임베디드 시스템 실습 lab8

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이번 exercise 는 android studio 를 실재로 사용해보기 위해 간단한 temperature converter 애플리케이션을 구현하는 것입니다.

먼저 strings.xml code 입니다.

activity_main.xml × strings.xml × v24/ic_launcher_foregrou

Edit translations for all locales in the translations editor.

```xml
<resources>
    <string name="app_name">Temperature Converter</string>
    <string name="action_settings">Settings</string>
    <string name="hello_world">Hello world!</string>
    <color name="myColor">#F5F5F5</color>
    <string name="celsius">to Celsius</string>
    <string name="fahrenheit">to Fahrenheit</string>
    <string name="calc">Calculate</string>
</resources>
```

app 의 이름은 Temperature Converter 라 하였고, 사용자에게 보일 text 인 'to Celsius', 'to Fahrenheit'과 버튼 'Calculate'가 입력되어 있습니다.

다음은 layout 의 code 입니다. 우선 Linear layout 과 사용자가 input 할 숫자를 구현했습니다.

activity_main.xml × strings.xml × v24/ic_launcher_foreground.xml ×

```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:background="@color/myColor">


<EditText
    android:id="@+id/inputValue"
    android:layout_width="match_parent"
    android:layout_height="wrap_content"
    android:layout_alignParentRight="true"
    android:layout_below="@+id/textView"
    android:ems="10"
    android:inputType="numberSigned|numberDecimal" />
```

activity_main.xml × strings.xml × v24/ic_launcher_for

```
13      android:layout_height="wrap_content"
14      android:layout_alignParentRight="true"
15      android:layout_below="@+id/textView"
16      android:ems="10"
17      android:inputType="numberSigned|numberDecimal" />
18
19  <RadioGroup
20      android:id="@+id/radioGroup1"
21      android:layout_width="wrap_content"
22      android:layout_height="wrap_content"
23      android:layout_alignLeft="@+id/editText1"
24      android:layout_below="@+id/editText1">
25
26      <RadioButton
27          android:id="@+id/radio0"
28          android:layout_width="wrap_content"
29          android:layout_height="wrap_content"
30          android:checked="true"
31          android:text="@string/celsius" />
32
33      <RadioButton
34          android:id="@+id/radio1"
35          android:layout_width="wrap_content"
36          android:layout_height="wrap_content"
37          android:text="@string/fahrenheit" />
38  </RadioGroup>
39
40  <Button
41      android:id="@+id/button1"
42      android:layout_width="wrap_content"
43      android:layout_height="wrap_content"
44      android:layout_alignLeft="@+id/radioGroup1"
45      android:layout_below="@+id/radioGroup1"
46      android:layout_marginTop="22dp"
47      android:text="@string/calc"
48      android:onClick="onClick"/>
49
50  </LinearLayout>
```

다음으로 RadioGroup 으로 'to Celsius'와 'to Fahrenheit' 을 묶어서 구현하고, 마지막으로 버튼인 'Calculate'를 구현하여 RadioGroup 과 연결해 주었습니다.

다음은 온도를 변환하는 코드입니다. ConverterUtil 이라는 class 를 만들어서 구현했습니다.

activity_main.xml × strings.xml × v24/ic_launcher_foreground.xml × MainActivity.java × ConverterUtil.java ×

```
1   package com.example.temperature;
2
3   public class ConverterUtil {
4       // converts to celsius
5       public static float convertFahrenheitToCelsius(float fahrenheit) {
6           return ((fahrenheit - 32) * 5 / 9);
7       }
8
9       // converts to fahrenheit
10      public static float convertCelsiusToFahrenheit(float celsius) {
11          return ((celsius * 9) / 5) + 32;
12      }
13  }
```

마지막으로 MainActivity.java 코드입니다.

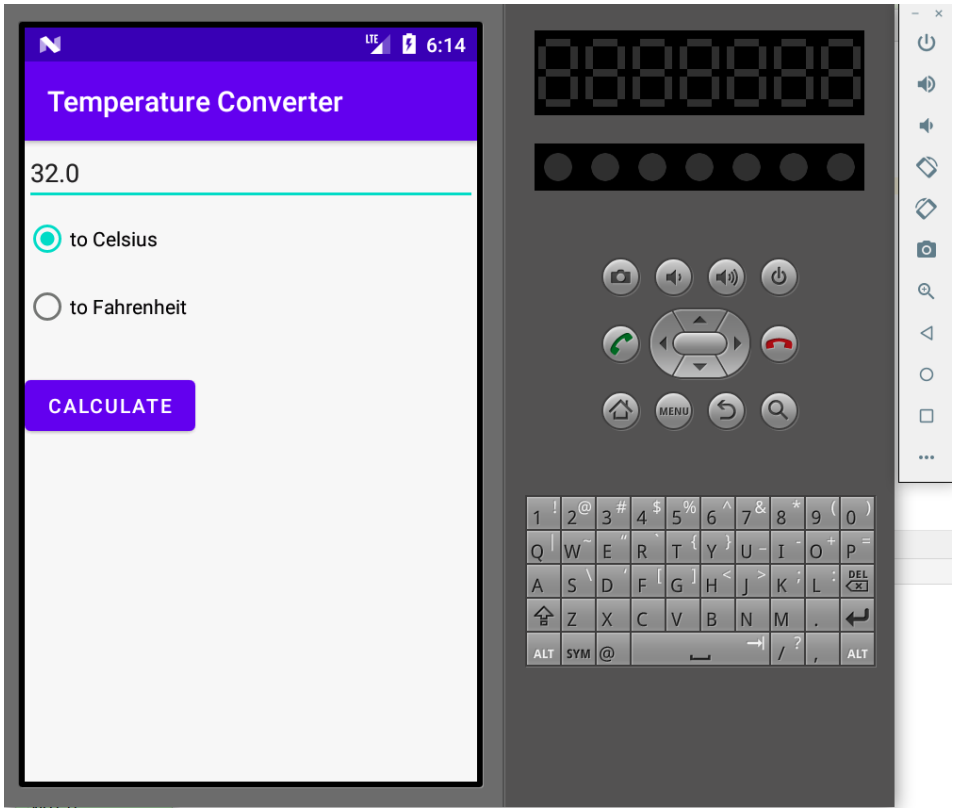
activity_main.xml × strings.xml × v24/ic_launcher_foreground.xml × MainActivity.java

```java
package com.example.temperature;

import androidx.appcompat.app.AppCompatActivity;
import android.os.Bundle;
import android.app.Activity;
import android.view.View;
import android.widget.EditText;
import android.widget.RadioButton;
import android.widget.Toast;


```

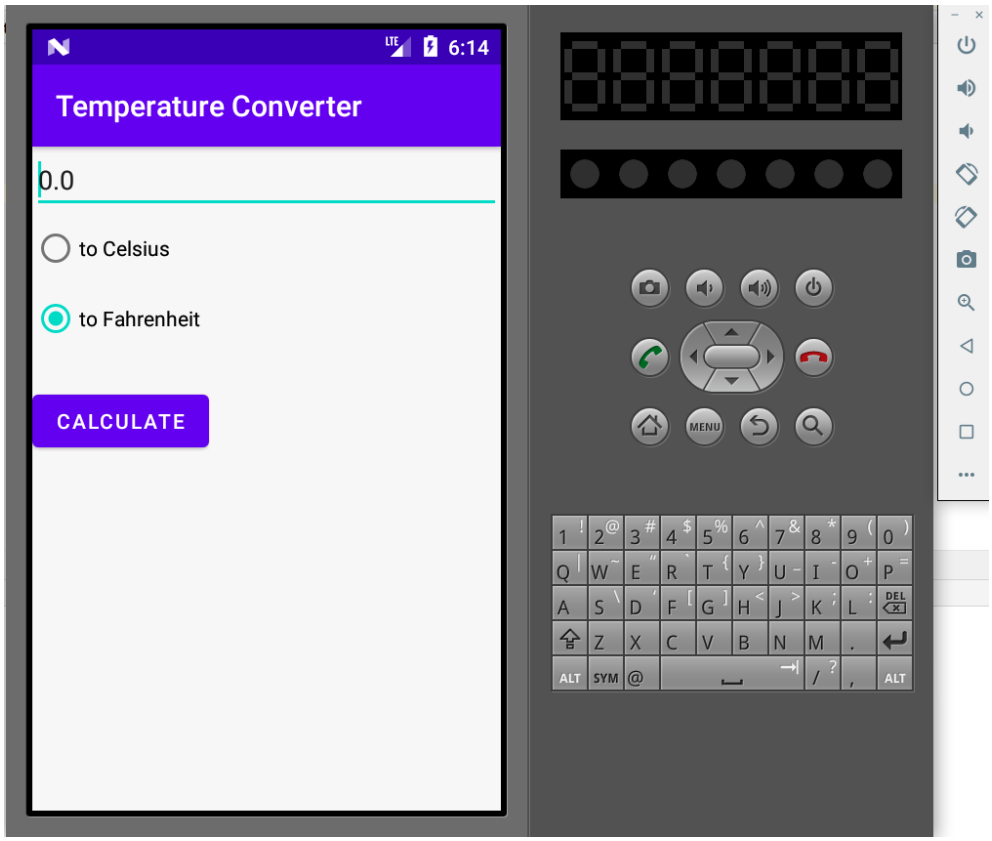
activity_main.xml × strings.xml × v24/ic_launcher_foreground.xml × MainActivity.java ×

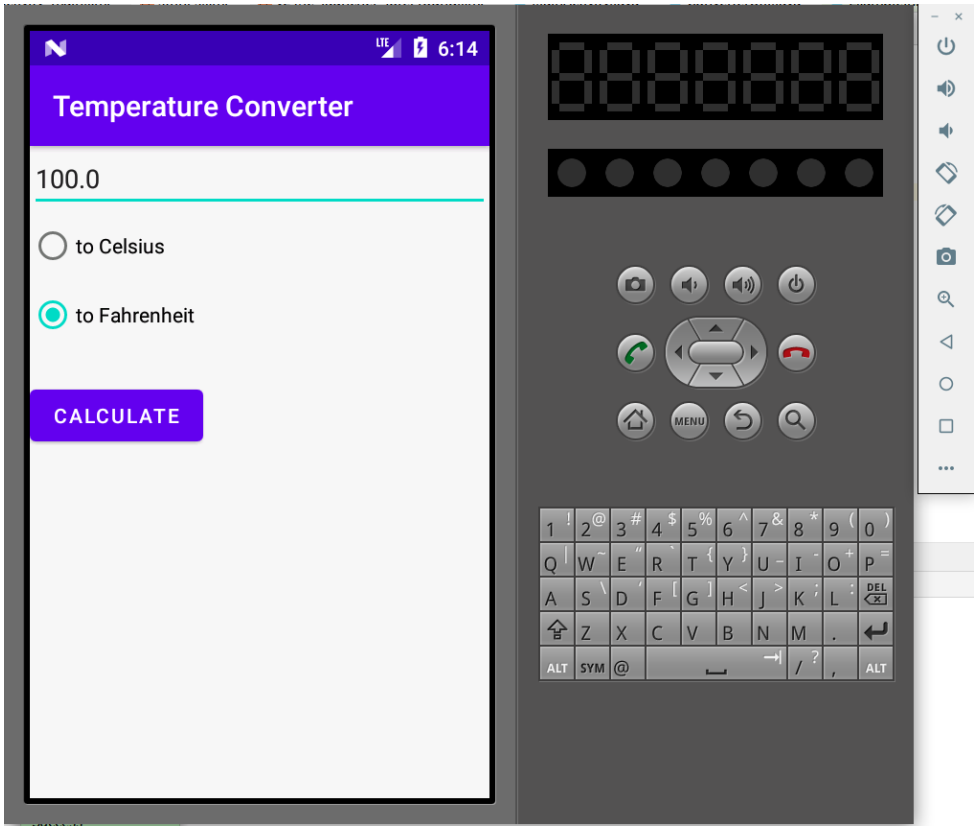
```java

public class MainActivity extends AppCompatActivity {
    private EditText text;

    @Override
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        text = (EditText) findViewById(R.id.inputValue);

    }

    // this method is called at button click because we assigned the name to the
    // "OnClick" property of the button
    public void onClick(View view) {
        switch (view.getId()) {
            case R.id.button1:
                RadioButton celsiusButton = (RadioButton) findViewById(R.id.radio0);
                RadioButton fahrenheitButton = (RadioButton) findViewById(R.id.radio1);
                if (text.getText().length() == 0) {
                    Toast.makeText( context: this, text: "Please enter a valid number",
                            Toast.LENGTH_LONG).show();
                    return;
                }

                float inputValue = Float.parseFloat(text.getText().toString());
                if (celsiusButton.isChecked()) {
                    text.setText(String
                            .valueOf(ConverterUtil.convertFahrenheitToCelsius(inputValue)));
                    celsiusButton.setChecked(false);
                    fahrenheitButton.setChecked(true);
                } else {
                    text.setText(String
                            .valueOf(ConverterUtil.convertCelsiusToFahrenheit(inputValue)));
                    fahrenheitButton.setChecked(false);
                    celsiusButton.setChecked(true);
                }
                break;
        }
    }

}
```

실행화면입니다.



$32^oF \rightarrow 0^oC$





$100^oC \rightarrow 212^oF$