### 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)

ø		Android Studio – 🗆 🗙		
	We	elcome to Android Studio		
R	ecent Projects	Quick Start		
		Start a new Android Studio project		
		Open an existing Android Studio project		
No F	Project Open Yet	Import an Android code sample		
		Check out project from Version Control		
		Import project (Eclipse ADT, Gradle, etc.)		
		Configure	⇒	
		Docs and How-Tos	⇔	
Android S		740770 Charle for underso now		

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

<u>@</u>	Create New Project ×
New Android S	Project
Configure your	new project
Application name:	BM
<u>C</u> ompany Domain:	tw.edu.ntut.csie.game
Package name:	game.csie.ntut.edu.tw.bmi <u>Edit</u>
Project location:	D:\Kelly\Desktop\BMI
	Previous <u>N</u> ext Cancel Finish

# 單步除錯(2/10)

<b>@</b>	Create New Project ×		
Target Android Devices			
Select the form fac	tors your app will run on		
Different platforms requi	e separate SDKs		
✓ Phone and Tablet			
Minimum SDK	API 15: Android 4.0.3 (IceCreamSandwich)		
	Lower API levels target more devices, but have fewer features available. By targeting API 15 and later, your app will run on approximately 90.4% of the devices that are active on the Google Play Store. Help me choose.		
Minimum SDK	API 21: Android 5.0 (Lollipop)	-	
🗌 Wear			
Minimum SDK	API 21: Android 5.0 (Lollipop)	-	
	Previous Next Cancel Finish	1	

點下Next

<u>@</u>	Create New Project ×		
Add an activ	vity to Mobile		
Add No Activity	( 🗖 : Blank Activity	Blank Activity with Fragment	
	Previous	Cancel Finish	

Next

### 單步除錯(3/10)

•	Create New Project ×		
Customize the	Activity		
( <b>_</b> ~~~~ :	Creates a new blank acti	vity with an action bar.	
	Activity Name:	MainActivity	
	Layout Name:	activity_main	
	Title:	MainActivity	
	Menu Resource Name:	menu_main	
Blank Activity			
	The name of the activity	class to create	
	Previous N	ext Cancel <u>Finish</u>	

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());

v 🍺 () C 🗔 M 🗘	🛜 × 🖅 5:01 рм
Height 1.68	
Weight 55	
Calc	
BMI:19.48696145124717	
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[indexB] = 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;
}

1 🖗 🕀 🖓 🕼	MÎ	🛜 × 🖅 6:05 рм
Init 12, 42, 23,	51, 8	
Bubble Sort		
Result 8, 12, 23, 42, 51		
	成功	