

## Android Studio Debugging

本篇教學除了最基本的中斷點教學之外，還有條件式中斷的教學。

條件式中斷是進階的除錯技巧，在某些特定情況中，我們有一個函數可能會被呼叫數次，但是我們只希望在某種條件成立時才進行中斷，進而觀察變數的狀態。而條件式中斷這項技巧正是符合這項需求。

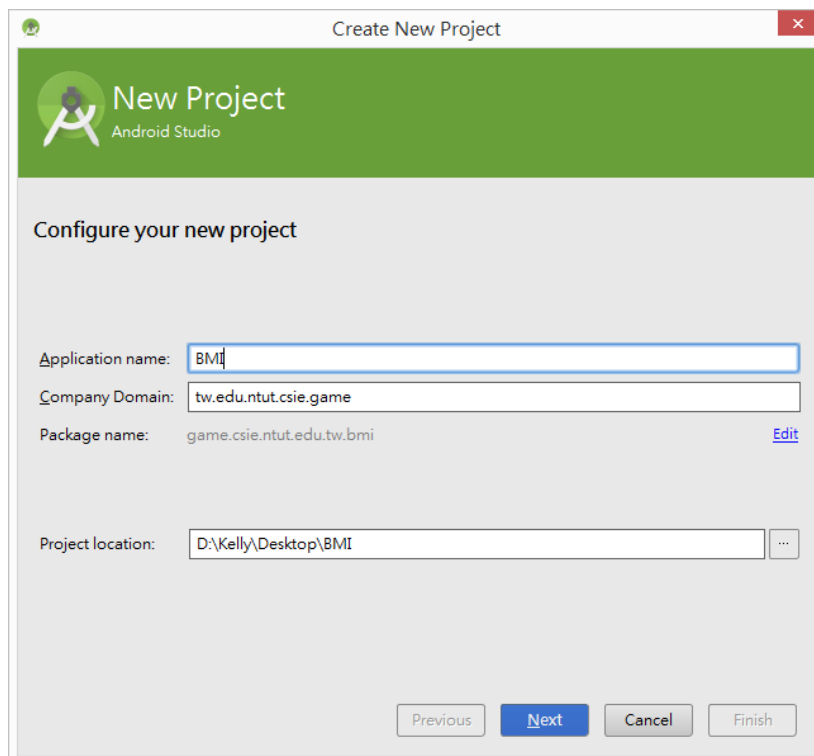
本教學分兩部分

- 單步除錯(Page2~11, 共 10)
- 條件式中斷點(Page12~17, 共 6)

## 單步除錯(1/10)

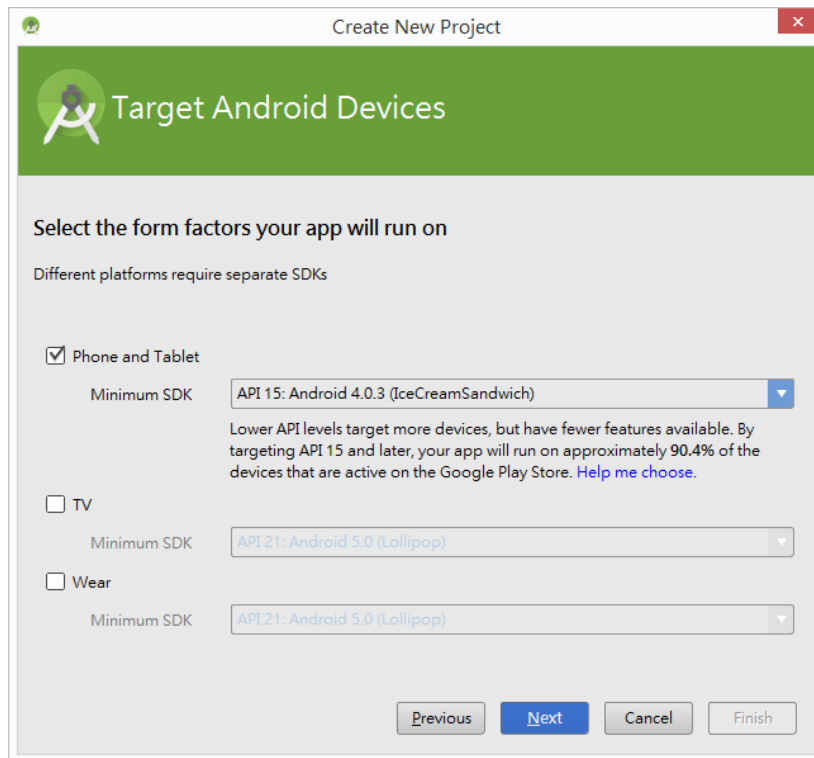


打開 Android Studio ，點選 Start a new Android Studio project 建立專案

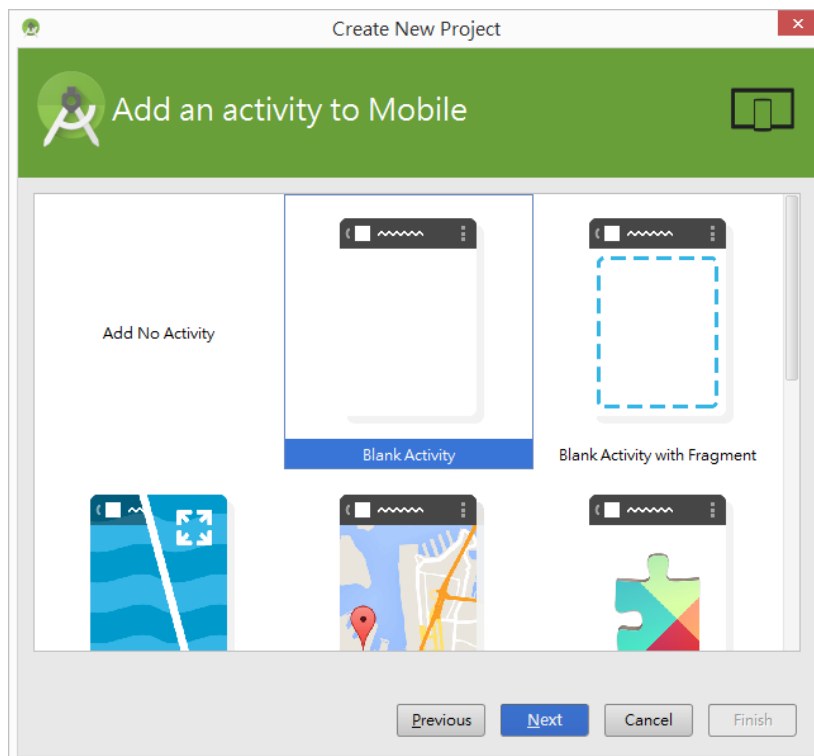


Application name 輸入 BMI 點下 Next

## 單步除錯(2/10)

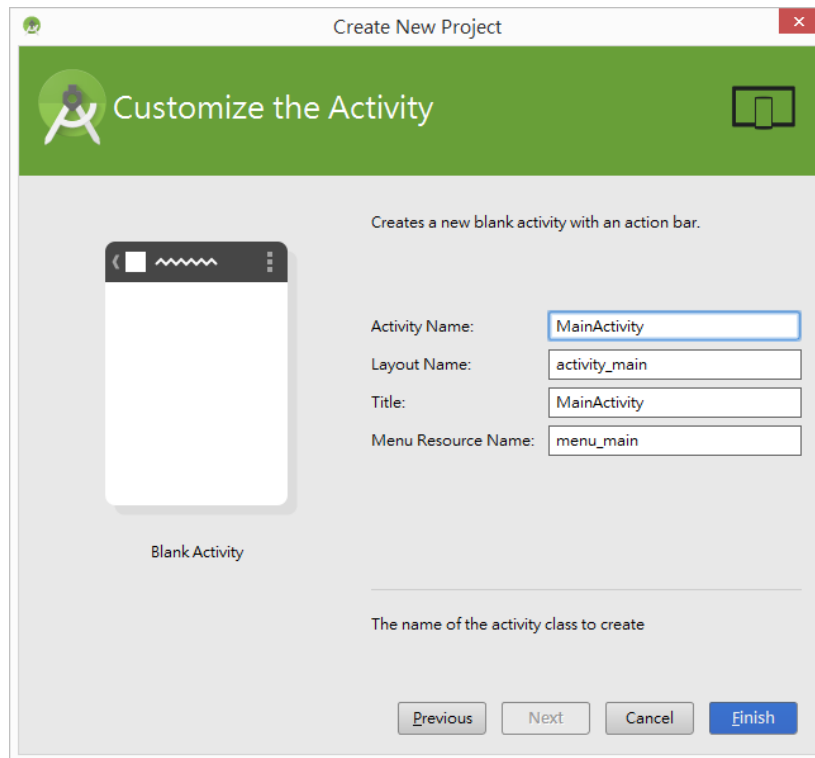


點下Next

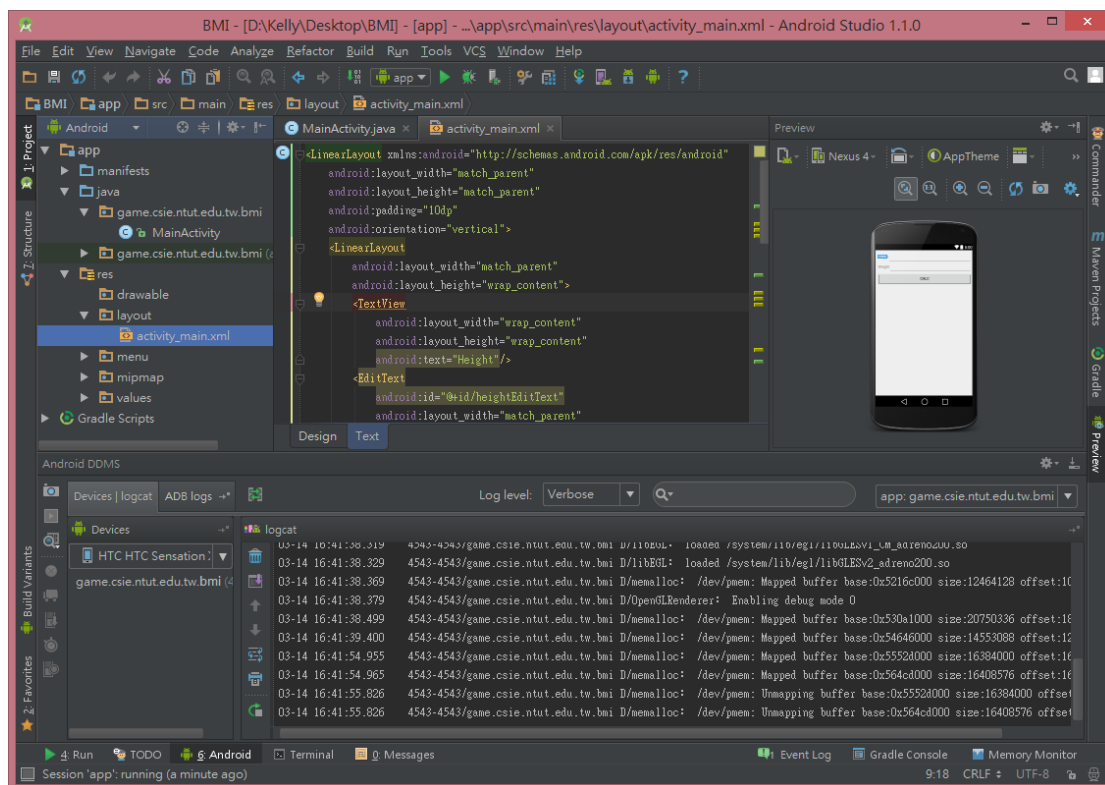


Next

## 單步除錯(3/10)



Finish，這邊需要等候一下

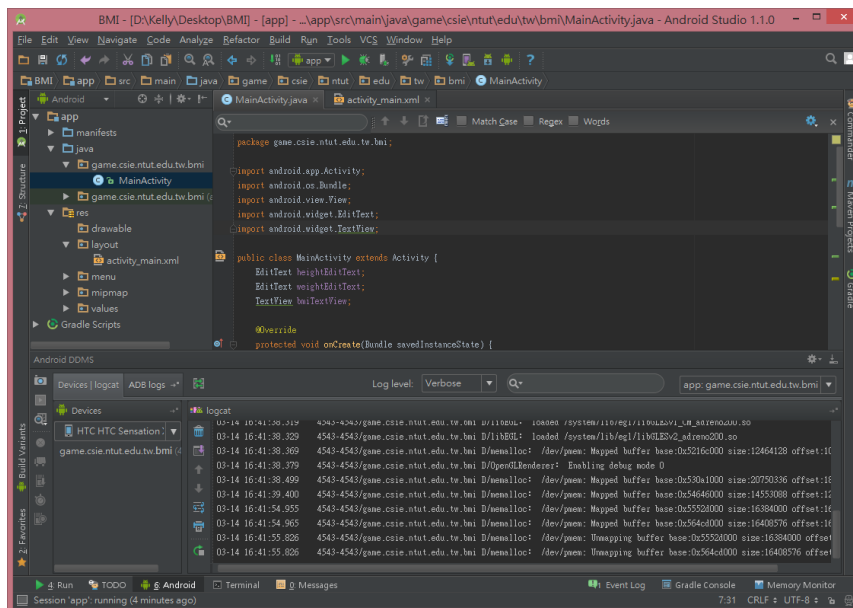


請在 res/layout/activity\_main.xml 填入下頁的程式碼

## 單步除錯(4/10)

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="10dp"
    android:orientation="vertical">
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Height"/>
        <EditText
            android:id="@+id/heightEditText"
            android:layout_width="match_parent"
            android:layout_height="wrap_content" />
        </LinearLayout>
    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">
        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Weight"/>
        <EditText
            android:id="@+id/weightEditText"
            android:layout_width="match_parent"
            android:layout_height="wrap_content" />
    </LinearLayout>
    <Button
        android:id="@+id/calcButton"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:text="Calc"
        android:onClick="clickButton"/>
    <TextView
        android:id="@+id/bmiTextView"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"/>
</LinearLayout>
```

## 單步除錯(5/10)



在java/MainActivity 填入以下程式碼，你可能要適時地修改 package 名稱

**package game.csie.ntut.edu.tw.bmi;**

```
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
import android.widget.TextView;
```

```
public class MainActivity extends Activity {
    EditText heightEditText;
    EditText weightEditText;
    TextView bmiTextView;
```

**@Override**

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

```
    heightEditText = (EditText) findViewById(R.id.heightEditText);
    weightEditText = (EditText) findViewById(R.id.weightEditText);
    bmiTextView = (TextView) findViewById(R.id.bmiTextView);
```

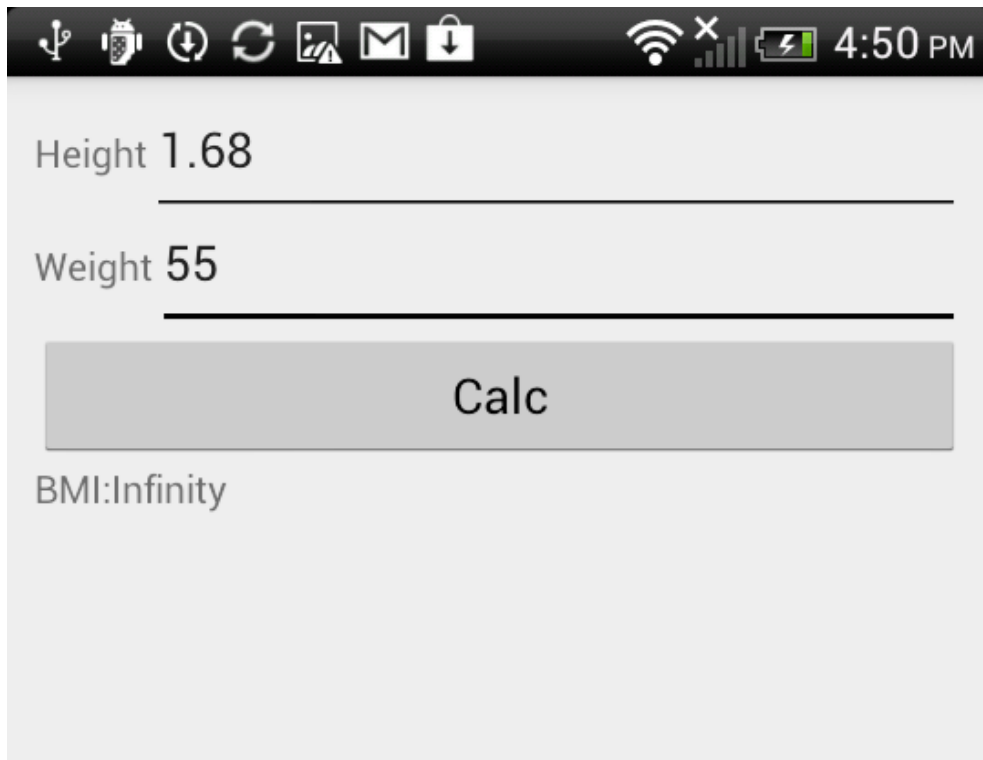
```
}
```

```
public void clickButton(View view){
    double height = 0, weight= 0;
    double bmi;
    height = Double.parseDouble(heightEditText.getText().toString());
    bmi = weight / (height * height);
    bmiTextView.setText("BMI:" + bmi);
```

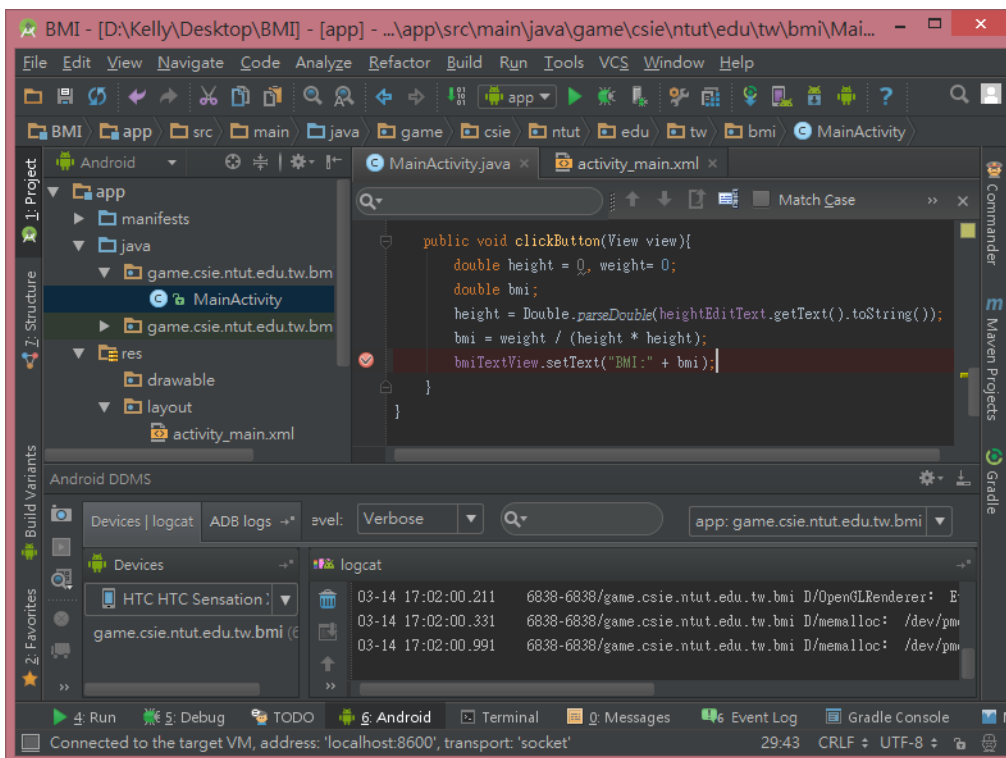
```
}
```

```
}
```

## 單步除錯(6/10)

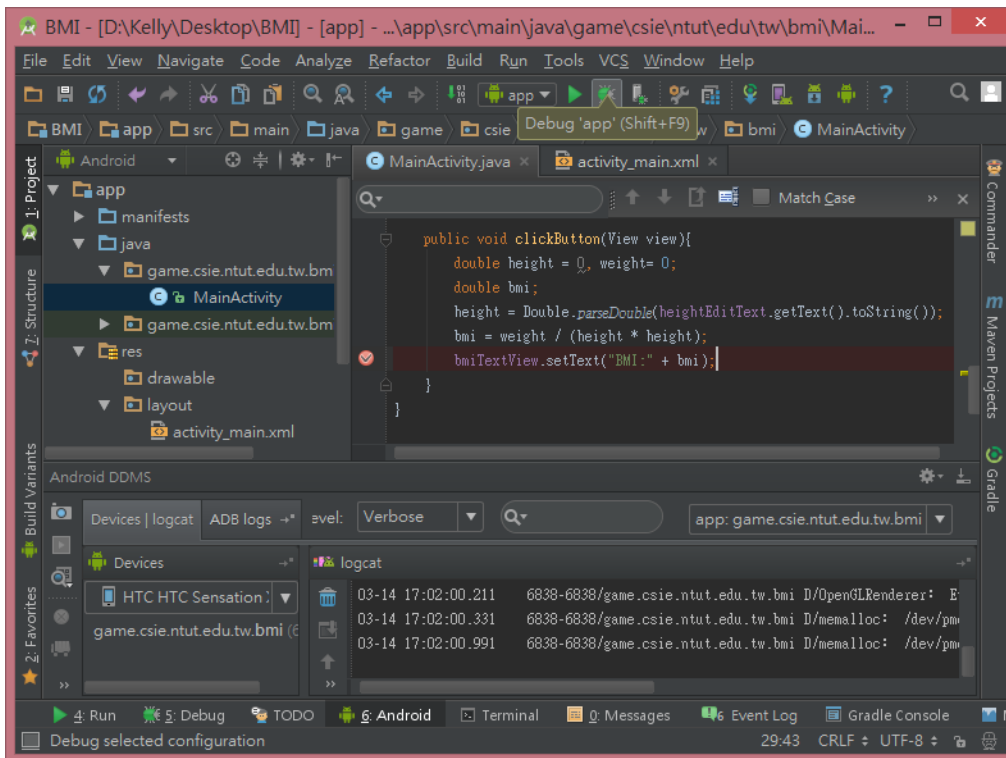


執行專案發現執行結果錯誤，開始進行 Debug

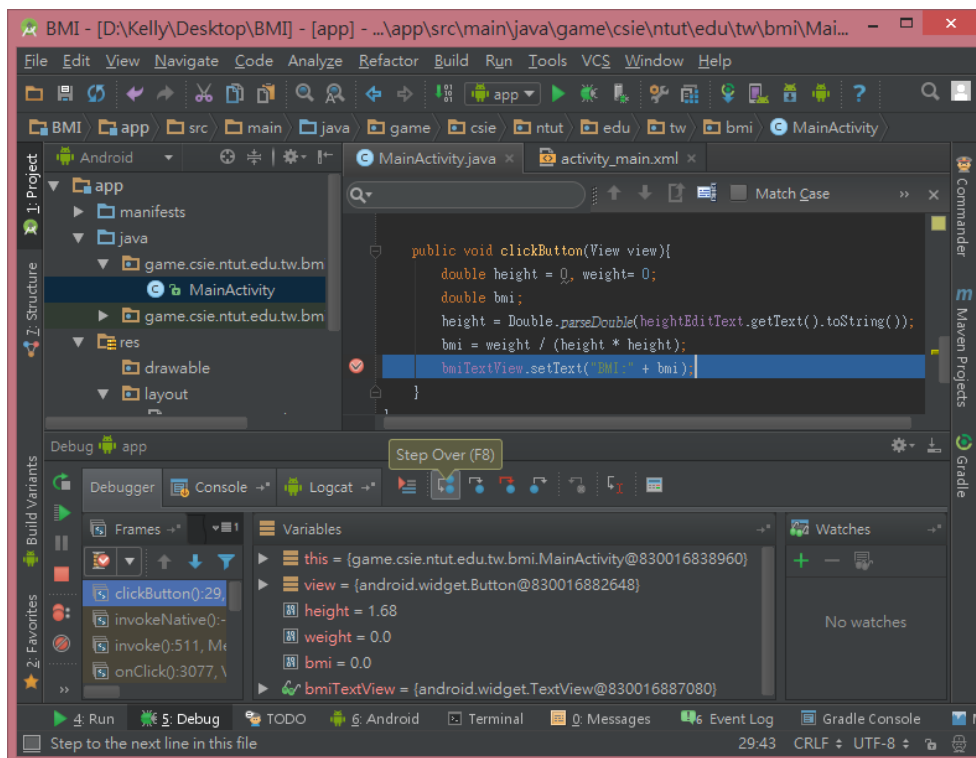


點擊 bmiTextView.... 這一行的左方，開啟中斷點

## 單步除錯(7/10)



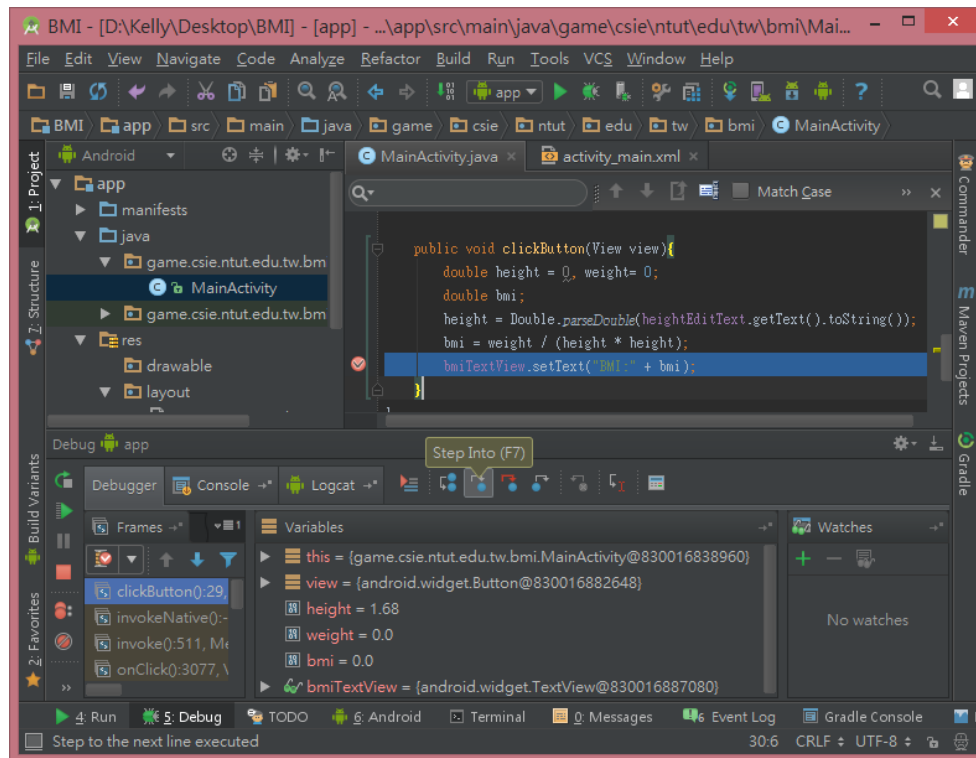
使用 Debug 來進行除錯



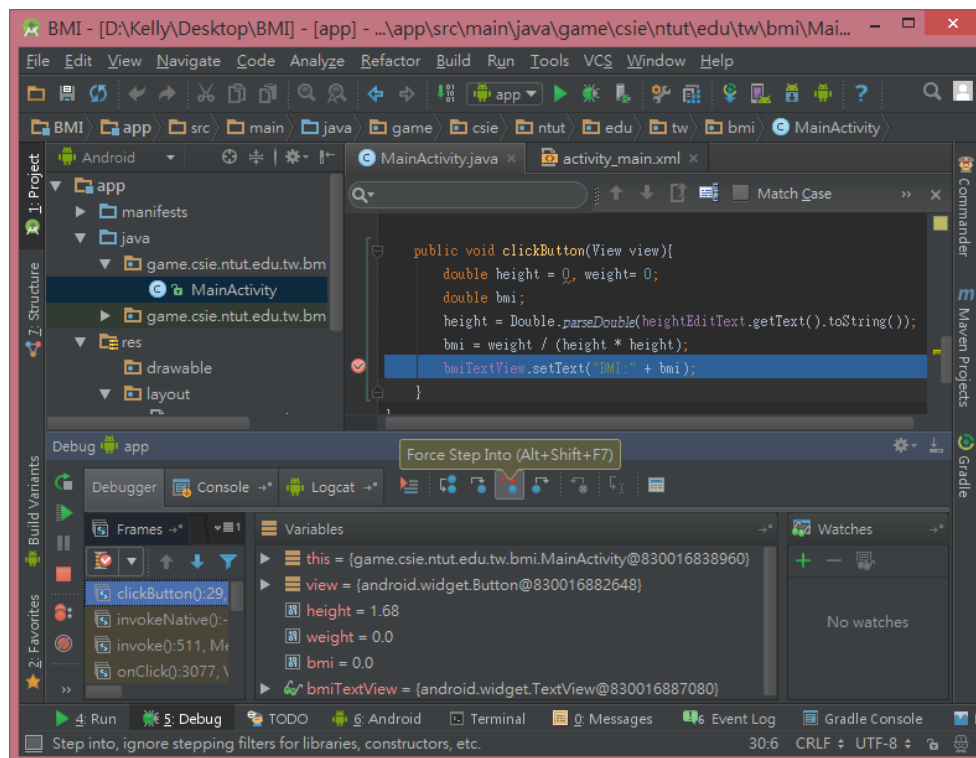
使用 Step Over(F8)可直接跳過一行



## 單步除錯(8/10)

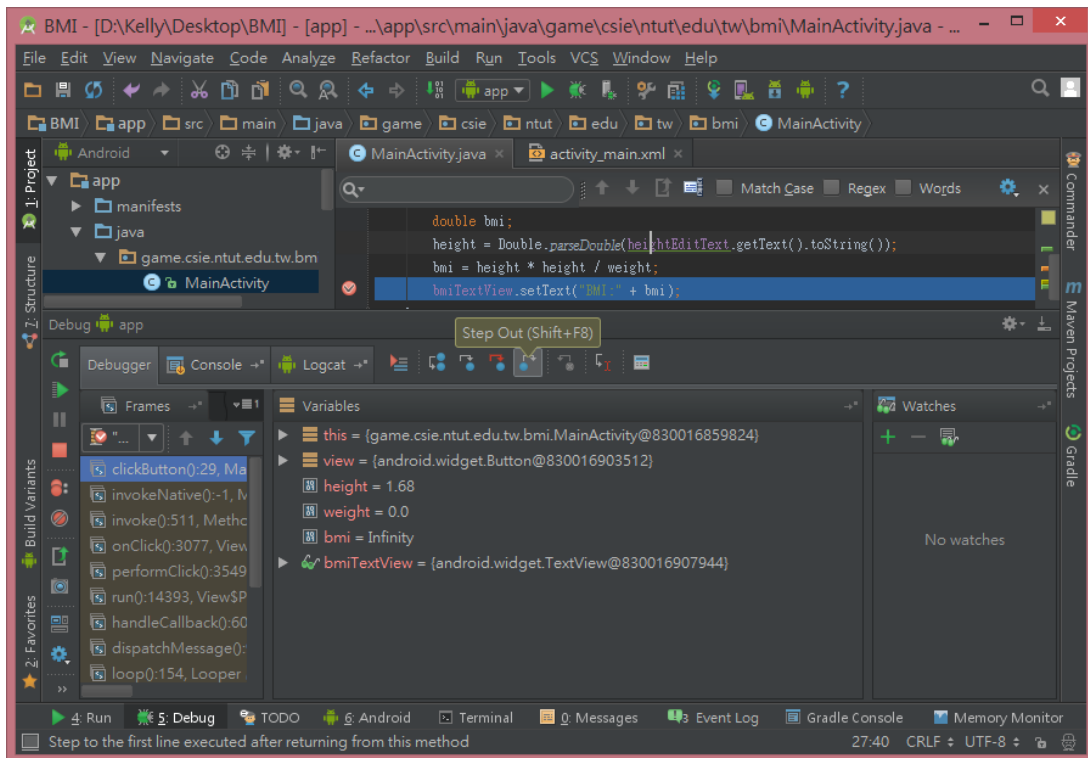


使用 Step Into(F7) 可進入函數內部

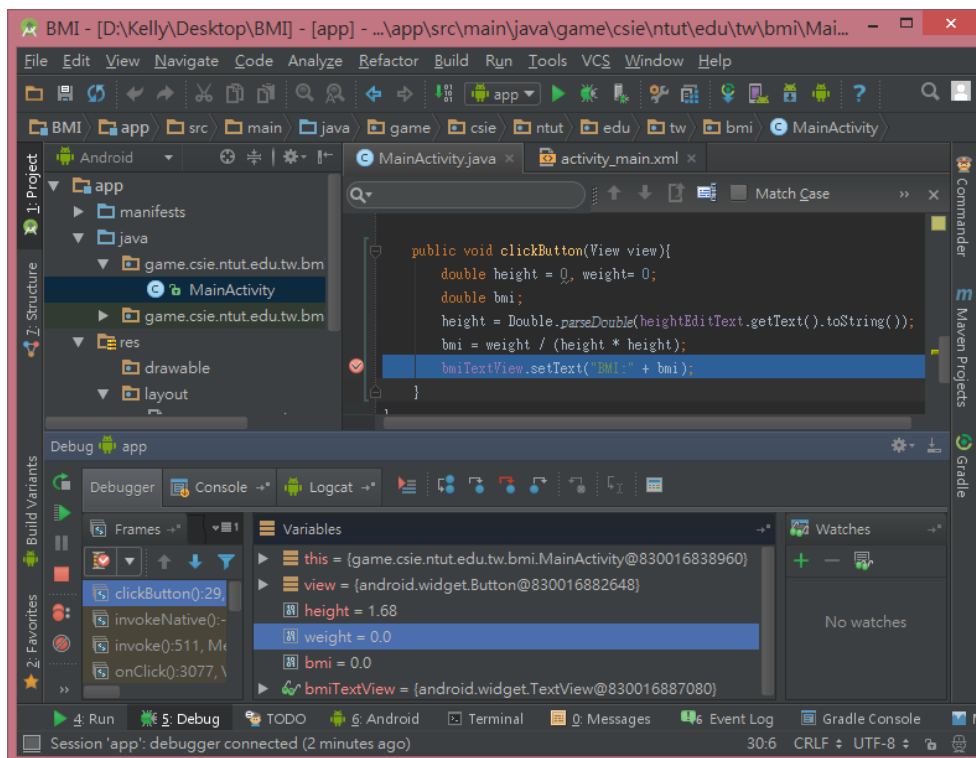


使用 Force Step Into(Alt+Shift+F7) 可強制進入函數

## 單步除錯(9/10)

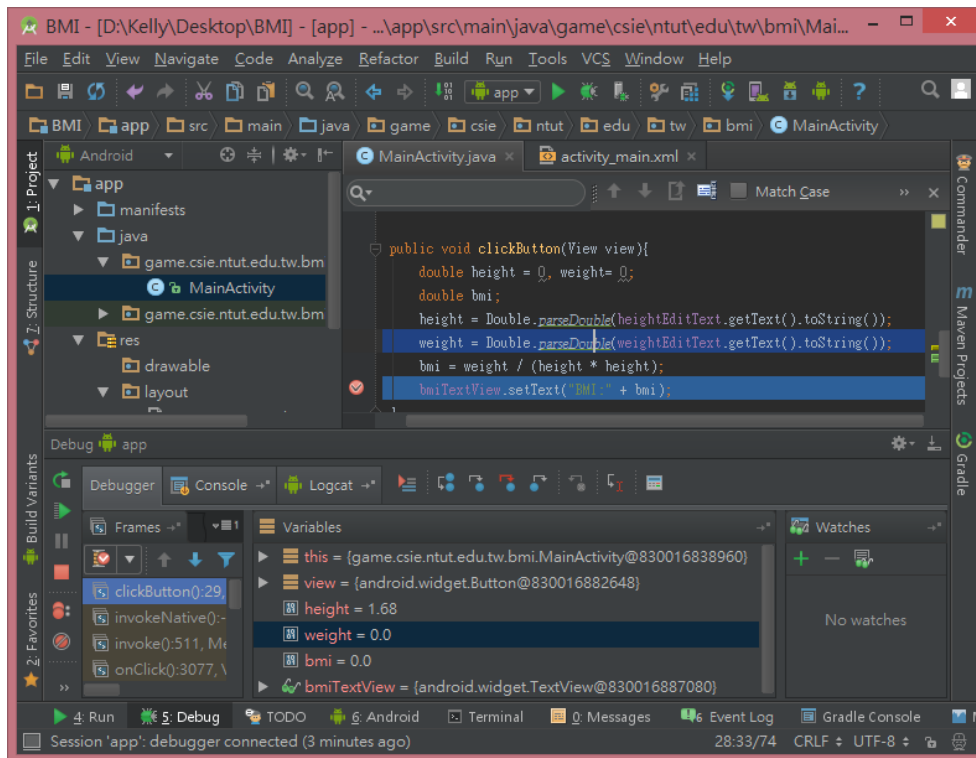


使用 Step Out(Shift+F8) 可直接跳出函數

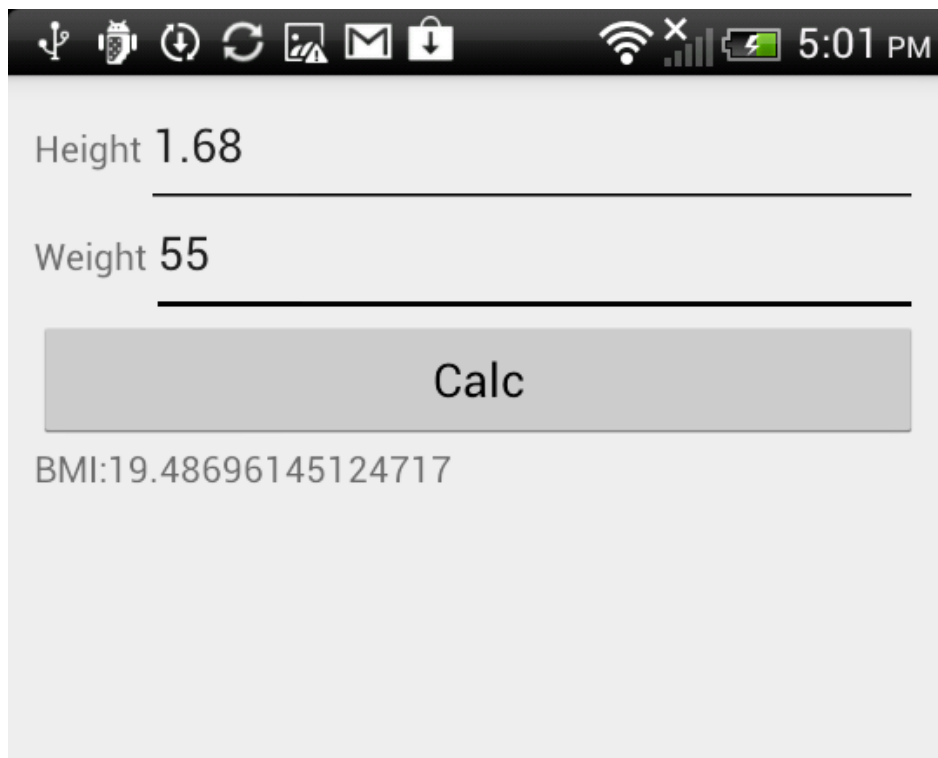


我們觀看下方 Variables 視窗，可發現 weight 的值=0，需要進行修改

## 單步除錯(10/10)

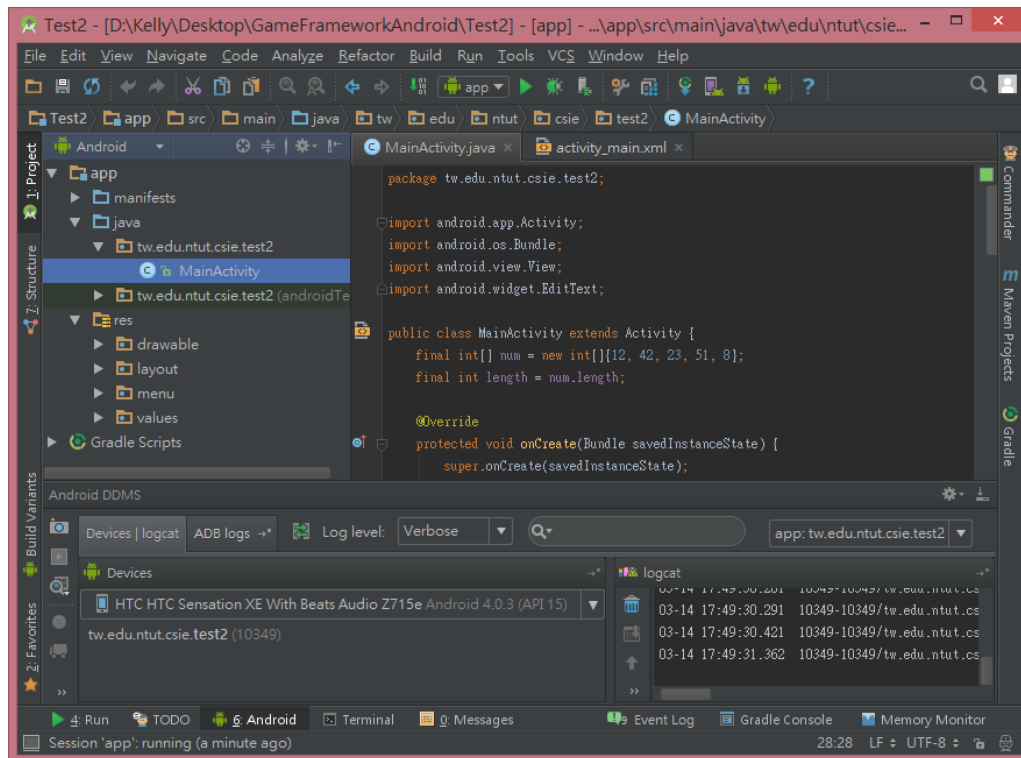


加入程式碼 `weight = Double.parseDouble(weightEditText.getText().toString());`;

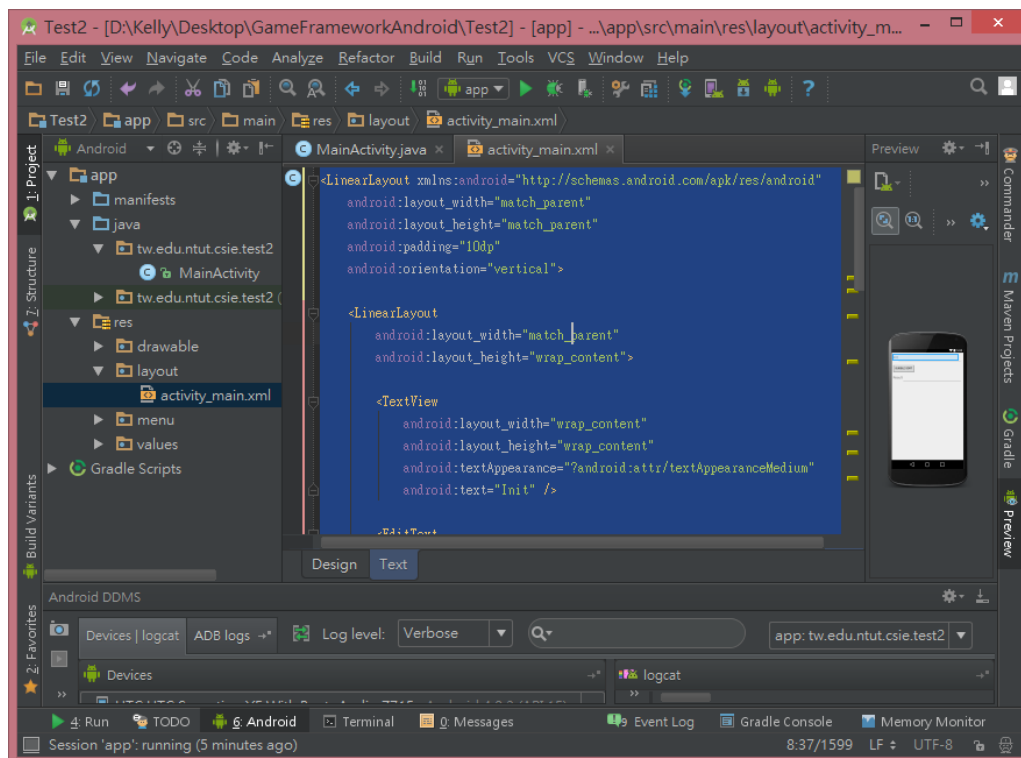


成功

## 條件式中斷點(1/6)



請仿造前一個範例建立一個專案



請在 res/layout/activity\_main.xml 填入下頁的程式碼

## 條件式中斷點(2/6)

```
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:padding="10dp"
    android:orientation="vertical">

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:textAppearance="?android:attr/textAppearanceMedium"
            android:text="Init" />

        <EditText
            android:id="@+id/initEditText"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:editable="false"/>
    </LinearLayout>

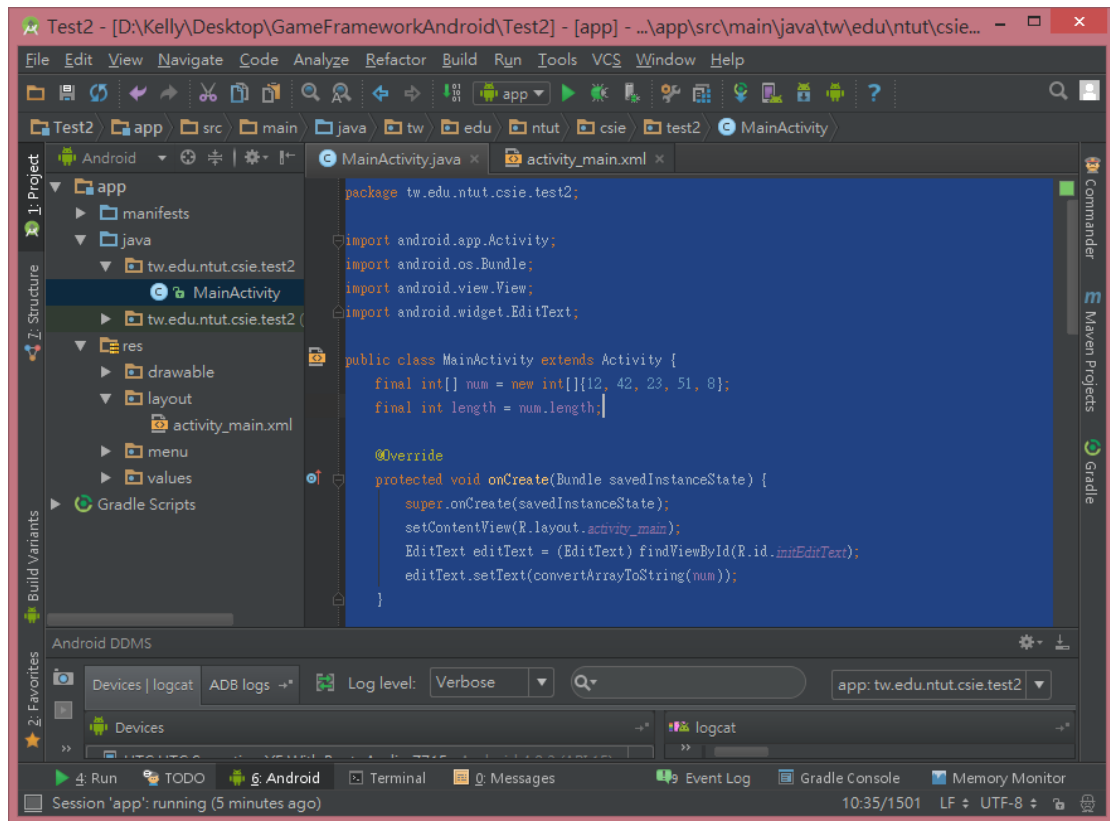
    <Button
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp"
        android:text="Bubble Sort"
        android:onClick="sortButtonClick"/>

    <LinearLayout
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_marginTop="10dp">

        <TextView
            android:layout_width="wrap_content"
            android:layout_height="wrap_content"
            android:text="Result"
            android:textAppearance="?android:attr/textAppearanceMedium" />

        <EditText
            android:id="@+id/resultEditText"
            android:layout_width="match_parent"
            android:layout_height="wrap_content"
            android:editable="false" />
    </LinearLayout>
</LinearLayout>
```

## 條件式中斷點(3/6)



在 java/MainActivity 填入下頁程式碼，你可能要適時地修改 package 名稱

## 條件式中斷點(4/6)

```
package tw.edu.ntut.csie.test2;
```

```
import android.app.Activity;
import android.os.Bundle;
import android.view.View;
import android.widget.EditText;
```

```
public class MainActivity extends Activity {
    final int[] num = new int[]{12, 42, 23, 51, 8};
    final int length = num.length;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        EditText editText = (EditText) findViewById(R.id.initEditText);
        editText.setText(convertArrayToString(num));
    }

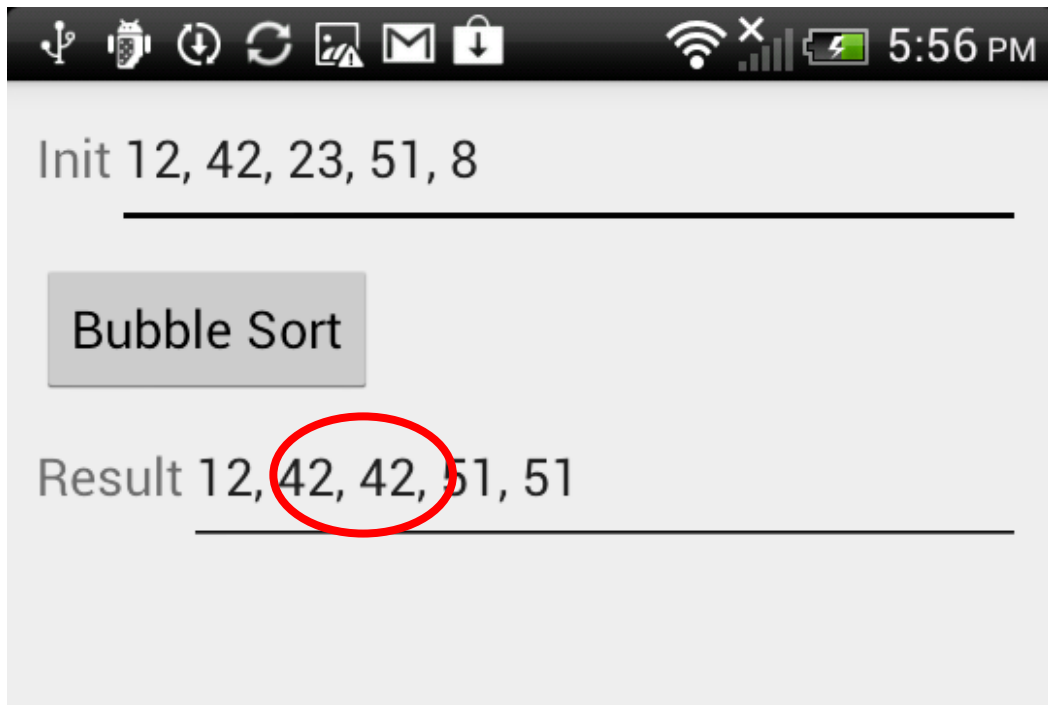
    public void sortButtonClick(View v) {
        bubbleSort(num, length);
        EditText resultEditText = (EditText) findViewById(R.id.resultEditText);
        resultEditText.setText(convertArrayToString(num));
    }

    private String convertArrayToString(int[] num) {
        String result = "";
        for (int i : num) {
            if (result.equals(""))
                result = i + "";
            else
                result += ", " + i;
        }
        return result;
    }

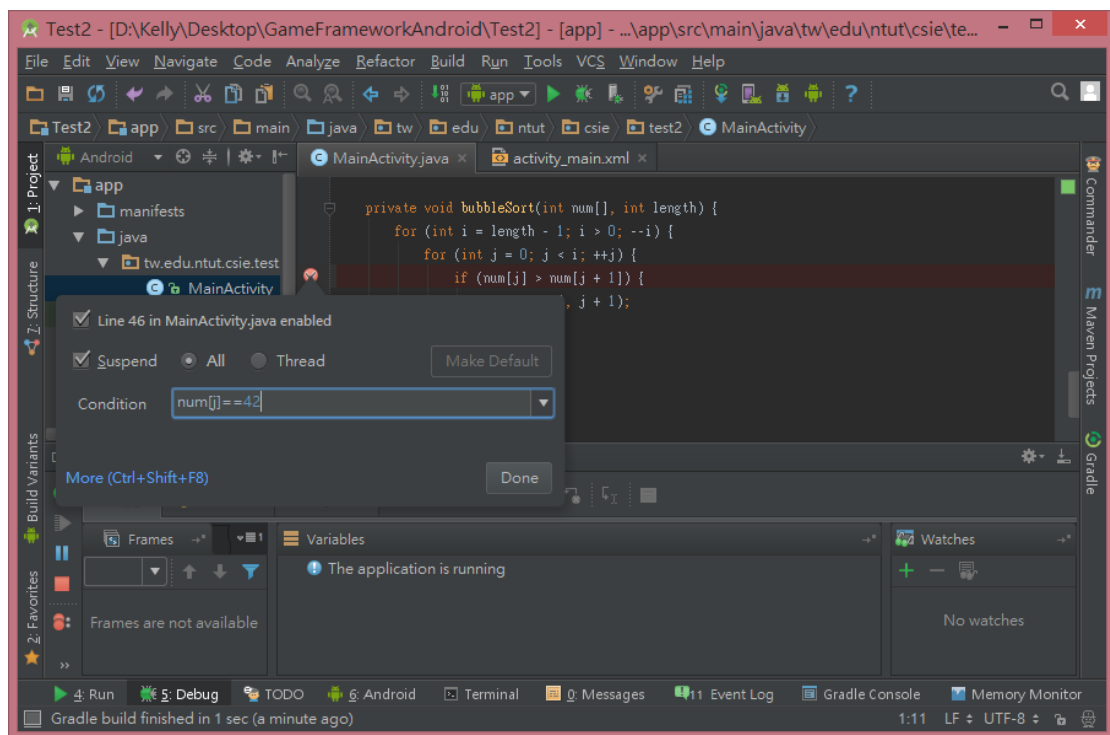
    private void swap(int num[], int indexA, int indexB) {
        int tmp = num[indexA];
        num[indexB] = num[indexA];
        num[indexA] = tmp;
    }

    private void bubbleSort(int num[], int length) {
        for (int i = length - 1; i > 0; --i) {
            for (int j = 0; j < i; ++j) {
                if (num[j] > num[j + 1]) {
                    swap(num, j, j + 1);
                }
            }
        }
    }
}
```

## 條件式中斷點(5/6)



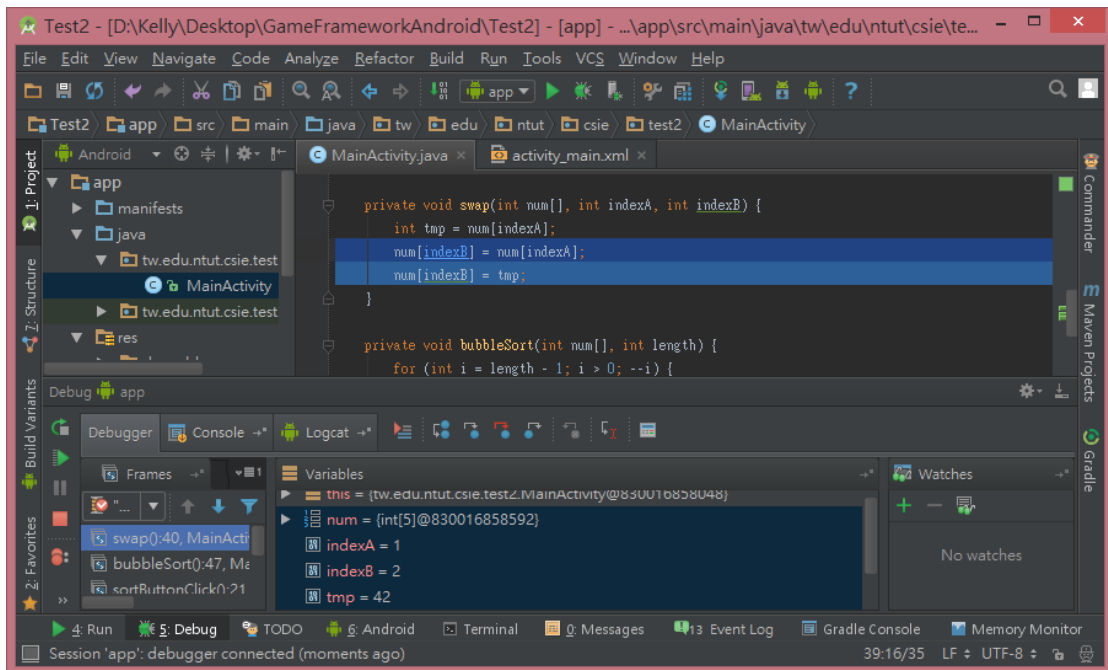
執行專案發現結果有錯誤，開始進行除錯。



在if敘述下中斷點，並且在中斷點按下右鍵，輸入我們想要停下的條件  
`num[j]==42`，待條件成立，程式將會暫停

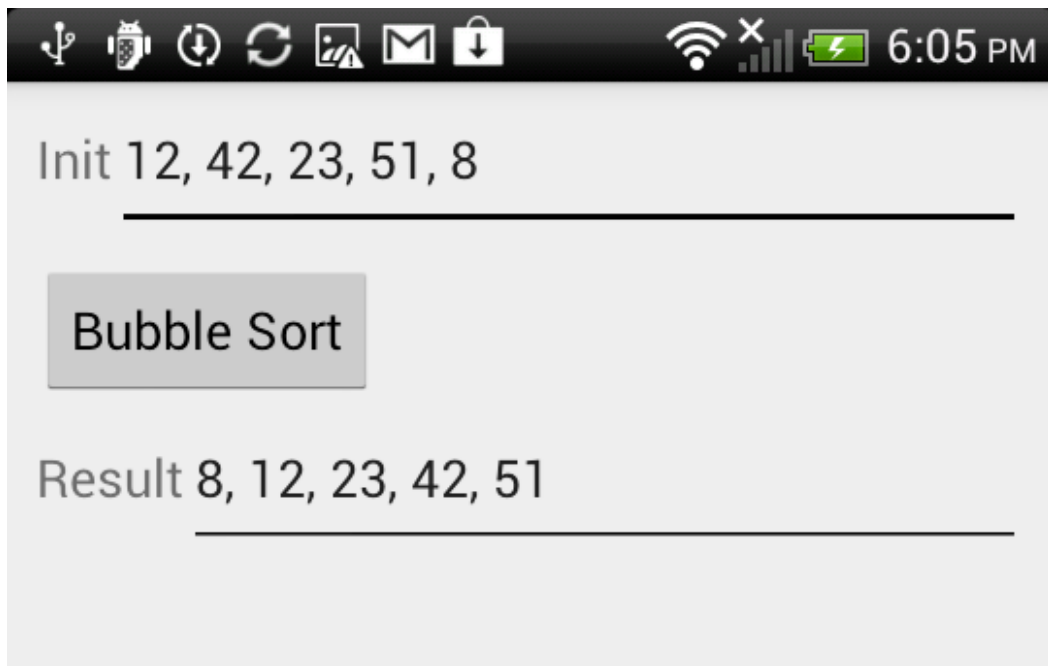


## 條件式中斷點(6/6)



執行後我們發現是 swap 函數出了錯誤，將程式碼修改如下：

```
private void swap(int num[], int indexA, int indexB) {  
    int tmp = num[indexA];  
    num[indexA] = num[indexB];  
    num[indexB] = tmp;  
}
```



成功