Instituto Politécnico Nacional

Escuela Superior De Computo

Desarrollo De Aplicaciones Móviles Nativas

Tarea 2

Transiciones entre Activities

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Fecha De Entrega: 22/02/2025

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Ejercicio 1: Calculadora Funcional

Descripción de la implementación

```java
package com.example.myxapplication;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.EditText;
import android.widget.ImageButton;

public class CalculatorActivity extends AppCompatActivity {

    EditText display;
    Button button0, button1, button2, button3, button4, button5, button6, button7, button8, button9;
    Button buttonAdd, buttonSubtract, buttonMultiply, buttonDivide, buttonEquals, buttonClear, buttonDelete, buttonDot;

    double operand1 = 0;
    String operator = "";

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

        ImageButton btnBack = findViewById(R.id.btnBack);
        btnBack.setOnClickListener(v -> finish());
```

```java
public class CalculatorActivity extends AppCompatActivity {
    protected void onCreate(Bundle savedInstanceState) {

        // Initialize UI elements
        display = findViewById(R.id.display);
        button0 = findViewById(R.id.button0);
        button1 = findViewById(R.id.button1);
        button2 = findViewById(R.id.button2);
        button3 = findViewById(R.id.button3);
        button4 = findViewById(R.id.button4);
        button5 = findViewById(R.id.button5);
        button6 = findViewById(R.id.button6);
        button7 = findViewById(R.id.button7);
        button8 = findViewById(R.id.button8);
        button9 = findViewById(R.id.button9);
        buttonAdd = findViewById(R.id.buttonAdd);
        buttonSubtract = findViewById(R.id.buttonSubtract);
        buttonMultiply = findViewById(R.id.buttonMultiply);
        buttonDivide = findViewById(R.id.buttonDivide);
        buttonEquals = findViewById(R.id.buttonEquals);
        buttonClear = findViewById(R.id.buttonClear);
        buttonDelete = findViewById(R.id.buttonDelete);
        buttonDot = findViewById(R.id.buttonDot);

        // Set click listeners for number buttons
        View.OnClickListener numberClickListener = new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                Button button = (Button) v;
                String currentText = display.getText().toString();
                if (currentText.equals("0")) {
                    display.setText(button.getText().toString());
                } else {
                    display.setText(currentText + button.getText().toString());
                }
            }
        };
```

```java
button0.setOnClickListener(numberClickListener);
button1.setOnClickListener(numberClickListener);
button2.setOnClickListener(numberClickListener);
button3.setOnClickListener(numberClickListener);
button4.setOnClickListener(numberClickListener);
button5.setOnClickListener(numberClickListener);
button6.setOnClickListener(numberClickListener);
button7.setOnClickListener(numberClickListener);
button8.setOnClickListener(numberClickListener);
button9.setOnClickListener(numberClickListener);

// Set click listeners for operator buttons
View.OnClickListener operatorClickListener = new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        Button button = (Button) v;
        operand1 = Double.parseDouble(display.getText().toString());
        operator = button.getText().toString();
        display.setText("0");
    }
};

buttonAdd.setOnClickListener(operatorClickListener);
buttonSubtract.setOnClickListener(operatorClickListener);
buttonMultiply.setOnClickListener(operatorClickListener);
buttonDivide.setOnClickListener(operatorClickListener);

// Set click listener for equals button
buttonEquals.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {
        double operand2 = Double.parseDouble(display.getText().toString());
        double result = 0;
```

```java
        switch (operator) {
            case "+":
                result = operand1 + operand2;
                break;
            case "-":
                result = operand1 - operand2;
                break;
            case "*":
                result = operand1 * operand2;
                break;
            case "/":
                if (operand2 != 0) {
                    result = operand1 / operand2;
                } else {
                    display.setText("Error");
                    return;
                }
                break;
        }

        display.setText(String.valueOf(result));
        operand1 = result;
        operator = "";
    }
});
```

```java
        // Set click listener for clear button
        buttonClear.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                display.setText("0");
                operand1 = 0;
                operator = "";
            }
        });

        // Set click listener for delete button
        buttonDelete.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String currentText = display.getText().toString();
                if (currentText.length() > 0) {
                    display.setText(currentText.substring(beginIndex:0, currentText.length() - 1));
                }
            }
        });

        // Set click listener for dot button
        buttonDot.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                String currentText = display.getText().toString();
                if (!currentText.contains(s:".")) {
                    display.setText(currentText + ".");
                }
            }
        });
    }
}
```

Diseño del layout

```xml
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:orientation="vertical"
    android:padding="16dp"
    tools:context=".MainActivity"
    android:label="@string/calculator">

    <!-- Back Button -->
    <ImageButton
        android:id="@+id/btnBack"
        android:layout_width="48dp"
        android:layout_height="48dp"
        android:src="@drawable/ic_arrow_back"
        android:background="?attr/selectableItemBackgroundBorderless"
        android:contentDescription="Back"
        android:layout_marginBottom="16dp"/>
```

```xml
    <!-- Display Area -->
    <EditText
        android:id="@+id/display"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginBottom="16dp"
        android:background="@android:color/darker_gray"
        android:gravity="end"
        android:hint="0"
        android:importantForAutofill="no"
        android:inputType="none"
        android:padding="8dp"
        android:text="0"
        android:textColor="@android:color/white"
        android:textSize="36sp"
        android:focusable="false"
        android:focusableInTouchMode="false"/>

    <!-- Button Panel -->
    <GridLayout
        android:id="@+id/buttonPanel"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:columnCount="4"
        android:rowCount="5">
```

```xml
<!-- Row 1 -->
<Button
    android:id="@+id/buttonClear"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_row="0"
    android:layout_column="0"
    android:layout_columnWeight="1"
    android:layout_gravity="fill"
    android:text="C"
    android:textSize="24sp" />

<Button
    android:id="@+id/buttonDivide"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_row="0"
    android:layout_column="1"
    android:layout_columnWeight="1"
    android:layout_gravity="fill"
    android:text="/"
    android:textSize="24sp" />

<Button
    android:id="@+id/buttonMultiply"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_row="0"
    android:layout_column="2"
    android:layout_columnWeight="1"
    android:layout_gravity="fill"
    android:text="*"
    android:textSize="24sp" />
```

```xml
    android:textSize="24sp" />

<Button
    android:id="@+id/buttonDelete"
    android:layout_width="0dp"
    android:layout_height="wrap_content"
    android:layout_row="0"
    android:layout_column="3"
    android:layout_columnWeight="1"
    android:layout_gravity="fill"
    android:text="DEL"
    android:textSize="24sp" />
```

Ejercicio 2: Menú Principal y cronómetro

Implementación del cronómetro

```java
package com.example.myxapplication;

import android.os.Bundle;
import android.os.Handler;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.Chronometer;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
import android.widget.ImageButton;

public class ChronometerActivity extends AppCompatActivity {
    private Chronometer chronometer;
    private TextView tvMillis;
    private boolean running;
    private long pauseOffset;
    private Handler handler;
    private Runnable updateMillis;

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

        ImageButton btnBack = findViewById(R.id.btnBack);
        btnBack.setOnClickListener(v -> finish());

        chronometer = findViewById(R.id.chronometer);
        tvMillis = findViewById(R.id.tvMillis);
        Button btnStart = findViewById(R.id.btnStart);
        Button btnPause = findViewById(R.id.btnPause);
        Button btnReset = findViewById(R.id.btnReset);
```

```java
package com.example.myxapplication;

import android.os.Bundle;
import android.os.Handler;
import android.os.SystemClock;
import android.view.View;
import android.widget.Button;
import android.widget.Chronometer;
import android.widget.TextView;
import androidx.appcompat.app.AppCompatActivity;
import android.widget.ImageButton;

public class ChronometerActivity extends AppCompatActivity {
    private Chronometer chronometer;
    private TextView tvMillis;
    private boolean running;
    private long pauseOffset;
    private Handler handler;
    private Runnable updateMillis;

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

        ImageButton btnBack = findViewById(R.id.btnBack);
        btnBack.setOnClickListener(v -> finish());

        chronometer = findViewById(R.id.chronometer);
        tvMillis = findViewById(R.id.tvMillis);
        Button btnStart = findViewById(R.id.btnStart);
        Button btnPause = findViewById(R.id.btnPause);
        Button btnReset = findViewById(R.id.btnReset);
```

```java
        handler = new Handler();
        updateMillis = new Runnable() {
            @Override
            public void run() {
                if (running) {
                    long time = SystemClock.elapsedRealtime() - chronometer.getBase();
                    int milliseconds = (int) (time % 1000) / 10;
                    tvMillis.setText(String.format(format:".%02d", milliseconds));
                    handler.postDelayed(this, 10);
                }
            }
        };

        chronometer.setOnChronometerTickListener(new Chronometer.OnChronometerTickListener() {
            @Override
            public void onChronometerTick(Chronometer cArg) {
                long time = SystemClock.elapsedRealtime() - cArg.getBase();
                int hours = (int) (time / 3600000);
                int minutes = (int) (time - hours * 3600000) / 60000;
                int seconds = (int) (time - hours * 3600000 - minutes * 60000) / 1000;

                String displayTime;
                if (hours > 0) {
                    displayTime = String.format(format:"%d:%02d:%02d", hours, minutes, seconds);
                } else {
                    displayTime = String.format(format:"%02d:%02d", minutes, seconds);
                }
                cArg.setText(displayTime);
            }
        });

        btnStart.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (!running) {
                    chronometer.setBase(SystemClock.elapsedRealtime() - pauseOffset);
                    chronometer.start();
                    running = true;
                    handler.post(updateMillis);
                }
            }
        });

        btnPause.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                if (running) {
                    chronometer.stop();
                    handler.removeCallbacks(updateMillis);
                    pauseOffset = SystemClock.elapsedRealtime() - chronometer.getBase();
                    running = false;
                }
            }
        });

        btnReset.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                chronometer.setBase(SystemClock.elapsedRealtime());
                chronometer.setText("00:00"); // Reset display to initial state
                tvMillis.setText(".00");
                pauseOffset = 0;
                if (!running) {
                    chronometer.stop();
                    handler.removeCallbacks(updateMillis);
                }
            }
        });
    }

    @Override
    protected void onDestroy() {
        super.onDestroy();
        handler.removeCallbacks(updateMillis);
    }
}
```

Implementación del menú principal

```java
package com.example.myxapplication;

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

public class MainActivity extends AppCompatActivity {
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main_menu);

        Button btnCalculator = findViewById(R.id.btnCalculator);
        Button btnChronometer = findViewById(R.id.btnChronometer);

        btnCalculator.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                startActivity(new Intent(MainActivity.this, CalculatorActivity.class));
            }
        });

        btnChronometer.setOnClickListener(new View.OnClickListener() {
            @Override
            public void onClick(View v) {
                startActivity(new Intent(MainActivity.this, ChronometerActivity.class));
            }
        });
    }
}
```
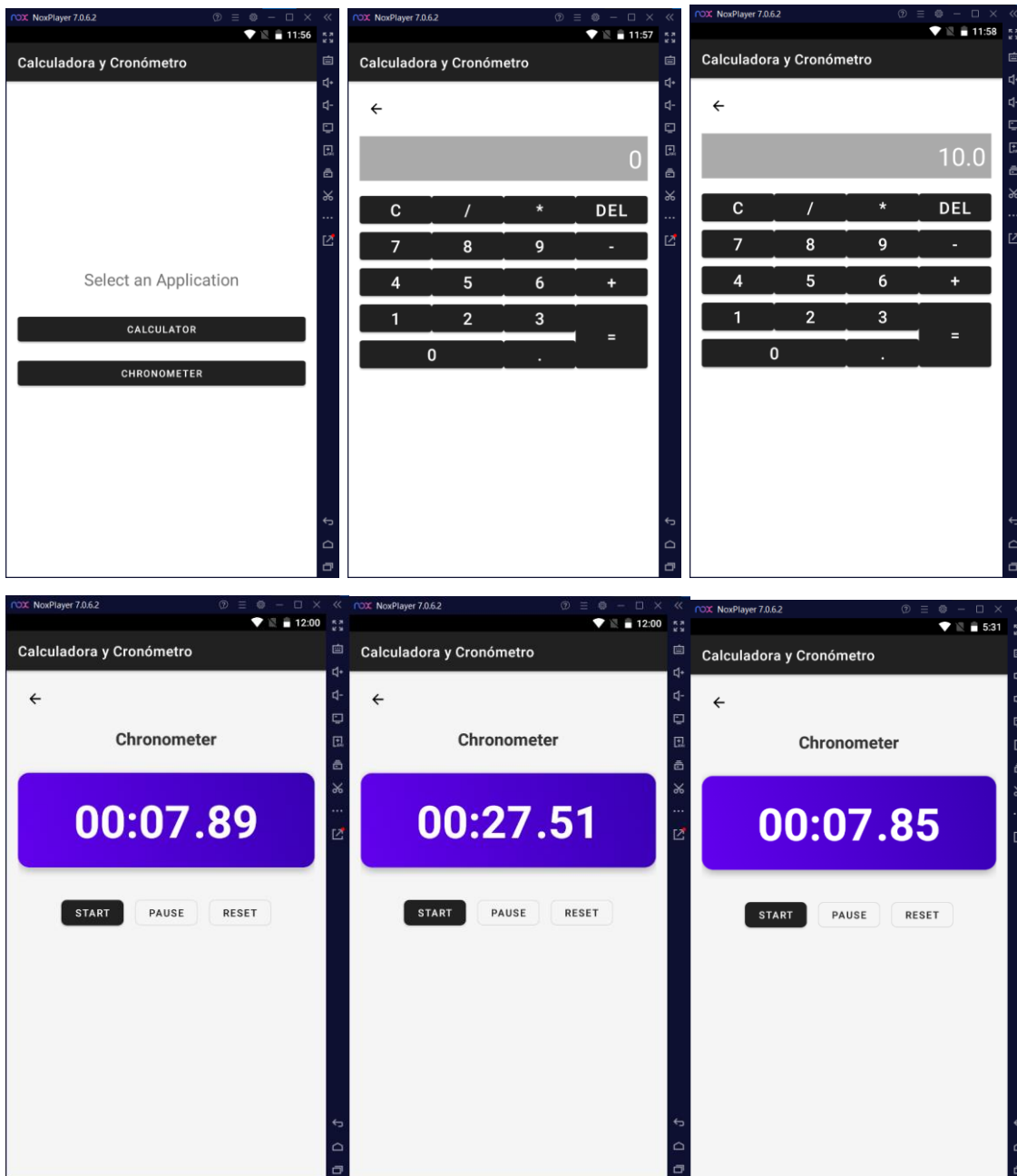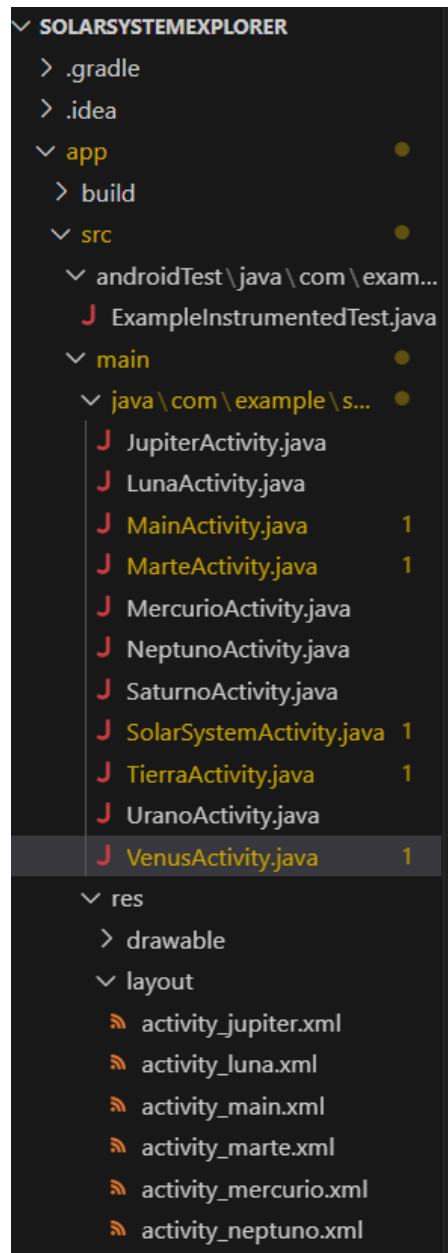
Capturas de pantalla y resultados

Ejercicio 3: Sistema de Navegación Jerárquica

Descripción del sistema implementado

Estructura de navegación

Capturas de pantalla y resultados