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Experiment No: 5

Aim: WAA to develop an EMI calculator application.

Theory:

- Developing an EMI (Equated Monthly Installment) Calculator application involves creating a user interface to take input values such as principal amount, interest rate, and tenure and then calculating the EMI based on these inputs.
- Below is the a step-by-step guide on how to develop an EMI Calculator application using Android and Java:

Step 1: Setup the Android Project

=> 1) Open Android studio and create a new project.

2) Choose an appropriate template (For e.g., Empty Activity)

3) Setup the project with a sutaible package name and save location.

Step 2: Design the UI

→ To develop EMI calculator, we need to create a UI for input and output, handle user input, perform calculations and display the result.

1) Create the layout

⇒ Design the layout using XML in the 'res/layout' directory. This layout should include input fields for principal amount, interest rate, loan tenure and a button to calculate EMI.

- You can use 'EditText' for input fields and a 'Button' for the calculation trigger.

2) Create MainActivity

⇒ In 'MainActivity.java' file reference the UI components and setup click listener for the calculation button.

- When the button is clicked, retreive input values, perform the EMI calculation and display the result.

3) Implement EMI calculation

⇒ In the 'calculateEMI' method, use the appropriate formula to calculate the EMI based on the principal amount, interest rate and loan tenure

- The monthly Interest can be calculated as -

$$\text{Monthly Interest} = \frac{\text{interest}}{(12 \times 100)}$$

- The emi can be calculated as

$$\text{emi} = \frac{\text{Principal} \times \text{rate} \times \text{divident}}{(\text{divident} - 1)}$$

Conclusion:

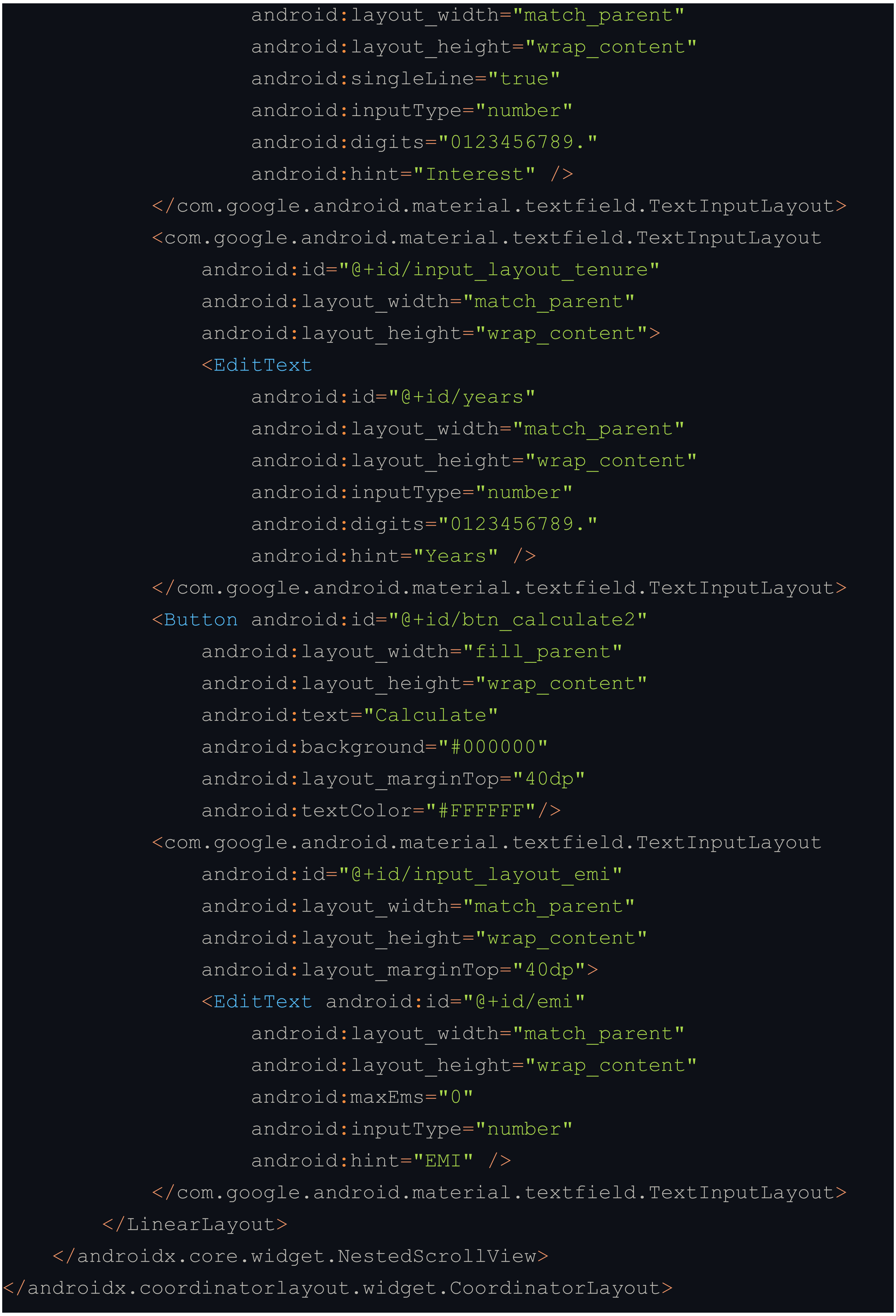
The program to create an android-based EMI calculator was implemented successfully.

A+

Code:

(activity_main.xml)

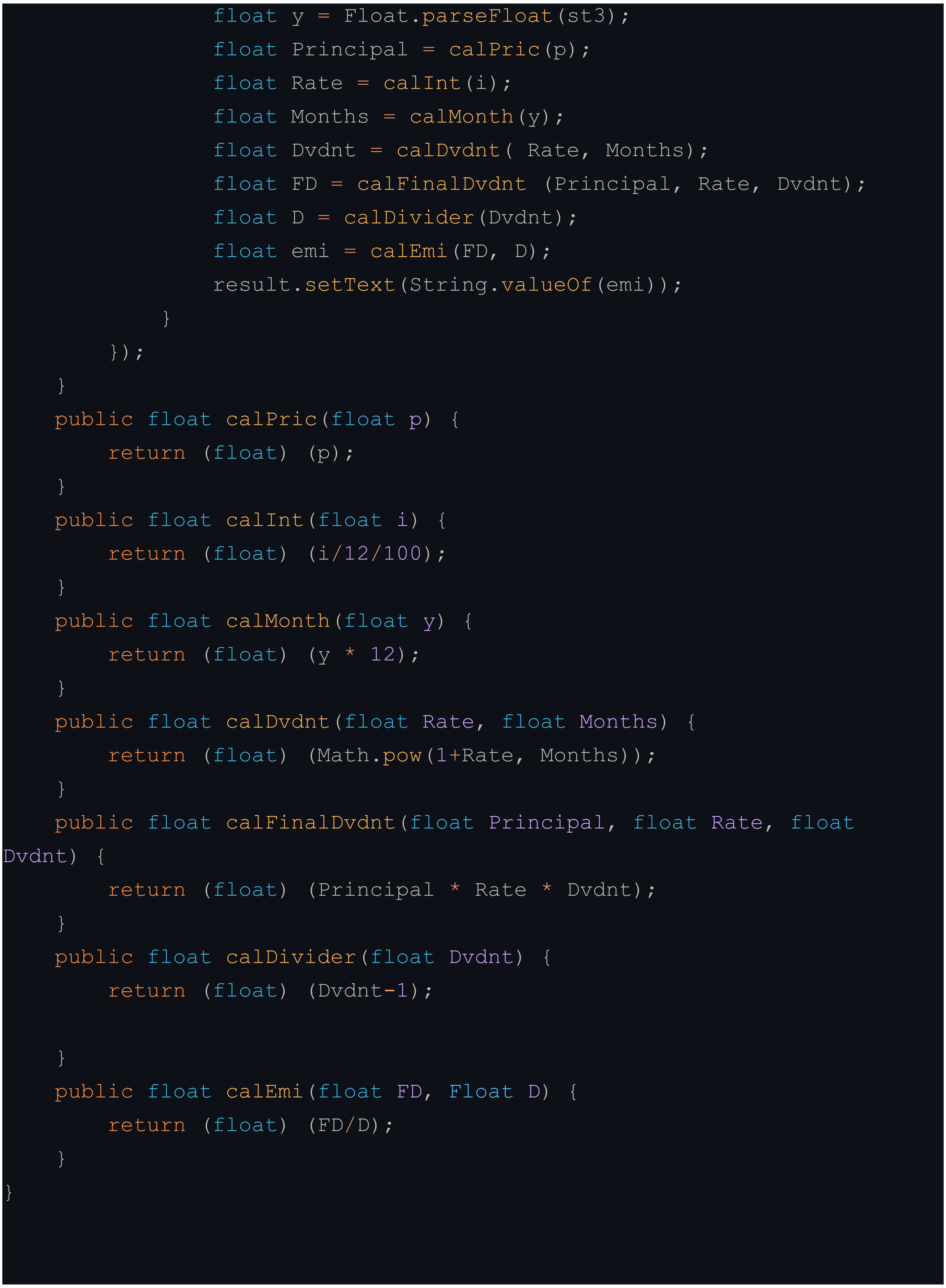
```
<androidx.coordinatorlayout.widget.CoordinatorLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    xmlns:tools="http://schemas.android.com/tools"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    tools:context="com.example.mcc_exp5.MainActivity"
    android:layout_height="match_parent"
    android:background="@color/black"
    android:backgroundTint="@color/black">
    <androidx.core.widget.NestedScrollView
        android:layout_width="match_parent"
        android:layout_height="match_parent"
        app:layout_behavior="@string/appbar_scrolling_view_behavior">
        <LinearLayout
            android:layout_width="fill_parent"
            android:layout_height="match_parent"
            android:layout_marginTop="?attr/actionBarSize"
            android:orientation="vertical"
            android:paddingLeft="20dp"
            android:paddingRight="20dp"
            android:paddingTop="10dp">
            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_layout_principal"
                android:layout_width="match_parent"
                android:layout_height="wrap_content">
                <EditText
                    android:id="@+id/principal"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:singleLine="true"
                    android:inputType="number"
                    android:digits="0123456789."
                    android:hint="Principal" />
            </com.google.android.material.textfield.TextInputLayout>
            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_layout_interest"
                android:layout_width="match_parent"
                android:layout_height="wrap_content">
                <EditText android:id="@+id/interest"
```



```
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:singleLine="true"
                    android:inputType="number"
                    android:digits="0123456789."
                    android:hint="Interest" />
            </com.google.android.material.textfield.TextInputLayout>
            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_layout_tenure"
                android:layout_width="match_parent"
                android:layout_height="wrap_content">
                <EditText
                    android:id="@+id/years"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:inputType="number"
                    android:digits="0123456789."
                    android:hint="Years" />
            </com.google.android.material.textfield.TextInputLayout>
            <Button android:id="@+id/btn_calculate2"
                android:layout_width="fill_parent"
                android:layout_height="wrap_content"
                android:text="Calculate"
                android:background="#000000"
                android:layout_marginTop="40dp"
                android:textColor="#FFFFFF"/>
            <com.google.android.material.textfield.TextInputLayout
                android:id="@+id/input_layout_emi"
                android:layout_width="match_parent"
                android:layout_height="wrap_content"
                android:layout_marginTop="40dp">
                <EditText android:id="@+id/emi"
                    android:layout_width="match_parent"
                    android:layout_height="wrap_content"
                    android:maxEms="0"
                    android:inputType="number"
                    android:hint="EMI" />
            </com.google.android.material.textfield.TextInputLayout>
        </LinearLayout>
    </androidx.core.widget.NestedScrollView>
</androidx.coordinatorlayout.widget.CoordinatorLayout>
```

(MainActivity.java)

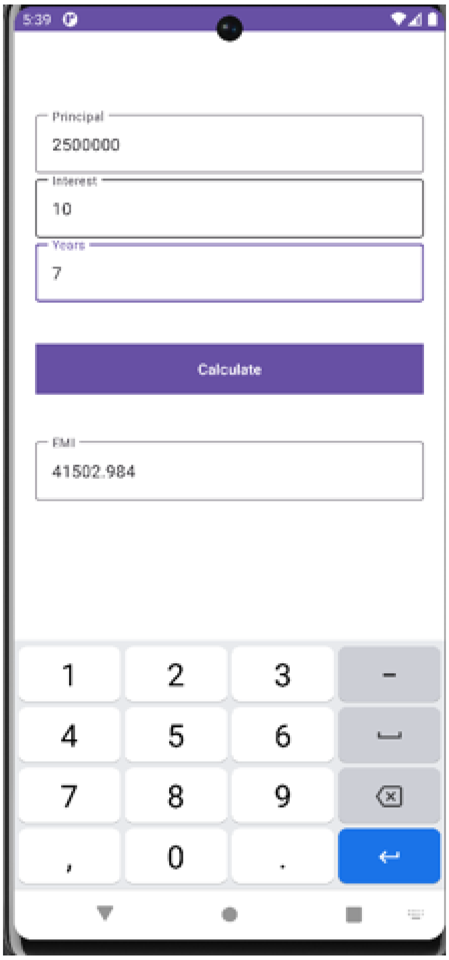
```
package com.example.mcc_exp5;
import android.os.Bundle;
import androidx.appcompat.app.AppCompatActivity;
import android.text.TextUtils;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
public class MainActivity extends AppCompatActivity {
    Button emiCalcBtn;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        final EditText P = (EditText)findViewById(R.id.principal);
        final EditText I = (EditText)findViewById(R.id.interest);
        final EditText Y = (EditText)findViewById(R.id.years);
        final EditText result = (EditText)findViewById(R.id.emi);
        emiCalcBtn = (Button) findViewById(R.id.btn_calculate2);
        emiCalcBtn.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String st1 = P.getText().toString();
                String st2 = I.getText().toString();
                String st3 = Y.getText().toString();
                if (TextUtils.isEmpty(st1)) {
                    P.setError("Enter Prncipal Amount");
                    P.requestFocus();
                    return;
                }
                if (TextUtils.isEmpty(st2)) {
                    I.setError("Enter Interest Rate");
                    I.requestFocus();
                    return;
                }
                if (TextUtils.isEmpty(st3)) {
                    Y.setError("Enter Years");
                    Y.requestFocus();
                    return;
                }
                float p = Float.parseFloat(st1);
                float i = Float.parseFloat(st2);
```



```
                float y = Float.parseFloat(st3);
                float Principal = calPric(p);
                float Rate = calInt(i);
                float Months = calMonth(y);
                float Dvdnt = calDvdnt( Rate, Months);
                float FD = calFinalDvdnt (Principal, Rate, Dvdnt);
                float D = calDivider(Dvdnt);
                float emi = calEmi(FD, D);
                result.setText(String.valueOf(emi));
            }
        });
    }
    public float calPric(float p) {
        return (float) (p);
    }
    public float calInt(float i) {
        return (float) (i/12/100);
    }
    public float calMonth(float y) {
        return (float) (y * 12);
    }
    public float calDvdnt(float Rate, float Months) {
        return (float) (Math.pow(1+Rate, Months));
    }
    public float calFinalDvdnt(float Principal, float Rate, float
Dvdnt) {
        return (float) (Principal * Rate * Dvdnt);
    }
    public float calDivider(float Dvdnt) {
        return (float) (Dvdnt-1);

    }
    public float calEmi(float FD, Float D) {
        return (float) (FD/D);
    }
}
```

Output:



Principal

2500000

Interest

10

Years

7

EMI

41502.984