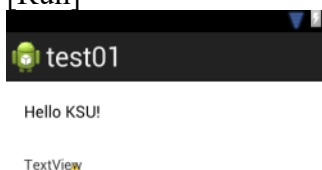# 3. Basic Components
3.1 TextView

(1). TextView
- Usage
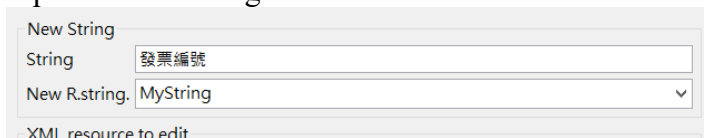 - ➢ [FormWidgets] – [TextView] to [Outline]
  - ➢ Under [RelativeLayout]
  - ➢ Text: TextView (default – with **warning**)
  - ➢ [Run]

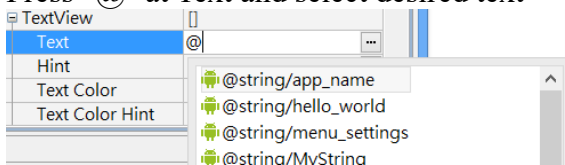- Remove the {**Warning**}
  - ➢ Press [...] (Text)
  - ➢ Press [New String]
  - ➢ Input the Following

  - ➢ Press [OK]
  - ➢ [Run]

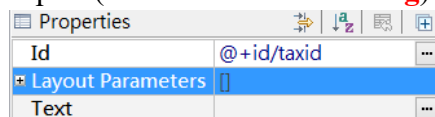 - ➢ Select Text
    Press "@" at Text and select desired text

- Set Value
  - ➢ Usage
    TextView str2 = (TextView) findViewById(R.id.textView3);
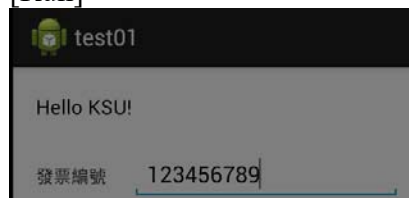   str2.setText("Hello!!");
    ...

(2). EditText

- ■ Usage
  - ➢ [FormWidgets] – [TextView] to [Outline]
  - ➢ Under [RelativeLayout]
  - ➢ Id: changed to @+id/taxid
  - ➢ Input: (default – with **warning**)

- ■ Remove the {**Warning**}
  - ➢ Press [InputType]
  - ➢ Select [text] (for input type)
  - ➢ [Run]

- ■ Get Values
  - ➢ Usage
    EditText str1 = (EditText) findViewById(R.id.taxid);
    String str2 = str1.getText().toString();
    ...

- ■ Example:
  請問 TextFields 與 TextView 有何不同?
  答:
       TextView 用於顯示字串
       TextFileds 用於輸入字串

  - ➢ **Events – onKey**
    ```
    private EditText etSex;
    public void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.main);

        etSex = (EditText)findViewById(R.id.etIdSex);
        etSex.setOnKeyListener(btListener);
    }
    private OnClickListener btListener = new OnClickListener() {
        public void onClick(View v) {
            CharSequence csName=etName.getText();
    ```

```
                    CharSequence csSex=etSex.getText();
                    String st=new String();
                    if (csSex.toString().equals("male")){
                        st=csName.toString()+"先生，你好!";
                    } else {
                        st=csName.toString()+"小姐，妳好!";
                    }
                    Toast.makeText(Ch05Button2.this, st,Toast.LENGTH_SHORT).show();
                }
            };
```

- **Input type**
  - android:layout_gravity="center_vertical"：顯示的位置 (top, middle, bottom)
  - android:hint="輸入數字！"
  - android:numeric="integer"：限制只能輸入整數 (小數是：decimal)
  - android:singleLine="true"：單行輸入，true:則文字不會自動換行
  - android:password="true"：輸入欄位以*呈現
  - android:textColor = "#ff8c00"
  - android:textStyle="bold"
  - android:textSize="20dip"
  - android:capitalize = "characters"：強制轉換為大寫
  - android:textColorHighlight="#cccccc"：字的底色
  - android:textColorHint="#ffff00"：提示訊息文字顏色
  - android:textScaleX="1.5"：字與字間距
  - android:typeface="monospace" (normal, sans, serif, monospace)
  - android:background="@null" (透明 : none)
  - android:layout_weight="1"：元件間的權重
  - android:inputType="number" (僅允許輸入 0~9)
  - android:inputType="numberSigned"
  - android:inputType="numberDecimal"
  - android:inputType="phone" (電話號碼)
  - android:inputType="datetime"
  - android:inputType="date" (日期型態，數字或斜線)
  - android:inputType="time" (時間型態，數字、分號與 P、A、M)

(3). Multiline Text

- Usage
  - [FormWidgets] – [Multiline Text] to [Outline]

- ➤ Under [RelativeLayout]
- ➤ Id: changed to @+id/mytextid
- ➤ Input Type: textMultiLine
- ■ Get Values
    - ➤ Usage
      EditText str1 = (**EditText**) findViewById(R.id.mytextid);
      String str2 = str1.getText().toString();
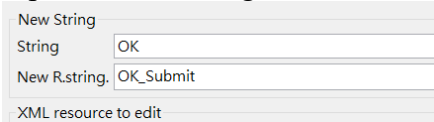   ...
    - ➤ Append Text
      str1.**append**("text");
      ...

3.2　Button

(1).　Button
- ■ Usage
    - ➤ **activity_main.xml**
      android:onClick="but_exit"
    - ➤ **MainActivity.java**
      ```
      public class MainActivity extends AppCompatActivity {
          @Override
          protected void onCreate(Bundle savedInstanceState) {
              ...
          }
          public void but_exit(View v){
              Toast toast = Toast.makeText(this, "按下離開按鈕", Toast.LENGTH_SHORT);
              toast.show();
          }
      }
      ```
- ■ Remove the {**Warning**}
    - ➤ Press [...] (Text)
    - ➤ Press [New String]
    - ➤ Input the Following

New String	
String	OK
New R.string.	OK_Submit
XML resource to edit	

    - ➤ Press [OK]
    - ➤ [Run]

test01

Hello KSU!

發票編號　_____

OK

(2). Events

- **Events – 1**

```
public class MainActivity extends Activity implements OnClickListener {
    Button button;
    protected void onCreate(Bundle savedInstanceState) {
        ...
        // (2) Use
        button = (Button)findViewById(R.id.button1);
        button.setOnClickListener((OnClickListener) this);
    }
    // (1) Define
    public void onClick(View v){
        // code here
    }
}
```

- **Events – 2 (common)**

```
public class MainActivity extends Activity {
    Button button;
    protected void onCreate(Bundle savedInstanceState) {
        ...
        // (2) Use
        button = (Button)findViewById(R.id.button1);
        button.setOnClickListener(but_OK);
    }
    // (1) Define
    private OnClickListener but_OK = new OnClickListener(){
        public void onClick(View v) {
            // code here
        }
    };
}
```

- **Events – 3**

```
public class MainActivity extends Activity {
    protected void onCreate(Bundle savedInstanceState) {
        ...
        Button button = (Button)findViewById(R.id.button1);
        button.setOnClickListener(new OnClickListener(){
            public void onClick(View v) {
```

```
                but_ok(v);
            }
        });
    }
    public void but_ok(View v){
        // code here
    }
}
```

(3). Toast

- Show Message
  - Toast.makeText(this, "TEST STRING",Toast.LENGTH_SHORT).**show**();
  - Toast toast = Toast.makeText(this, "TEXT", Toast.LENGTH_SHORT);
    toast.show();
- Example
  Toast toast = Toast.makeText(this, "按鈕已經被點擊", Toast.LENGTH_SHORT);
  toast.show();

(4). 範例練習

- **Example:**
  請利用本節所介紹的觀念寫一個統一發票兌獎程式?

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

    Button button = (Button)findViewById(R.id.button1);
    button.setOnClickListener(but_OK);
}
private OnClickListener but_OK = new OnClickListener(){
    public void onClick(View v) {
        EditText str1 = (EditText) findViewById(R.id.taxid);
        TextView str2 = (TextView) findViewById(R.id.textView3);
        if (str1.getText().toString().equals("123"))
            str2.setText("ok");
        else
            str2.setText("no");
    }
};
```
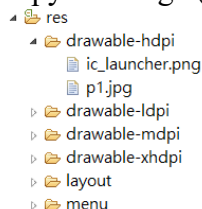
  - **Hint:**
    String str1 = "12345";
    str1.getText().toString().substring(0, 3) => "123"
  - Show Error Message (Toast) while keyin ERROR
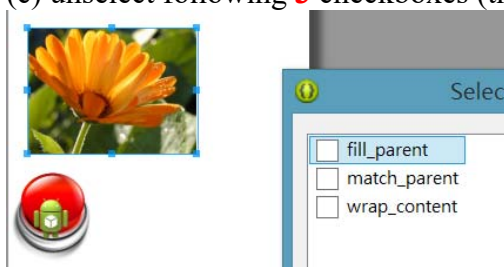
3.3　ImageView

(1).　Show Image

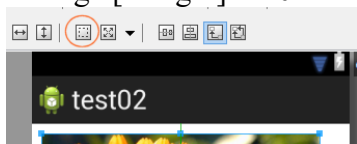- ■　Usage
  - ➤　Copy an image (p1.jpg) to res/drawable-hdpi

    ```
    ▲ 🗁 res
       ▲ 🗁 drawable-hdpi
            📄 ic_launcher.png
            📄 p1.jpg
       ▷ 🗁 drawable-ldpi
       ▷ 🗁 drawable-mdpi
       ▷ 🗁 drawable-xhdpi
       ▷ 🗁 layout
       ▷ 🗁 menu
    ```

  - ➤　Change Layout
    (a) Right click in [Screen]
    (b) Select [Change Layout]
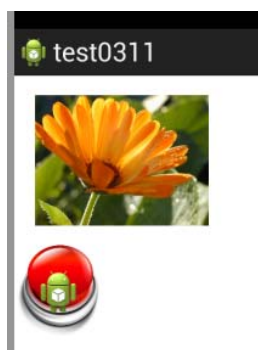   (c) Select [Relative Layout]

- ■　操作方式
  - ➤　Select [Image & Media] – [ImageView] (Under [Relative Layout])
  - ➤　Select the image "p1.jpg"
    Content Description: (default – with **warning**)
    the warning can be removed as previous description
    [define a string] – [select the string ID] ...
  - ➤　[adjustViewBounds] = true
  - ➤　Select ImageView
    (a) [Layout Parameter] – Width = 181dp
    (b) [Layout Parameter] – Height = 134dp
    (c) unselect following **3** checkboxes (the image can be resized)

  - ➤　Change [Margin] = 20

  - ➤　[Run]

(2). Load image file

- Usage
  ```
  Resources res = getResources();
  ImageView ivFlow = (ImageView)findViewById(R.id.imageView1);
  ivFlow.setImageDrawable(res.getDrawable(R.drawable.p1));
  ```

- **Example**
  (p1.jpg, button1)
  ```
  public class MainActivity extends Activity {
      private Button button;
      private ImageView ivFlow;
      protected void onCreate(Bundle savedInstanceState) {
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_main);

          ivFlow = (ImageView)findViewById(R.id.imageView1);
          button = (Button)findViewById(R.id.button1);
          button.setOnClickListener(new OnClickListener(){
              public void onClick(View v) {
                  Resources res = getResources();
                  ivFlow.setImageDrawable(res.getDrawable(R.drawable.p1));
              }
          });
      }
      ...
  }
  ```

(3). 範例練習:

- 範例:
  請指出下面程式的錯誤?
  ```
  01 ImageView ivFlow = (ImageView)findViewById(R.id.imageView1);
  02 Button button = (Button)findViewById(R.id.button1);
  03 button.setOnClickListener(new OnClickListener(){
  04        public void onClick(View v) {
  05                Resources res = getResources();
  ```

```
06                    ivFlow.setImageDrawable(R.drawable.p1);
07        }
08 })
```
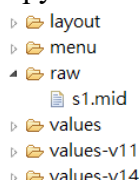
Ans: (1) 08: 少 ";"
　　　(2) 06: 改為 ivFlow.setImageDrawable(res.getDrawable(R.drawable.p1));

3.4　**MediaPlayer**

(1). Player Sound File

- 基本語法
  - Copy an sound file (s1.mid) to res/raw

  - Coding
    ```
    private MediaPlayer mp;
    mp = MediaPlayer.create(this, R.raw.s1);
    mp.start();
    ```
  - Run
- Example:
  (**s1.mid**, **button1**, **button2**)
  ```
  public class MainActivity extends Activity{
      private Button but_start;
      private Button but_stop;
      private MediaPlayer mp;
      protected void onCreate(Bundle savedInstanceState) {
          super.onCreate(savedInstanceState);
          setContentView(R.layout.activity_main);

          but_start = (Button)findViewById(R.id.button1);
          but_start.setOnClickListener(new OnClickListener(){
              public void onClick(View v) {
                  mp = MediaPlayer.create(MainActivity.this, R.raw.s1);
                  mp.start();
              }
          });
          but_stop = (Button)findViewById(R.id.button2);
          but_stop.setOnClickListener(new OnClickListener(){
              public void onClick(View v) {
                  mp.stop();
              }
          });
  ```

```
        }
        ...
    }
```

(2). 範例練習：

■　範例：

請指出下面程式的錯誤？

01 super.onCreate(savedInstanceState);

02 setContentView(R.layout.activity_main);

03 MediaPlayer mp = MediaPlayer.create(MainActivity.this);

04 mp.start();

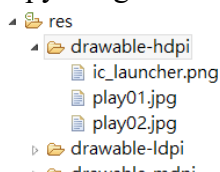Ans: 03: 應為 MediaPlayer mp = MediaPlayer.create(MainActivity.this, **R.raw.s1**);

3.5　ImageButton

(1). Static

■　Usage

➢　Add a new Project

➢　Remove "Hollo World"

➢　Change Layout – Right Click and Select [Change Layout]
[Linear Layout (Vertical)]

➢　Copy image files (play01.jpg, play02.jpg) to res/drawable-hdpi

➢　[Image & Media] – [ImageButton]

➢　Under [RelativeLayout]

➢　Drawable Resources – select "play01"

➢　Content Description: (default – with **warning**)
the warning can be removed as previous description
[define a string] – [select the string ID] ...

➢　[Run]

■　範例：

Ans:

(2). Dynamic:

■　Basic Usage:

➢　As the Static Steps
Background: Empty

➢　[Run]

- Play.xml (define the dynamic images)
  - Right click on [drawable-hdpi]
    select [New] – [Others] – [Android XML File] – [Next]
  - Resource Type = Drawable
    File: "play00.xml"
    Root Element: "selector"
    [Next]
    [Finish]
  - Open the play00.xml
    ```xml
    <?xml version="1.0" encoding="utf-8"?>
    <selector xmlns:android="http://schemas.android.com/apk/res/android" >
        <item android:state_pressed="true" android:drawable="@drawable/play02" />
        <item android:drawable="@drawable/play01" />
    </selector>
    ```
- ImageButton
  - Background: @drawable/play00
- [Run]
- 範例:
  下面 XML 檔主要用於何處?
  ```xml
  <?xml version="1.0" encoding="utf-8"?>
  <selector xmlns:android="http://schemas.android.com/apk/res/android" >
      <item android:state_pressed="true" android:drawable="@drawable/play02" />
      <item android:drawable="@drawable/play01" />
  </selector>
  ```
  Ans: 按下 Button 時會變換圖案

3.6　Toggle Button

(1). Toggle Button

- Usage
  - As the Static Steps – Create Project
    Background: Empty
  - [Form Widgets] – [ToggleButton]
  - Text: (default – with **warning**)
    using @ to remove the warning
  - Define **onClick** event
    ```java
    private OnClickListener tbListener = new OnClickListener() {
        public void onClick(View v) {
            ...
        }
    };
    ```
  - Link the event

ToggleButton **tbSet** = (ToggleButton)findViewById(**R.id.tbIdSet**);
tbSet.setChecked(false);　　// Define "checked" & "unchecked"
tbSet.setText(R.string.tbPtSet);
tbSet.setOnClickListener(tbListener);

➢　Get the status of the ToggleButton (be passed by View)
ToggleButton <u>tb</u>=(ToggleButton) **v**;
if (tb.<u>isChecked</u>()){
　　...
}
➢　[Run]
■　Example
private ToggleButton **tbSet**;
public void onCreate(Bundle savedInstanceState) {
　　super.onCreate(savedInstanceState);
　　setContentView(R.layout.main);

　　tbSet = (ToggleButton)findViewById(**R.id. toggleButton1**);
　　tbSet.<u>setChecked</u>(false);
　　tbSet.setText(R.string.tog_NO);　　//default
　　tbSet.setOnClickListener(tbListener);
}
private OnClickListener tbListener = new OnClickListener() {
　　public void onClick(View **v**) {
　　　　ToggleButton <u>tb</u>=(ToggleButton) **v**;
　　　　if (tb.<u>isChecked</u>()){
　　　　　　tb.setText(R.string.tog_NO);
　　　　　　...
　　　　} else {
　　　　　　tb.setText(R.string.tog_OK);
　　　　　　...
　　　　}
　　}
};
■　Two Image
check.xml
<?xml version="1.0" encoding="utf-8"?>
<selector xmlns:android="http://schemas.android.com/apk/res/android">
　　<item android:drawable="@drawable/img_on"
　　　　android:state_checked="true" />
　　<item android:drawable="@drawable/img_off"
　　　　android:state_checked="false"/>
</selector>

activity_main

<ToggleButton

    ...

    android:button="@drawable/check"　　//check.xml

    ....

■

3.7　Multi-Language Design

(1). string.xml

■ Define string in strings.xml – one language in one file

■ Store strings.xml in different folders
values
   + strings.xml
values-en-rUS
   + strings.xml

…

■ All string.xml are stored in different location
values : Taiwan
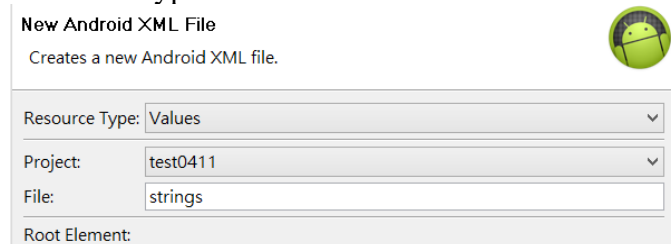values-en : english
values-en-rUS:
values-cn : Main Land
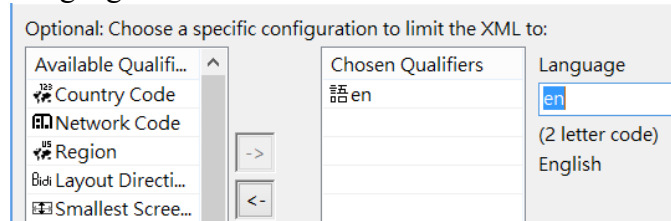Format (cn, en, rUS : region)

(2). Define a new language XML file

■ [File] – [New] – [Android XML files]

■ File Name: **strings**
Resource Type: **Values**

■ Language: en

■ Region: US

- strings.xml

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <string name="app_name">test0411</string>
    <string name="hello_world">Hello world!</string>
    <string name="menu_settings">Settings</string>
    <string name="str1">Name:</string>
    <string name="str2">Dept:</string>
    <string name="str3">Language</string>
</resources>
```
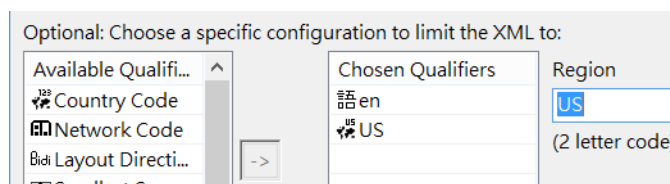
(3). Change Language in <u>Simulator</u>

- [Setting] – [Custom Locale]
- Selecting [zh-TW]

3.8　Exercise

(1). 門禁管理系統(door_control)
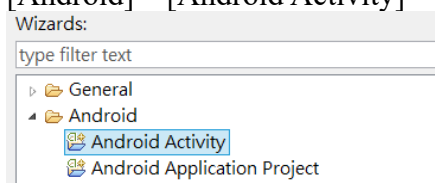
- 程式需求

4. Activity

4.1 Creating Activity

(1). Basic

- Basic Activity Method
  - ➤ onCreate()
  - ➤ onPause()
- Steps
  - ➤ [File] – [New] – [Others]
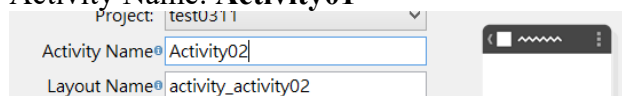 - ➤ [Android] – [Android Activity]

[Next] (without wizards:)
  - ➤ Select "**BlankActivity**"
    [Next]
  - ➤ Activity Name: **Activity01**

[Next]
[Finish]
  - ➤ Make Sure the Activity01 has been in **manifest.xml**
    <activity
    　　android:name="com.example.test0311.**Activity01**"
    　　android:label="@string/title_activity_activity01" >
    </activity>

(2). Creating Activity – without Bundle

- **Steps – MainActivity**
  ...
  private OnClickListener bt_act = new OnClickListener() {
  　　public void onClick(View v) {
  　　　　Intent **intent** = new Intent();
  　　　　intent.setClass(**MainActivity.this**, **Activity01.class**);
  　　　　startActivity(intent);
  　　}
  };
  - ➤ Define **intent**
  - ➤ **setClass**

❯   **startActivity**

■   **Activity01 – finish()**

```
private Button but1;
protected void onCreate(Bundle savedInstanceState) {
    ...
    but1 = (Button)findViewById(R.id.button1);
    but1.setOnClickListener(butListener1);
}
private OnClickListener butListener1 = new OnClickListener() {
    public void onClick(View v) {
        finish();
    }
};
```

(3). Creating Activity – with Bundle

■   Step – MainActivity

```
private OnClickListener bt_act = new OnClickListener() {
    public void onClick(View v) {
        Intent intent=new Intent();
        intent.setClass(MainActivity.this, Activity01.class);
        Bundle bundle = new Bundle();
        bundle.putString("Name", stName);
        bundle.putString("Sex", stSex);
        intent.putExtras(bundle);
        startActivity(intent);
    }
};
```

❯   Define bundle (name, value)
```
bundle.putString("Name", stName);
```

❯   Put the **Bundle** into **intent**
intent.putExtras(bundle);

❯   Start Activity
```
startActivity(intent);
```

■   **Activity01**

```
Bundle bundle = this.getIntent().getExtras();
String stName = bundle.getString("Name");
String stSex = bundle.getString("Sex");
```

❯   Retrieve the Bundle
```
bundle.getString("Name");
```

(4). Creating Activity – with Results

■   MainActivity – <u>Send</u> Bundle
```
final private int LAUNCH_LogSuccAct = 0;   // request code
```

```java
private OnClickListener bt_act = new OnClickListener() {
    public void onClick(View v) {
        Intent intent = new Intent();
        intent.setClass(MainActivity.this, Activity01.class);
        Bundle bundle = new Bundle();
        bundle.putString("Name", stName);
        bundle.putString("Sex", stSex);
        intent.putExtras(bundle);
        startActivityForResult(intent,LAUNCH_LogSuccAct);
    }
};
```

- ➢ Define bundle (name, value)
  bundle.putString("Name", stName);

- ➢ Put the **Bundle** into **intent**
  intent.putExtras(bundle);

- ➢ Start Activity
  startActivityForResult(intent,LAUNCH_LogSuccAct);

- ■ MainActivity – <u>Receive</u> Bundle

```java
protected void onActivityResult(int requestCode, int resultCode, Intent data) {
    if (requestCode != LAUNCH_LogSuccAct)
        return;
    switch (resultCode) {
    case RESULT_OK:
        Bundle bundle = data.getExtras();
        String str1 = bundle.getString("RName");
        Toast.makeText(MainActivity.this,str1,Toast.LENGTH_SHORT).show();
        break;
    case RESULT_CANCELED:
        Toast.makeText(MainActivity.this,"ERR",Toast.LENGTH_SHORT).show();
    }
}
```

- ■ **Activity01**

```java
private OnClickListener butListener1 = new OnClickListener() {
    public void onClick(View v) {
        EditText et1 = (EditText)findViewById(R.id.editText1);
        Bundle bundle = new Bundle();
        bundle.putString("Name", et1.getText().toString());
        Intent intent = new Intent();
        intent.putExtras(bundle);
        setResult(RESULT_OK,intent);
        finish();
    }
};
```

- ➢ **Define bundle & set string**

```
Bundle bundle = new Bundle();
bundle.putString("Name", et1.getText().toString());
```

> **Put into intent**
> intent.putExtras(bundle);

> **Set results**
> setResult(RESULT_OK,intent);

> **finish()**

(5). Example

■ **Example**

下面程式為由 MainActivity.java 呼叫 Activity01.java 的程式，請指出錯誤的地方？

```
...
private OnClickListener bt_act = new OnClickListener() {
    public void onClick(View v) {
        Intent intent = new Intent();
        startActivity(intent);
    }
};
```

答：

缺 intent.setClass(**MainActivity.this**, **Activity01.class**);

■ **Example**

假設有 3 個 Activities，分別為 M1.java, M2.java, M3.java，則由 M1.java 呼叫 M3.java 的程式(?的地方)要如何寫？

```
...
private OnClickListener bt_act = new OnClickListener() {
    public void onClick(View v) {
        Intent intent = new Intent();
        ?
        startActivity(intent);
    }
};
```

答：

缺 intent.setClass(**M1.this**, M3**.class**);

■ **Example**

假設有 2 個 Activities，分別為 M1.java, M2.java，則由 M1.java 呼叫 M2.java 的程式，並將參數 TEST = "15"的字串傳給 M2.java，則程式要如何寫(不用回傳值)？

```
final private int LAUNCH_LogSuccAct = 0;   // request code
private OnClickListener bt_act = new OnClickListener() {
    public void onClick(View v) {
        Intent intent=new Intent();
        intent.setClass(M1.this,M2.class);
        Bundle bundle = new Bundle();
```