Green University of Bangladesh

Department of Computer Science and Engineering (CSE)
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Lab Report 2: Login and Temperature Converter

Course Title: Mobile Application Development Lab
Course Code: CSE-426
Section: 222-D2

Students Details

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Lab Project Status	
Marks:	**Signature:**
Comments:	**Date:**

1 Objective

The objective of this lab was to develop a simple Android application with two activities. The first activity is a login screen that authenticates a user based on a hardcoded email and password. Upon successful login, the user is redirected to a second activity, which is a temperature converter. The temperature converter allows the user to convert a temperature value from Celsius to Fahrenheit and vice-versa.

2 Procedure

The application was developed using Android Studio. The user interface for both activities was designed using XML, and the logic was implemented in Java. The following steps were taken to create the application:

1. A new Android Studio project was created.
2. The layout for the main activity (`activity_main.xml`) was designed with two `EditText` fields for email and password, a `Button` for login, and a `LinearLayout` acting as a reset button.
3. The `MainActivity.java` class was implemented to handle the logic for the login screen. It validates the user's credentials and, upon successful login, starts the `TemperatureActivity`.
4. The layout for the temperature converter activity (`activity_temperature.xml`) was designed with a `TextInputEditText` for entering the temperature in Celsius, two `Buttons` for conversion, a `TextView` to display the result, and a `Button` to go back to the login screen.
5. The `TemperatureActivity.java` class was implemented to handle the temperature conversion logic. It converts Celsius to Fahrenheit and Fahrenheit to Celsius and displays the result.

3 Implementation

3.1 MainActivity.java

This file contains the Java code for the login screen. It handles user input, validates credentials, and navigates to the temperature converter activity upon successful login.

```
package com.example.labreport2;

import static android.widget.Toast.LENGTH_LONG;

import android.content.Intent;
import android.os.Bundle;
```

```
import android.widget.Button;
import android.widget.EditText;
import android.widget.LinearLayout;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {
    EditText etName, etPass, etEmail;
    Button btnOk;
    LinearLayout btnReset;
    String name, pass, email;

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

        etPass = findViewById(R.id.etPass);
        etEmail = findViewById(R.id.etEmail);
        btnOk = findViewById(R.id.btnOk);
        btnReset = findViewById(R.id.btnReset);

        btnOk.setOnClickListener(view -> {

            pass = etPass.getText().toString();
            email = etEmail.getText().toString();

            if (!email.isEmpty() && !pass.isEmpty() && email.equals("romjan@gmail.
                Toast.makeText(this, "Login successful!\n", LENGTH_LONG).show();

                startActivity(new Intent(this, TemperatureActivity.class));


            } else Toast.makeText(this, "Invalid Credentials!", Toast.LENGTH_SHORT

        });

        btnReset.setOnClickListener(view -> {

            pass = etPass.getText().toString();
            email = etEmail.getText().toString();

            if (!name.isEmpty() || !pass.isEmpty() || !email.isEmpty()) {
                etPass.getText().clear();
                etEmail.getText().clear();

                Toast.makeText(this, "Reset Done!", Toast.LENGTH_SHORT).show();
```

```
            }


        });

    }
}
```

3.2 activity$_{m}$*ain.xml*

This XML file defines the layout for the login screen. It includes input fields for email and password, a login button, and a reset button.

```
<?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:layout_width="match_parent"
    android:layout_height="match_parent"
    android:background="@color/white"
    android:orientation="vertical"
    android:padding="20dp"
    tools:context=".MainActivity">

    <TextView
        android:id="@+id/textView3"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:paddingTop="20dp"
        android:paddingBottom="10dp"
        android:text="Log-in Page"
        android:textAlignment="center"
        android:textColor="@color/black"
        android:textSize="40sp" />

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Enter Email" />

    <EditText
        android:id="@+id/etEmail"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Email"
```

```
        android:inputType="textEmailAddress" />

    <TextView
        android:id="@+id/textView5"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Enter Password" />

    <EditText
        android:id="@+id/etPass"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="Password"
        android:inputType="textPassword" />

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

        <LinearLayout
            android:id="@+id/btnReset"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:background="@color/black"
            android:gravity="center"
            android:orientation="horizontal"
            android:paddingStart="10dp"
            android:paddingEnd="10dp">

            <ImageView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:src="@android:drawable/ic_input_delete"
                app:tint="@color/white" />

            <TextView
                android:layout_width="wrap_content"
                android:layout_height="wrap_content"
                android:layout_marginStart="10dp"
                android:text="Reset"
                android:textColor="@color/white" />
        </LinearLayout>

        <Button
```

```
            android:id="@+id/btnOk"
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:layout_marginStart="10dp"
            android:backgroundTint="#2196F3"
            android:text="Login" />

    </LinearLayout>

</LinearLayout>
```

3.3 TemperatureActivity.java

This file contains the Java code for the temperature converter. It handles the conversion from Celsius to Fahrenheit and vice-versa.

```
package com.example.labreport2;

import static android.view.View.VISIBLE;

import android.annotation.SuppressLint;
import android.os.Bundle;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import android.widget.Toast;

import androidx.appcompat.app.AppCompatActivity;

import com.google.android.material.textfield.TextInputEditText;

import java.util.Objects;

public class TemperatureActivity extends AppCompatActivity {

    TextInputEditText tidCelcius;
    Button btnConvert, btnConvertFTOC, btnBack;
    String degree;
    TextView tvResult;
    double resultFahrenheit;

    @SuppressLint("SetTextI18n")
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_temperature);
```

```
        tidCelcius = findViewById(R.id.tidCelcius);
        btnConvert = findViewById(R.id.btnConvert);
        tvResult = findViewById(R.id.tvResult);
        btnBack = findViewById(R.id.btnBack);
        btnConvertFTOC = findViewById(R.id.btnConvertFTOC);

        btnBack.setOnClickListener(view -> finish());

        btnConvert.setOnClickListener(view -> {

            degree = Objects.requireNonNull(tidCelcius.getText()).toString();

            if (!degree.isEmpty()) {
                double temp = Double.parseDouble(degree);
                resultFahrenheit = (temp * 1.8) + 32;

                tvResult.setVisibility(VISIBLE);
                tvResult.setTextColor(getResources().getColor(R.color.black, null)
                tvResult.setText("Result: " + resultFahrenheit + "F");
                Toast.makeText(this, "Convert Successful!", Toast.LENGTH_SHORT).sh
            }


        });

        btnConvertFTOC.setOnClickListener(view -> {

            if (resultFahrenheit > 0) {

                double result = (resultFahrenheit - 32) / 1.8;

                tvResult.setVisibility(View.VISIBLE);
                tvResult.setTextColor(getResources().getColor(R.color.black, null)
                tvResult.setText("Result: " + result + "°C");
                Toast.makeText(this, "Conversion Successful!", Toast.LENGTH_SHORT)

            } else Toast.makeText(this, "Please convert first!", Toast.LENGTH_SHOR

        });


    }
}
```

3.4 activity_temperature.xml

This XML file defines the layout for the temperature converter screen. It includes an input field for the temperature in Celsius, buttons for conversion, a text view to display the result, and a back button.

```
<?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=".TemperatureActivity">

    <TextView
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Temperature Converter"
        android:textSize="25sp"
        android:textStyle="bold"
        android:gravity="center"
        android:padding="20dp"
        />

    <com.google.android.material.textfield.TextInputLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <com.google.android.material.textfield.TextInputEditText
            android:id="@+id/tidCelcius"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:hint="Enter Celcius" />

    </com.google.android.material.textfield.TextInputLayout>

    <Button
        android:id="@+id/btnConvert"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:backgroundTint="@color/black"
        android:layout_marginTop="20dp"
        android:text="Convert Celsius to Fahrenheit" />

    <Button
```

```
        android:id="@+id/btnConvertFTOC"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="20dp"
        android:backgroundTint="@color/black"
        android:text="Convert Fahrenheit to Celsius." />

    <TextView
        android:id="@+id/tvResult"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Result"
        android:textSize="25sp"
        android:textStyle="bold"
        android:gravity="center"
        android:padding="20dp"
        android:visibility="gone"
        />

    <Button
        android:id="@+id/btnBack"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="50dp"
        android:backgroundTint="@color/black"
        android:layout_gravity="center"
        android:text="Go Back" />

</LinearLayout>
```

4 Output

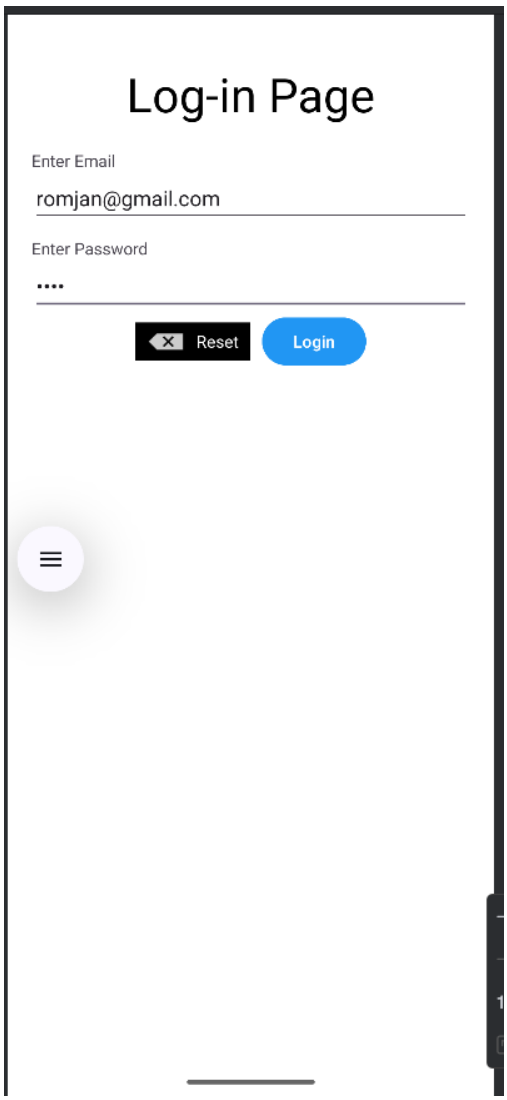

Figure 1: Login Page

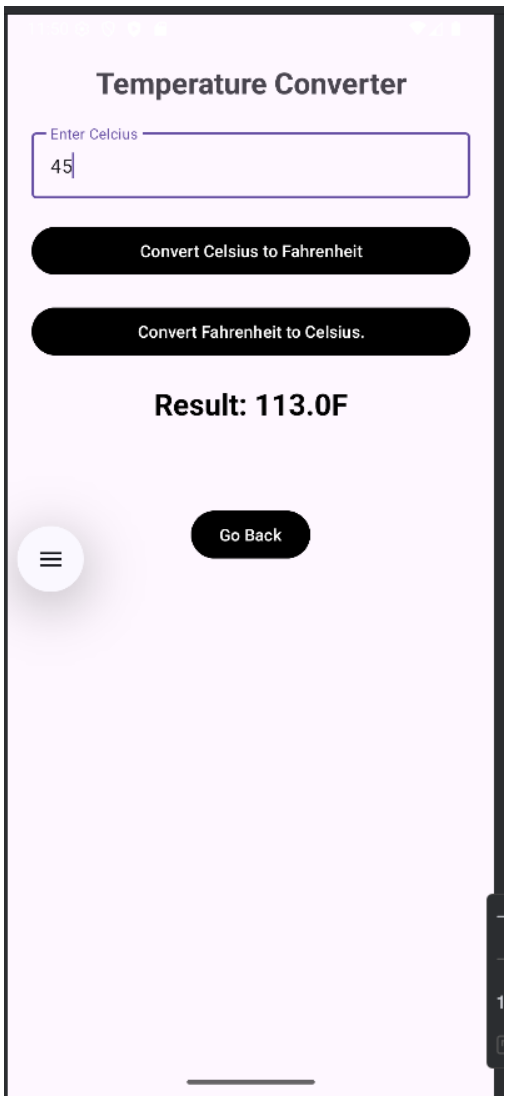

Figure 2: Temperature Conversion

5 Discussion

The application successfully meets the objectives of the lab. The login screen correctly authenticates the user, and the temperature converter performs the conversions as expected. The use of `Intent` to navigate between activities is a fundamental concept in Android development and was implemented correctly.

The code is well-structured and follows standard Android development practices. The use of `findViewById` to get references to the views in the layout is standard practice. The click listeners for the buttons are implemented using lambda expressions, which makes the code more concise.

One area for improvement would be to avoid hardcoding the login credentials. In a real-world application, these would be fetched from a secure server or a local database.

Additionally, the conversion from Fahrenheit back to Celsius depends on the Celsius to Fahrenheit conversion being performed first. This could be improved by allowing the user to input a Fahrenheit value directly.

Overall, this lab was a good exercise in understanding the basics of Android application development, including UI design with XML, activity lifecycle management, and event handling.