
        android:inputType="numberSigned|numberDecimal"
        android:textAlignment="center"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

    <Button
        android:id="@+id/button0"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:minWidth="48dp"
        android:text="0"
        app:layout_constraintStart_toStartOf="@+id/button10"
        app:layout_constraintTop_toBottomOf="@+id/button10" />

    <Button
        android:id="@+id/button10"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:minWidth="48dp"
        android:text="1"
        app:layout_constraintStart_toStartOf="@+id/button4"
        app:layout_constraintTop_toBottomOf="@+id/button4" />

    <Button
        android:id="@+id/button2"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
```

```xml
        android:text="2"
        app:layout_constraintBaseline_toBaselineOf="@+id/button10"
        app:layout_constraintStart_toEndOf="@+id/button10" />

    <Button
        android:id="@+id/button3"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="3"
        app:layout_constraintBaseline_toBaselineOf="@+id/button2"
        app:layout_constraintStart_toEndOf="@+id/button2" />

    <Button
        android:id="@+id/button4"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="8dp"
        android:minWidth="48dp"
        android:text="4"
        app:layout_constraintStart_toStartOf="@+id/button7"
        app:layout_constraintTop_toBottomOf="@+id/button7" />

    <Button
        android:id="@+id/button5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="5"
        app:layout_constraintBaseline_toBaselineOf="@+id/button4"
        app:layout_constraintStart_toEndOf="@+id/button4" />

    <Button
        android:id="@+id/button6"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="6"
        app:layout_constraintBaseline_toBaselineOf="@+id/button5"
        app:layout_constraintStart_toEndOf="@+id/button5" />

    <Button
        android:id="@+id/button7"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="96dp"
        android:layout_marginTop="36dp"
        android:minWidth="48dp"
        android:text="7"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/newNumber" />

    <Button
        android:id="@+id/button8"
        android:layout_width="wrap_content"
```

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```xml
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="8"
        app:layout_constraintBaseline_toBaselineOf="@+id/button7"
        app:layout_constraintStart_toEndOf="@+id/button7" />

    <Button
        android:id="@+id/button9"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:text="9"
        app:layout_constraintBaseline_toBaselineOf="@+id/button8"
        app:layout_constraintStart_toEndOf="@+id/button8"
        android:minWidth="48dp" />

    <Button
        android:id="@+id/buttonDivide"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="/"
        app:layout_constraintBaseline_toBaselineOf="@+id/button9"
        app:layout_constraintStart_toEndOf="@+id/button9" />

    <Button
        android:id="@+id/buttonMultiply"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="*"
        app:layout_constraintBaseline_toBaselineOf="@+id/button6"
        app:layout_constraintStart_toEndOf="@+id/button6" />

    <Button
        android:id="@+id/buttonMinus"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="-"
        app:layout_constraintBaseline_toBaselineOf="@+id/button3"
        app:layout_constraintStart_toEndOf="@+id/button3" />

    <Button
        android:id="@+id/buttondot"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="8dp"
        android:minWidth="48dp"
        android:text="."
        app:layout_constraintBaseline_toBaselineOf="@+id/button0"
        app:layout_constraintStart_toEndOf="@+id/button0" />

    <Button
```

```xml
            android:id="@+id/buttonEquals"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="8dp"
            android:minWidth="48dp"
            android:text="="
            app:layout_constraintBaseline_toBaselineOf="@+id/buttondot"
            app:layout_constraintStart_toEndOf="@+id/buttondot" />

    <Button
            android:id="@+id/buttonPlus"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="8dp"
            android:minWidth="48dp"
            android:text="+"
            app:layout_constraintBaseline_toBaselineOf="@+id/buttonEquals"
            app:layout_constraintStart_toEndOf="@+id/buttonEquals" />

    <TextView
            android:id="@+id/operation"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="8dp"
            android:layout_marginTop="8dp"
            android:layout_marginEnd="8dp"
            android:textSize="18sp"
            android:textStyle="bold"
            app:layout_constraintEnd_toStartOf="@+id/newNumber"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toTopOf="@+id/newNumber" />

    <EditText
            android:id="@+id/newNumber"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="8dp"
            android:layout_marginTop="24dp"
            android:layout_marginEnd="8dp"
            android:ems="10"
            android:inputType="numberSigned|numberDecimal"
            app:layout_constraintEnd_toEndOf="parent"
            app:layout_constraintStart_toStartOf="parent"
            app:layout_constraintTop_toBottomOf="@+id/result" />

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

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Java Code:-

```java
package com.example.calculator;

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 {
    private EditText result;
    private EditText newNumber;
    private TextView displayOperation;

    private Double operand1 = null;
    private String pendingOperation = "=";

    private static final String STATE_PENDING_OPERATION =
"PendingOperation";
    private static final String STATE_OPERAND1 = "Operand1";

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

        result = (EditText) findViewById(R.id.result);
        newNumber = (EditText) findViewById(R.id.newNumber);
        displayOperation = (TextView) findViewById(R.id.operation);

        Button button0 = (Button) findViewById(R.id.button0);
        Button button1 = (Button) findViewById(R.id.button10);
        Button button2 = (Button) findViewById(R.id.button2);
        Button button3 = (Button) findViewById(R.id.button3);
        Button button4 = (Button) findViewById(R.id.button4);
        Button button5 = (Button) findViewById(R.id.button5);
        Button button6 = (Button) findViewById(R.id.button6);
        Button button7 = (Button) findViewById(R.id.button7);
        Button button8 = (Button) findViewById(R.id.button8);
        Button button9 = (Button) findViewById(R.id.button9);
        Button buttonDot = (Button) findViewById(R.id.buttondot);
```

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```java
        Button buttonEquals = (Button) findViewById(R.id.buttonEquals);
        Button buttonDivide = (Button) findViewById(R.id.buttonDivide);
        Button buttonMultiply = (Button) findViewById(R.id.buttonMultiply);
        Button buttonMinus = (Button) findViewById(R.id.buttonMinus);
        Button buttonPlus = (Button) findViewById(R.id.buttonPlus);
        View.OnClickListener listener = new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Button b = (Button) view;
                newNumber.append(b.getText().toString());
            }
        };
        button0.setOnClickListener(listener);
        button1.setOnClickListener(listener);
        button2.setOnClickListener(listener);
        button3.setOnClickListener(listener);
        button4.setOnClickListener(listener);
        button5.setOnClickListener(listener);
        button6.setOnClickListener(listener);
        button7.setOnClickListener(listener);
        button8.setOnClickListener(listener);
        button9.setOnClickListener(listener);
        buttonDot.setOnClickListener(listener);

        View.OnClickListener opListener = new View.OnClickListener() {
            @Override
            public void onClick(View view) {
                Button b = (Button) view;
                String op = b.getText().toString();
                String value = newNumber.getText().toString();
                try {
                    Double doubleValue = Double.valueOf(value);
                    performOperation(doubleValue, op);
                } catch (NumberFormatException e) {
                    newNumber.setText("");
                }
                pendingOperation = op;
                displayOperation.setText(pendingOperation);
            }
        };

        buttonEquals.setOnClickListener(opListener);
        buttonDivide.setOnClickListener(opListener);
        buttonMultiply.setOnClickListener(opListener);
        buttonMinus.setOnClickListener(opListener);
        buttonPlus.setOnClickListener(opListener);

    }

    @Override
    protected void onSaveInstanceState(Bundle outState) {
        outState.putString(STATE_PENDING_OPERATION, pendingOperation);
        if (operand1 != null) {
            outState.putDouble(STATE_OPERAND1, operand1);
        }
        super.onSaveInstanceState(outState);
    }
```

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```java
    @Override
    protected void onRestoreInstanceState(Bundle savedInstanceState) {
        super.onRestoreInstanceState(savedInstanceState);
        pendingOperation =
savedInstanceState.getString(STATE_PENDING_OPERATION);
        operand1 = savedInstanceState.getDouble(STATE_OPERAND1);
        displayOperation.setText(pendingOperation);
    }

    private void performOperation(Double value, String operation) {
        if (null == operand1) {
            operand1 = value;
        } else {
            if (pendingOperation.equals("=")) {
                pendingOperation = operation;
            }
            switch (pendingOperation) {
                case "=":
                    operand1 = value;
                    break;
                case "/":
                    if (value == 0) {
                        operand1 = 0.0;
                    } else {
                        operand1 /= value;
                    }
                    break;
                case "*":
                    operand1 *= value;
                    break;
                case "-":
                    operand1 -= value;
                    break;
                case "+":
                    operand1 += value;
                    break;
            }
        }

        result.setText(operand1.toString());
        newNumber.setText("");
    }

}
```
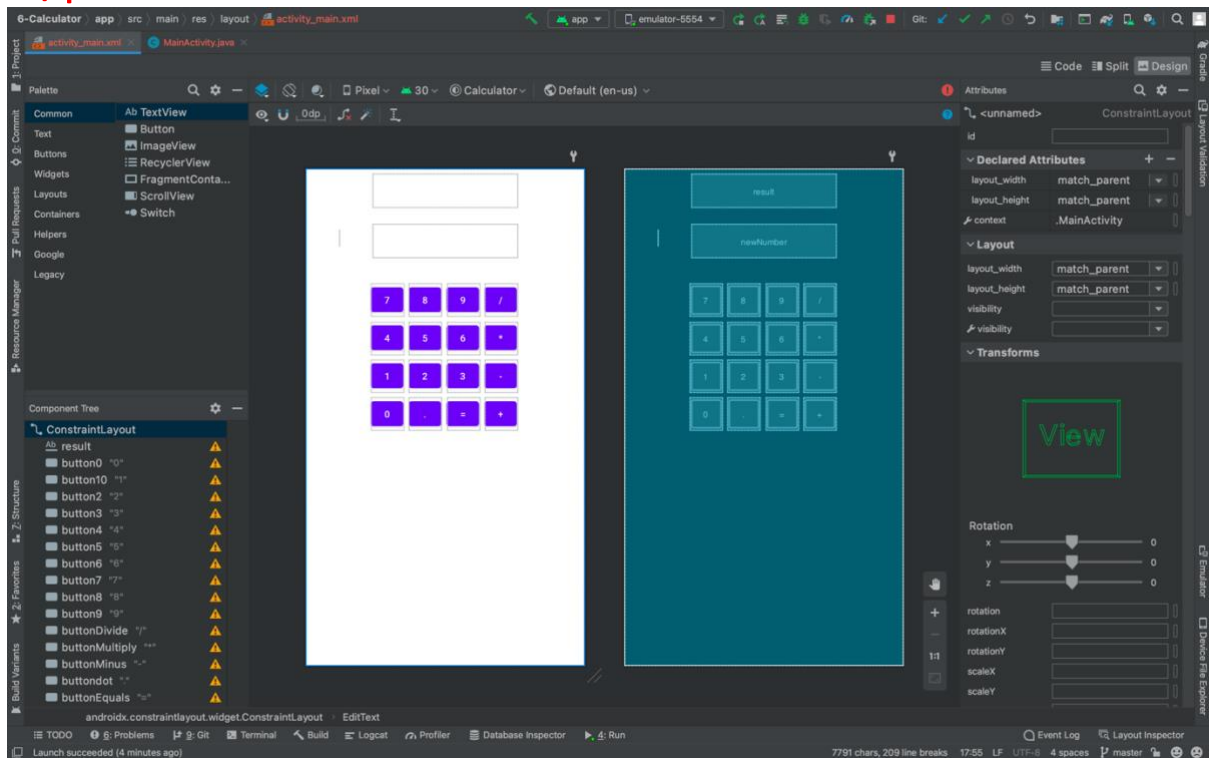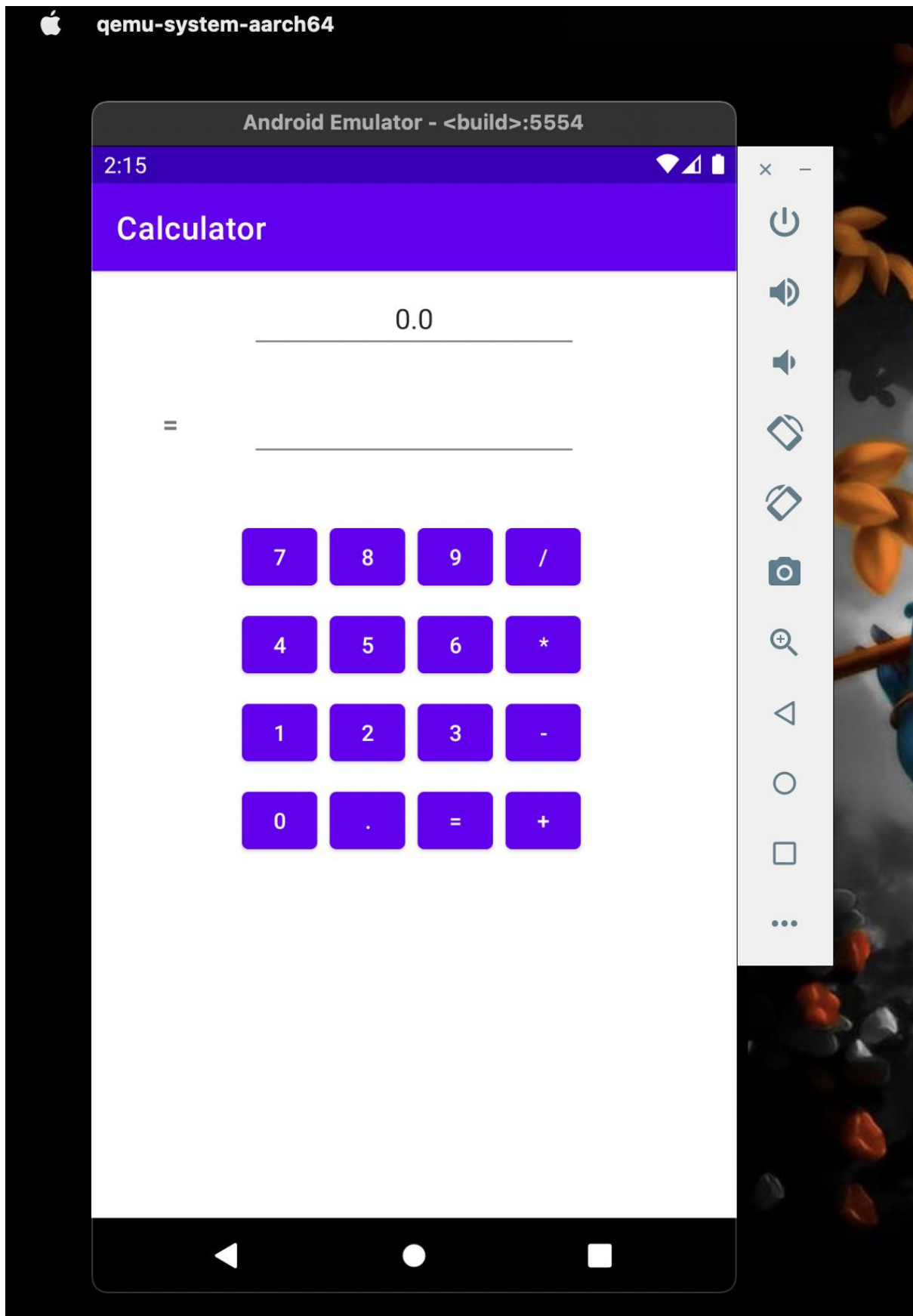
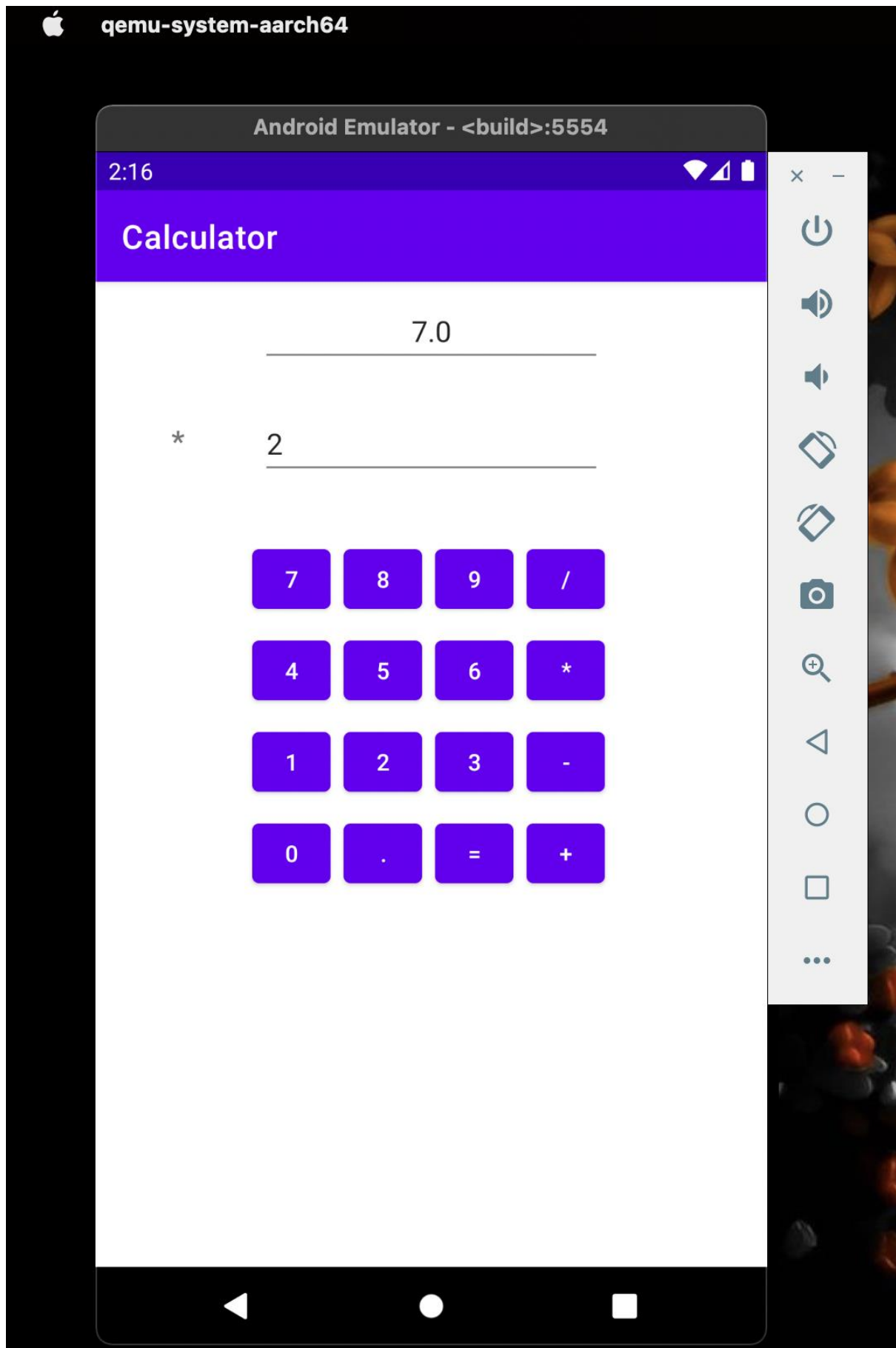Name:Krishant Chauhan
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O/p:-

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qemu-system-aarch64

Android Emulator - <build>:5554

2:16

Calculator

7.0

*   2

7	8	9	/
4	5	6	*
1	2	3	-
0	.	=	+

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