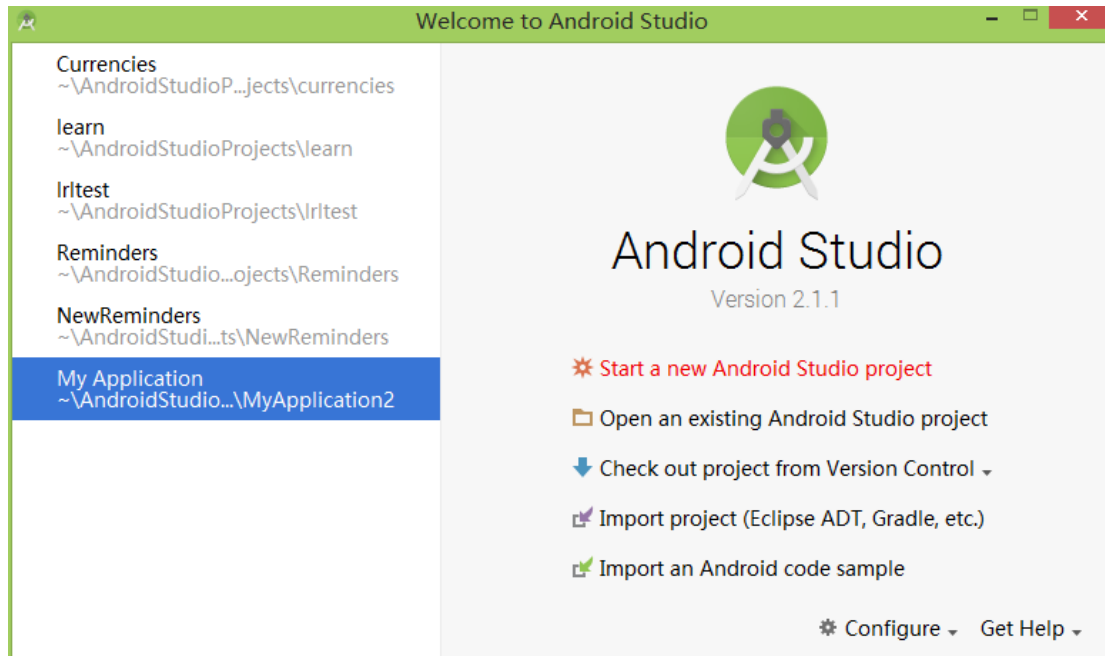
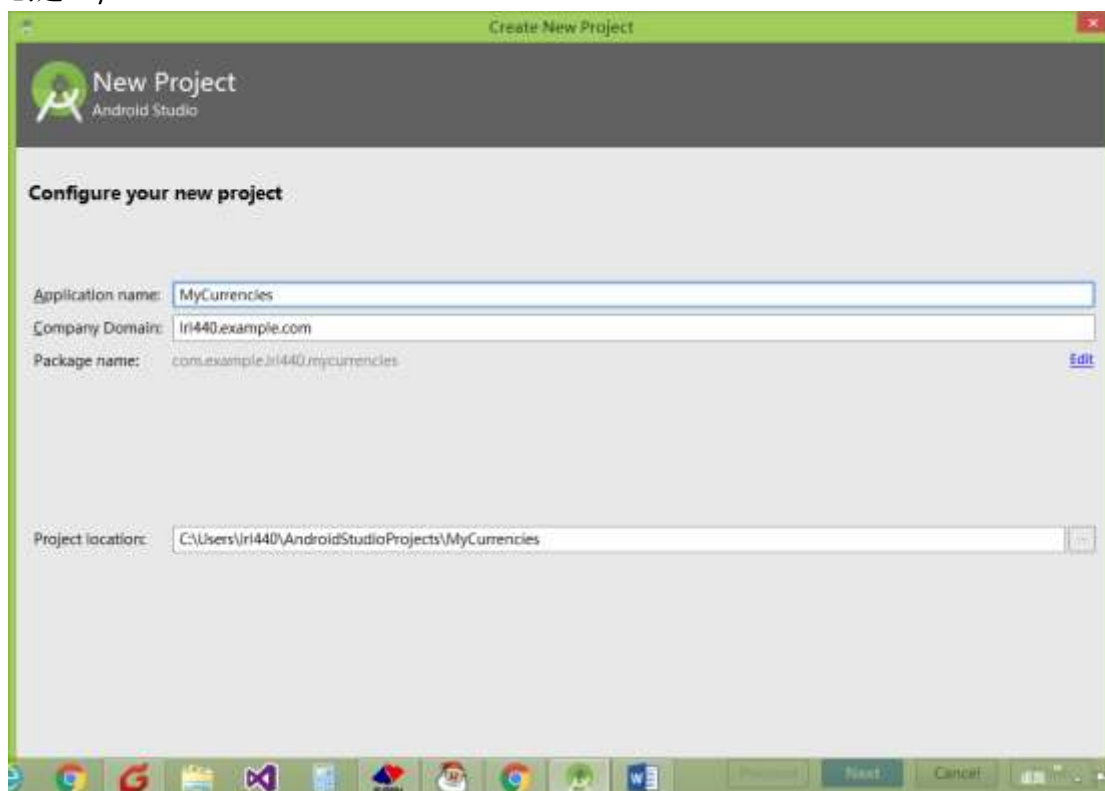


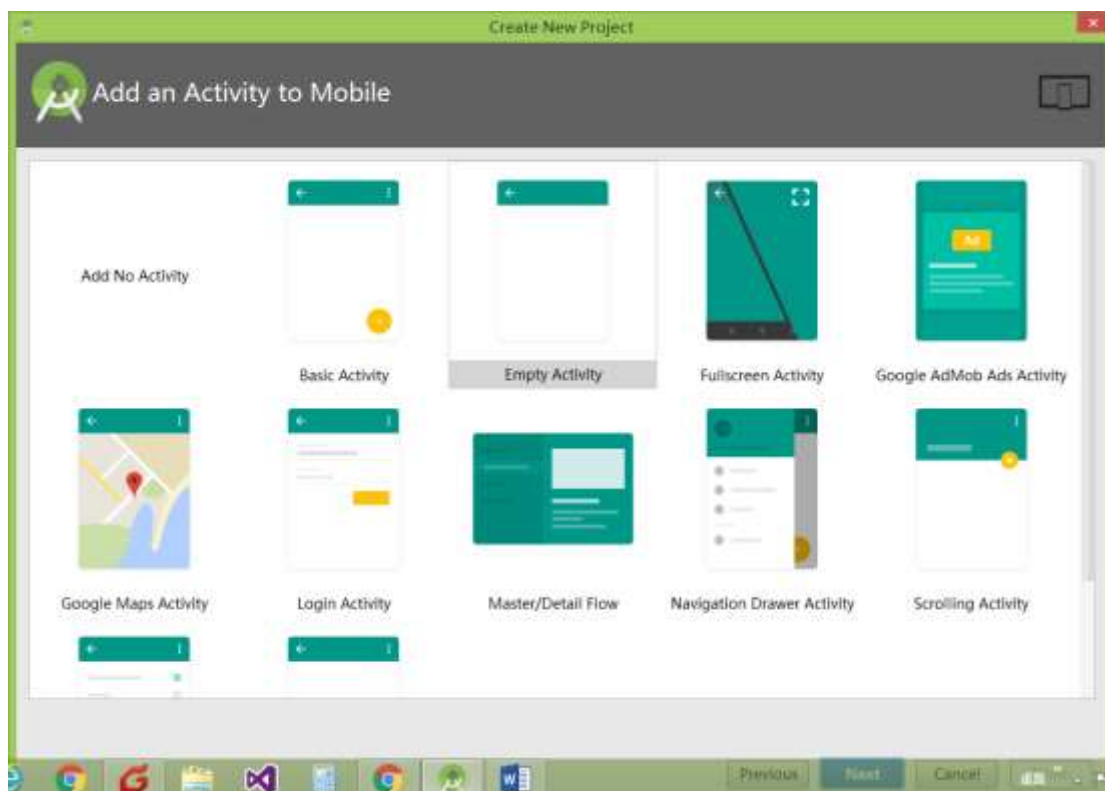
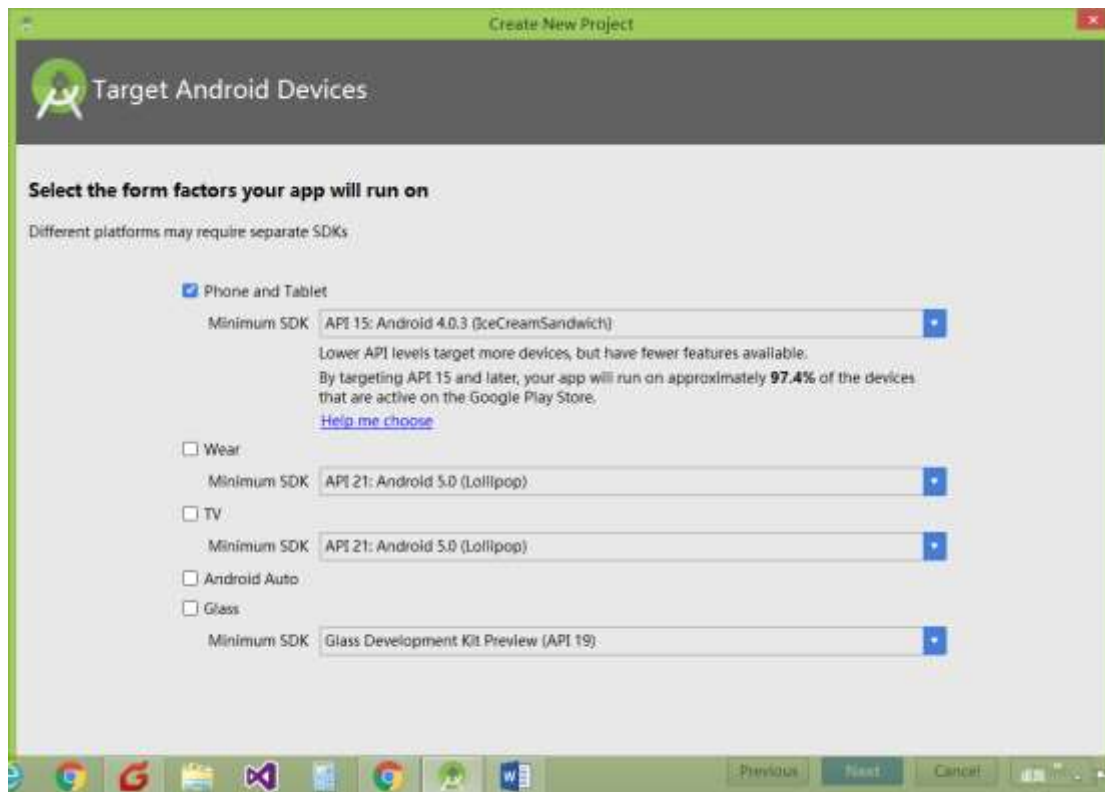
大作业题目：钱币汇率查询 App 开发

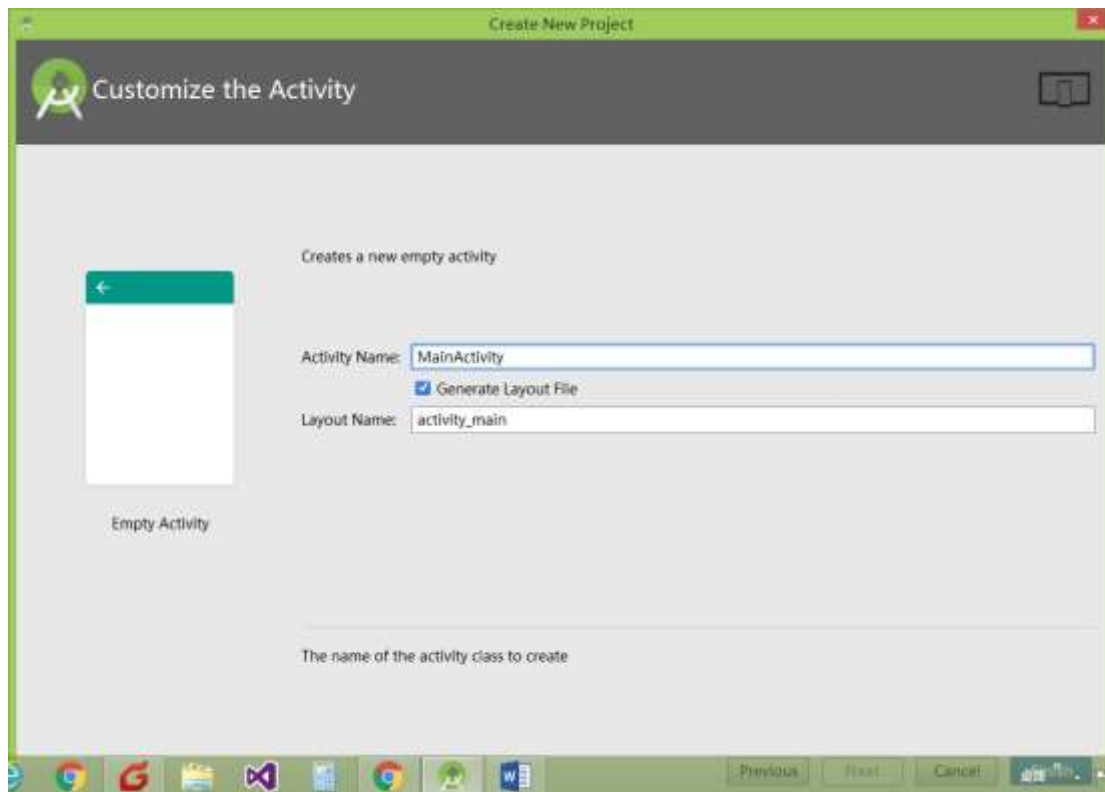
1 第一部分



创建 MyCurrencies







修改 activity_main.xml 文件

设置里面的布局内容

```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:background="#000"
    android:orientation="vertical">
    <LinearLayout
        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_weight="20"
        android:orientation="vertical">
        <TextView
            android:layout_width="fill_parent"
            android:layout_height="0dp"
            android:layout_marginLeft="10dp"
            android:layout_marginRight="10dp"
            android:layout_weight="30"
            android:gravity="bottom"
            android:text="Foreign Currency"
            android:textColor="#ff22e9ff"/>
        <Spinner
            android:id="@+id/spn_for"
```

```

        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_weight="55"
        android:gravity="top"/>
<TextView
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="15"
    android:gravity="bottom"
    android:text="Enter foreign currency amount here:"
    android:textColor="#666"
    android:textSize="12sp"/>
</LinearLayout>
<LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="20"
    android:background="#222">
    <EditText
        android:id="@+id/edt_amount"
        android:layout_width="fill_parent"
        android:layout_height="50dp"
        android:layout_gravity="center_vertical"
        android:layout_marginLeft="5dp"
        android:layout_marginRight="5dp"
        android:background="#111"
        android:digits="0123456789."
        android:gravity="center_vertical"
        android:inputType="numberDecimal"
        android:textColor="#FFF"
        android:textSize="30sp">
        <requestFocus/>
    </EditText>
</LinearLayout>
<Button
    android:id="@+id/btn_calc"
    android:layout_width="fill_parent"
    android:layout_height="0dp"

```

```

        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_weight="10"
        android:text="Calculate"
        android:textColor="#AAA"/>
<LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_weight="20"
    android:orientation="vertical">
    <TextView
        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_weight="30"
        android:gravity="bottom"
        android:text="Home Currency"
        android:textColor="#ff22e9ff"/>
    <Spinner
        android:id="@+id/spn_hom"
        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_weight="55"
        android:gravity="top"/>
    <TextView
        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_marginLeft="10dp"
        android:layout_marginRight="10dp"
        android:layout_weight="15"
        android:gravity="bottom"
        android:text="Calculated result in home currency:"
        android:textColor="#666"
        android:textSize="12sp"/>
</LinearLayout>
<LinearLayout
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="20"

```

```

        android:background="#222">
    <TextView
        android:id="@+id/txt_converted"
        android:layout_width="fill_parent"
        android:layout_height="50dp"
        android:layout_gravity="center_vertical"
        android:layout_marginLeft="5dp"
        android:layout_marginRight="5dp"
        android:background="#333"
        android:gravity="center_vertical"
        android:textSize="30sp"
        android:typeface="normal"/>
    </LinearLayout>
</LinearLayout>

```

如果出现“top level element is not completed”则可以 alt+Enter 再选择 **Uninject language/reference** 选项可以解决错误。

更改资源文件 colors.xml 文件

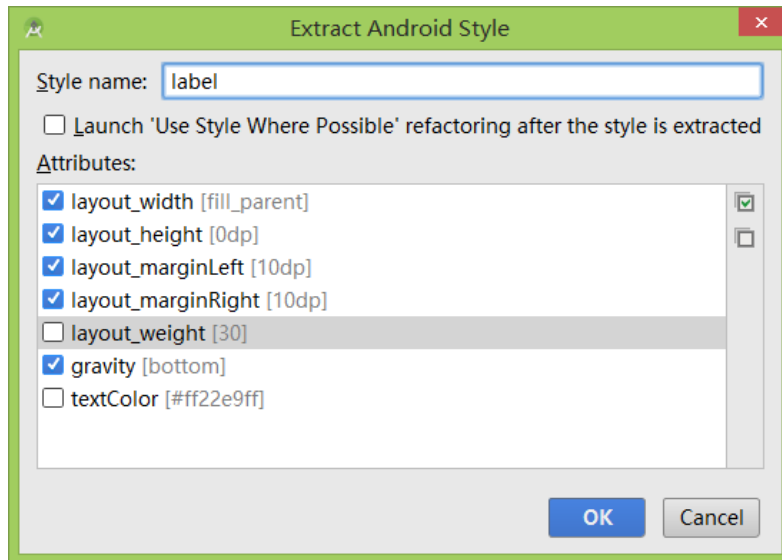
```

<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="white">#FFF</color>
    <color name="black">#000</color>
    <color name="grey_very_dark">#111</color>
    <color name="grey_dark">#222</color>
    <color name="grey_med_dark">#333</color>
    <color name="grey_med">#666</color>
    <color name="grey_light">#AAA</color>
    <color name="turquoise">#ff22e9ff</color>
    <color name="flat_blue">#ff1a51f4</color>
</resources>

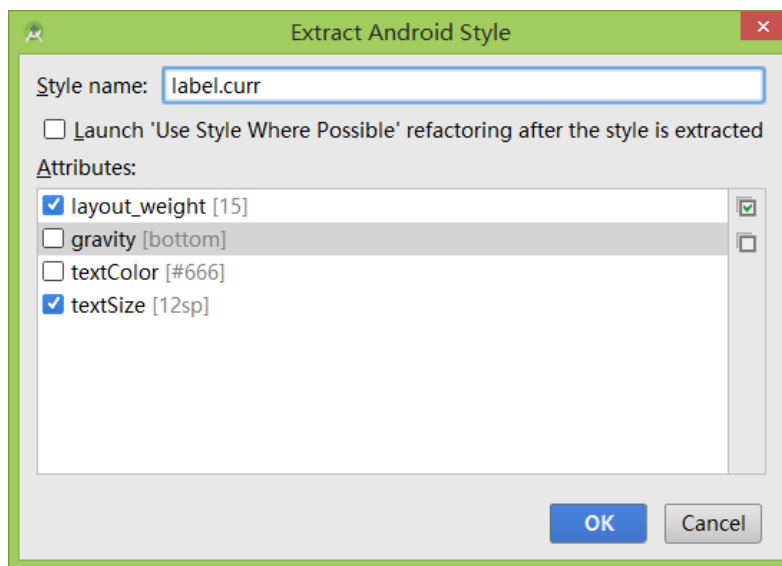
```

使用界面的 style 风格

创建 TextViews 的 style，步骤是光标放到 TextViews 中，菜单上选择 Refactor ➤ Extract ➤ Style



还可以再上面的 `label` 的 `style` 基础上继续细分定义
步骤和上面的类似：



用类似的方法

最终的 `styles.xml` 文件内容如下图所示：

<resources>

```
<!-- Base application theme. -->
```

```
<style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
```

```
    <!-- Customize your theme here. -->
```

```
</style>
```

```

<style name="label">
    <item name="android:layout_width">fill_parent</item>
    <item name="android:layout_height">0dp</item>
    <item name="android:layout_marginLeft">10dp</item>
    <item name="android:layout_marginRight">10dp</item>
    <item name="android:gravity">bottom</item>
</style>

<style name="label.curr">
    <item name="android:layout_weight">30</item>
    <item name="android:textColor">@color/turquoise</item>
</style>

<style name="label.desc">
    <item name="android:layout_weight">15</item>
    <item name="android:textColor">@color/grey_med</item>
    <item name="android:textSize">12sp</item>
</style>

<style name="layout_back">
    <item name="android:layout_width">fill_parent</item>
    <item name="android:layout_height">0dp</item>
    <item name="android:layout_marginLeft">10dp</item>
    <item name="android:layout_marginRight">10dp</item>
    <item name="android:layout_weight">20</item>
    <item name="android:background">@color/grey_dark</item>
</style>

</resources>

```

对应调整后的 activity_main.xml 文件界面文件如下图所示：

```

<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:background="@color/black"
    android:orientation="vertical">

    <LinearLayout
        android:layout_width="fill_parent"
        android:layout_height="0dp"
        android:layout_weight="20"
        android:orientation="vertical">

```



```

<TextView
    android:text="Foreign Currency"
    style="@style/label.curr"/>

<Spinner
    android:id="@+id/spn_for"
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="55"
    android:gravity="top"/>

<TextView
    android:text="Enter foreign currency amount here:"
    style="@style/label.desc"/>
</LinearLayout>

<LinearLayout
    style="@style/layout_back">

    <EditText
        android:id="@+id/edt_amount"
        android:layout_width="fill_parent"
        android:layout_height="50dp"
        android:layout_gravity="center_vertical"
        android:layout_marginLeft="5dp"
        android:layout_marginRight="5dp"
        android:background="@color/grey_very_dark"
        android:digits="0123456789."
        android:gravity="center_vertical"
        android:inputType="numberDecimal"
        android:textColor="@color/white"
        android:textSize="30sp">

        <requestFocus/>
    </EditText>
</LinearLayout>

<Button
    android:id="@+id/btn_calc"
    android:layout_width="fill_parent"
    android:layout_height="0dp"

```

```
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="10"
    android:text="Calculate"
    android:textColor="@color/white"
    android:background="@drawable/button_selector"/>
```

<LinearLayout

```
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_weight="20"
    android:orientation="vertical">
```

<TextView

```
    android:text="Home Currency"
    style="@style/label.curr"/>
```

<Spinner

```
    android:id="@+id/spn_hom"
    android:layout_width="fill_parent"
    android:layout_height="0dp"
    android:layout_marginLeft="10dp"
    android:layout_marginRight="10dp"
    android:layout_weight="55"
    android:gravity="top"/>
```

<TextView

```
    android:text="Calculated result in home currency:"
    style="@style/label.desc"/>
```

</LinearLayout>

<LinearLayout

```
    style="@style/layout_back">
```

<TextView

```
    android:id="@+id/txt_converted"
    android:textColor="@color/white"
    android:layout_width="fill_parent"
    android:layout_height="50dp"
    android:layout_gravity="center_vertical"
    android:layout_marginLeft="5dp"
    android:layout_marginRight="5dp"
    android:background="@color/grey_med_dark"
    android:gravity="center_vertical"
```

```

        android:textSize="30sp"
        android:typeface="normal"/>
    </LinearLayout>
</LinearLayout>

```

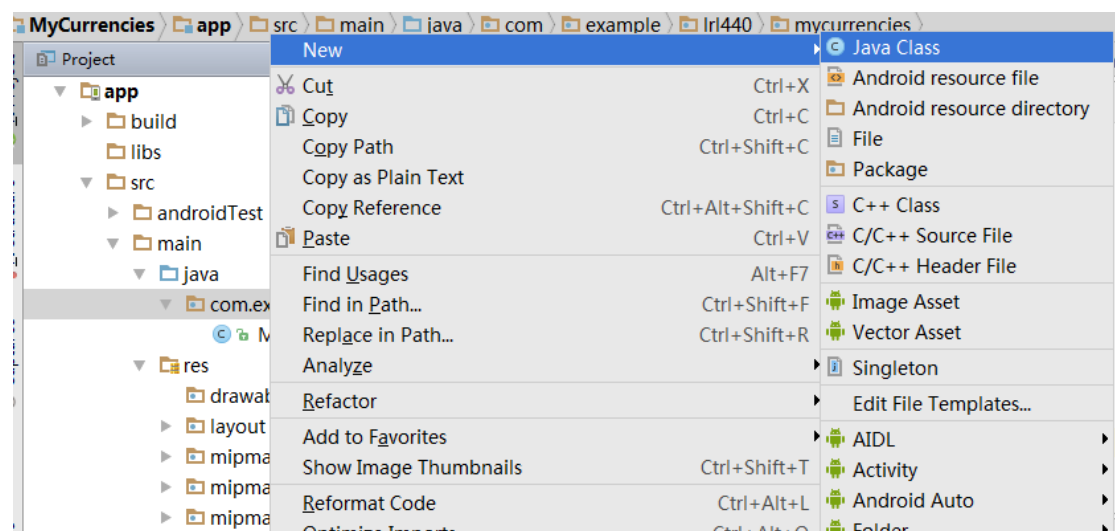
关于 Button 的动态漂亮显示问题

```
android:background="@drawable/button_selector"
```

创建 JSONParser 类

从 openexchangerates.org 网站的 web 服务中获取数据，需要解析 JSON 格式的数据。

右键 `com.example.lrl440.mycurrencies`，New ➤ Java Class，输入 **JSONParser**



具体代码如下：

```

package com.example.lrl440.mycurrencies;

/**
 * Created by lrl440 on 2016/6/7.
 */

import android.util.Log;
import org.apache.http.HttpEntity;
import org.apache.http.HttpResponse;
import org.apache.http.client.ClientProtocolException;
import org.apache.http.client.methods.HttpPost;
import org.apache.http.impl.client.DefaultHttpClient;
import org.json.JSONException;
import org.json.JSONObject;
import java.io.BufferedReader;

```

```

import java.io.IOException;
import java.io.InputStream;
import java.io.InputStreamReader;
import java.io.UnsupportedEncodingException;
public class JSONParser {
    static InputStream sInputStream = null;
    static JSONObject sReturnJsonObject = null;
    static String sRawJsonString = "";
    public JSONParser() {}
    public JSONObject getJSONFromUrl(String url) {
        //attempt to get response from server
        try {
            DefaultHttpClient httpClient = new DefaultHttpClient();
            HttpPost httpPost = new HttpPost(url);
            HttpResponse httpResponse = httpClient.execute(httpPost);
            HttpEntity httpEntity = httpResponse.getEntity();
            sInputStream = httpEntity.getContent();
        } catch (UnsupportedEncodingException e) {
            e.printStackTrace();
        } catch (ClientProtocolException e) {
            e.printStackTrace();
        } catch (IOException e) {
            e.printStackTrace();
        }
        //read stream into string-builder
        try {
            BufferedReader reader = new BufferedReader(new InputStreamReader(
                sInputStream, "iso-8859-1"), 8);
            StringBuilder stringBuilder = new StringBuilder();
            String line = null;
            while ((line = reader.readLine()) != null) {
                stringBuilder.append(line + "\n");
            }
            sInputStream.close();
            sRawJsonString = stringBuilder.toString();
        } catch (Exception e) {
            Log.e("Error reading from Buffer: " + e.toString(),
this.getClass().getSimpleName());
        }
        try {
            sReturnJsonObject = new JSONObject(sRawJsonString);
        } catch (JSONException e) {
            Log.e("Parser", "Error when parsing data " + e.toString());
        }
    }
}

```

```
//return json object
    return sReturnJsonObject;
}
}
```

系统会产生:

Error:(7, 23) 错误: 程序包 org.apache.http 不存在

下载 org.apache.http.legacy.jar 这个 jar 包。放置到程序 app->libs 目录下

打开 build.gradle 文件, 在 android 节点下面添加: org.apache.http.legacy

在 build.gradle 中增加

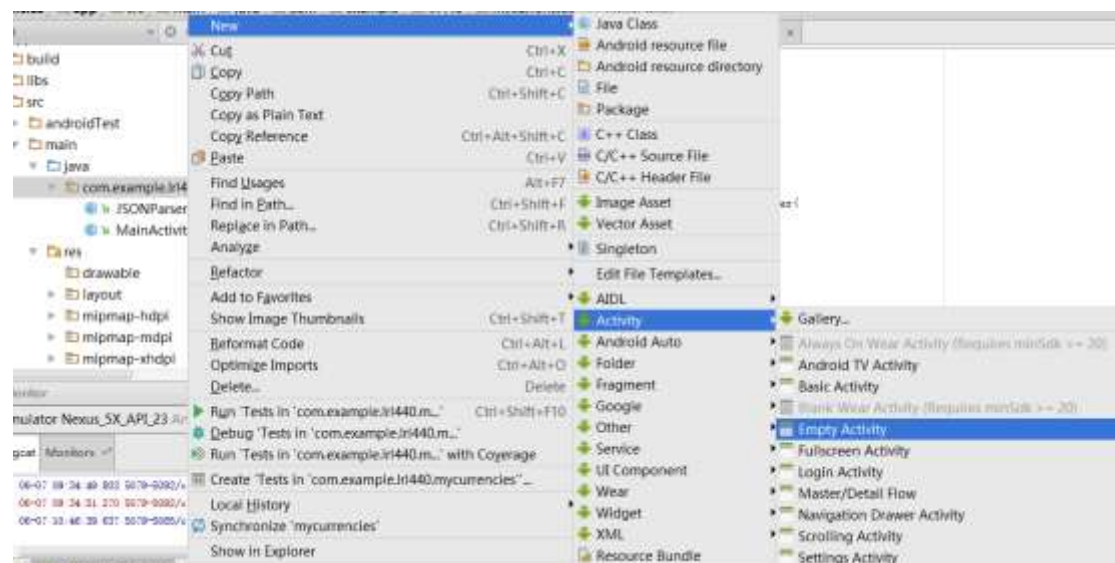
```
android { useLibrary 'org.apache.http.legacy' }
```

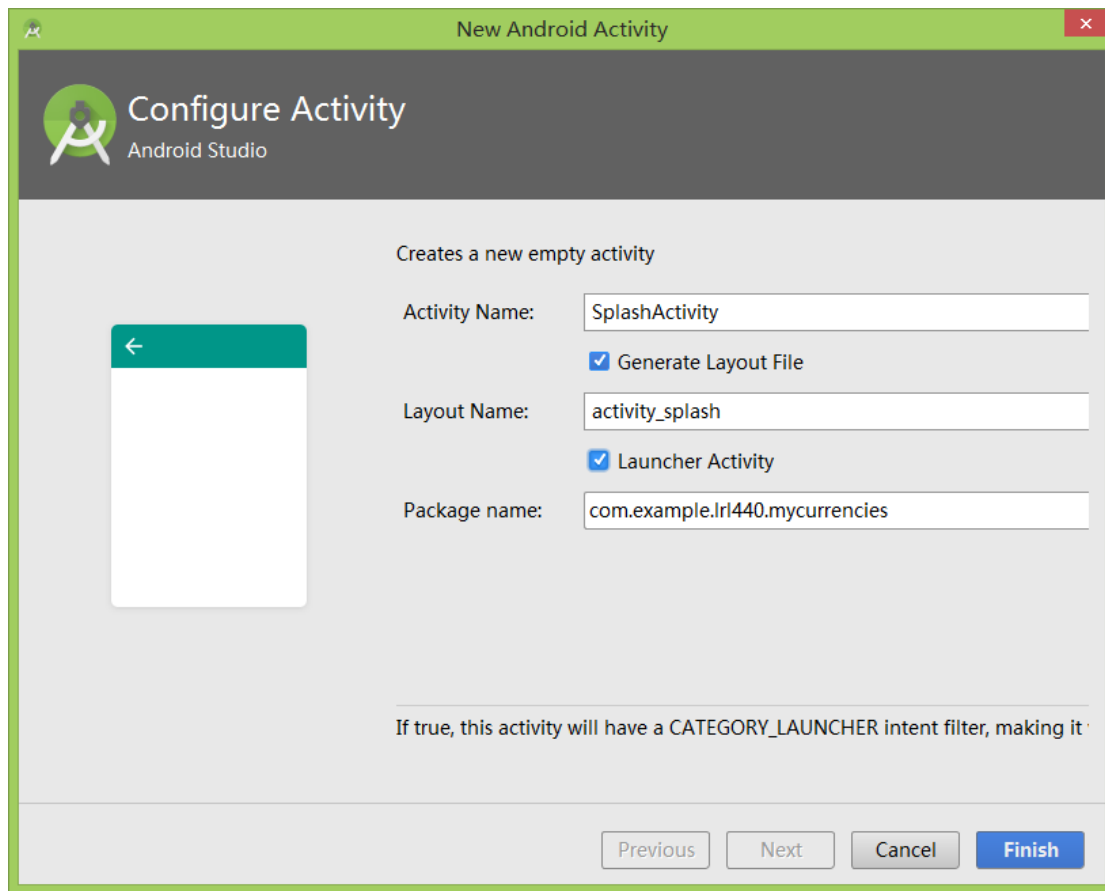


创建 Splash Activity

创建一个 SplashActivity

New > Activity > Empty Activity





修改代码如下：

需要增加的包可以通过光标在 **FEATURE_NO_TITLE** 是按 Alt+Enter 键实现自动加入。

把 AppCompatActivity 修改为 Activity

```
package com.example.lrl440.mycurrencies;
```

```
import android.os.Bundle;
```

```
import android.app.Activity;
```

```
import android.view.Window;
```

```
public class SplashActivity extends Activity{
```

```
    @Override
```

```
    protected void onCreate(Bundle savedInstanceState) {
```

```
        super.onCreate(savedInstanceState);
```

```
        this.requestWindowFeature(Window.FEATURE_NO_TITLE); //新增加的，表示不
```

要标题

```

        setContentView(R.layout.activity_splash);
    }
}

```

修改 MyCurrencies\app\src\main\AndroidManifest.xml 文件，可以用快捷方式 Press Ctrl+Shift+N 输入 And 就可以查看到对应的文件，双击打开并修改为如下内容：

```

<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.lrl440.mycurrencies">

    <uses-permission android:name="android.permission.INTERNET"></uses-permission>

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:supportRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            </activity>
        <activity android:name=".SplashActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

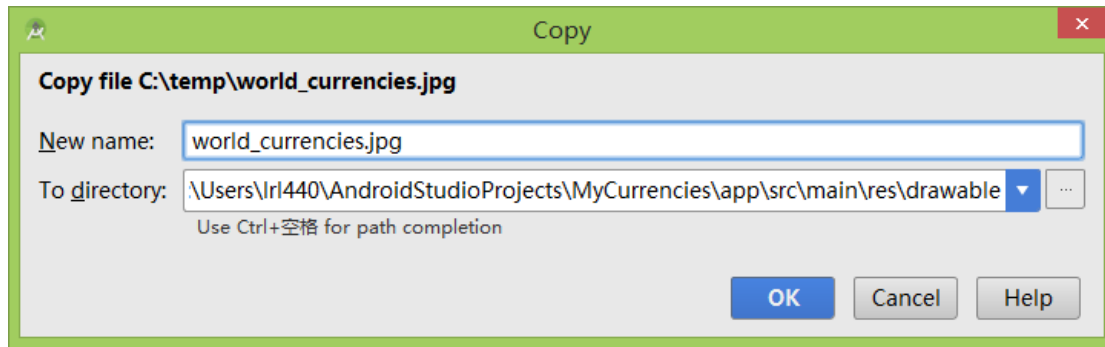
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>

```

下载一个钱币的图片

复制到对应的路径下面 MyCurrencies\app\src\main\res\drawable
可以直接在 drawable 位置粘贴就可以了。



修改 MyCurrencies\app\src\main\res\layout\activity_splash.xml
文件中的背景图片内容

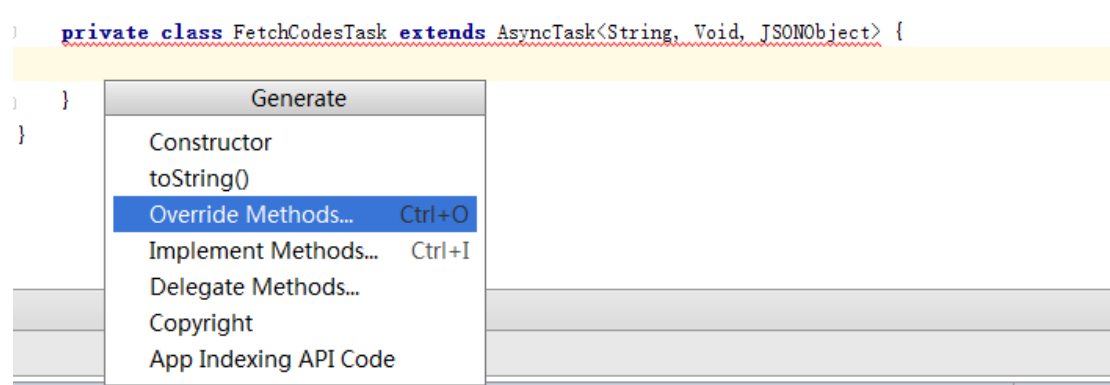
```
<?xml version="1.0" encoding="utf-8"?>
<LinearLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="fill_parent"
    android:layout_height="fill_parent"
    android:background="@drawable/world_currencies"
    android:orientation="vertical">
</LinearLayout>
```

通过 JSON 格式获取货币代码

通过创建私有内部类实现数据的提取。

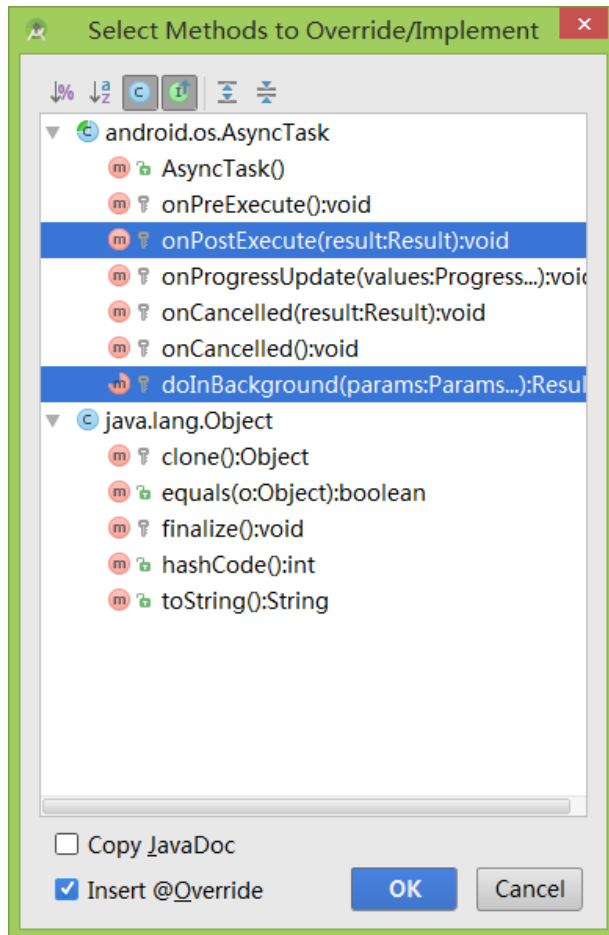
```
private class FetchCodesTask extends AsyncTask<String, Void, JSONObject> {
}
```

在该方法中输入 Alt+Insert ， 显示



选择 Override Methods...

再在图中选择：



具体代码如下：

```
package com.example.lrl440.mycurrencies;
```

```
import android.os.AsyncTask;
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;
import android.view.Window;
import android.widget.Toast;
```

```
import org.json.JSONException;
import org.json.JSONObject;
```

```
import java.util.ArrayList;
import java.util.Iterator;
```

```
public class SplashActivity extends AppCompatActivity {
```

```
    //url to currency codes used in this application
```

```

    public static final String URL_CODES =
        "http://openexchangerates.org/api/currencies.json";
        //ArrayList of currencies that will be fetched and passed into MainActivity
    private ArrayList<String> mCurrencies;
    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        this.requestWindowFeature(Window.FEATURE_NO_TITLE);
        setContentView(R.layout.activity_splash);

```

//新增的代码

```

new FetchCodesTask().execute(URL_CODES);

```

```

}

private class FetchCodesTask extends AsyncTask<String, Void, JSONObject> {

    @Override
    protected JSONObject doInBackground(String... params) {
        return new JSONParser().getJSONFromUrl(params[0]);
    }

    @Override
    protected void onPostExecute(JSONObject jsonObject) {
        try {
            if (jsonObject == null) {
                throw new JSONException("no data available.");
            }
            Iterator iterator = jsonObject.keys();
            String key = "";
            mCurrencies = new ArrayList<String>();
            while (iterator.hasNext()) {
                key = (String) iterator.next();
                mCurrencies.add(key + " | " + jsonObject.getString(key));
            }
            finish();
        } catch (JSONException e) {
            Toast.makeText(
                SplashActivity.this,
                "There's been a JSON exception: " + e.getMessage(),
                Toast.LENGTH_LONG
            ).show();

```

```

        e.printStackTrace();
        finish();
    }
}
}
}
}

```

加载 MainActivity

安卓平台架构非常开放和模块化，以方便集成第三方应用。不能通过对象引用的方式传递数据，即使在同一应用的不同 Activity 中。通过传值的方式实现。

增加如下代码：

```

        mCurrencies.add(key + " | " + jsonObject.getString(key));
    }

    Intent mainIntent = new Intent(SplashActivity.this, MainActivity.class);
    mainIntent.putExtra("key_arraylist", mCurrencies);
    startActivity(mainIntent);

    finish();
}

```

把光标放在 key_arraylist，再 Ctrl+Alt+C

```

    Intent mainIntent = new Intent(SplashActivity.this, MainActivity.class);
    mainIntent.putExtra("key_arraylist", mCurrencies);
    startActivity(mainIntent);

    finish();
} catch (JSONException e) {

```

Choose class to introduce constant

- FetchCodesTask in SplashActivity (com.example.lrl440.mycurrencies) app
- SplashActivity (com.example.lrl440.mycurrencies) app**

```

    public static final String KEY_ARRAYLIST = "key_arraylist";
    ☐ Move to another class

    Intent mainIntent = new Intent(SplashActivity.this, MainActivity.class);
    mainIntent.putExtra(KEY_ARRAYLIST, mCurrencies);
    startActivity(mainIntent);

    finish();
} catch (JSONException e) {
    Toast.makeText(
        SplashActivity.this,

```

KEY_ARRAYLIST

ARRAYLIST

NAME

STRING

Press Ctrl+Alt+C to show dialog with more options

最终，系统定义了

```
public static final String KEY_ARRAYLIST = "key_arraylist";
```

1 第二部分

1.1 定义 MainActivity 成员

分别打开 MainActivity.java 和 activity_main.xml 文件方便同时查看两个文件，选中 activity_main.xml 标签点击右键选择 Move Right

通过 findViewById()方法返回视图对象

```
public class MainActivity extends AppCompatActivity {  
    //define members that correspond to Views in our layout  
    private Button mCalcButton;  
    private TextView mConvertedTextView;  
    private EditText mAmountEditText;  
    private Spinner mForSpinner, mHomSpinner;
```

```
    @Override  
    protected void onCreate(Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        //assign references to our Views;  
        mConvertedTextView = (TextView) findViewById(R.id.txt_converted);  
        mAmountEditText = (EditText) findViewById(R.id.edt_amount);  
        mCalcButton = (Button) findViewById(R.id.btn_calc);  
        mForSpinner = (Spinner) findViewById(R.id.spn_for);  
        mHomSpinner = (Spinner) findViewById(R.id.spn_hom);
```

1.2 从 Bundle 中提取货币代码

```
语句        //unpack ArrayList from the bundle and convert to array  
        ArrayList<String> arrayList = ((ArrayList<String>)  
            getIntent().getSerializableExtra(SplashActivity.KEY_ARRAYLIST));
```

定义成员

```
private Button mCalcButton;
private TextView mConvertedTextView;
private EditText mAmountEditText;
private Spinner mForSpinner, mFromSpinner;
private String[] mCurrencies;
```

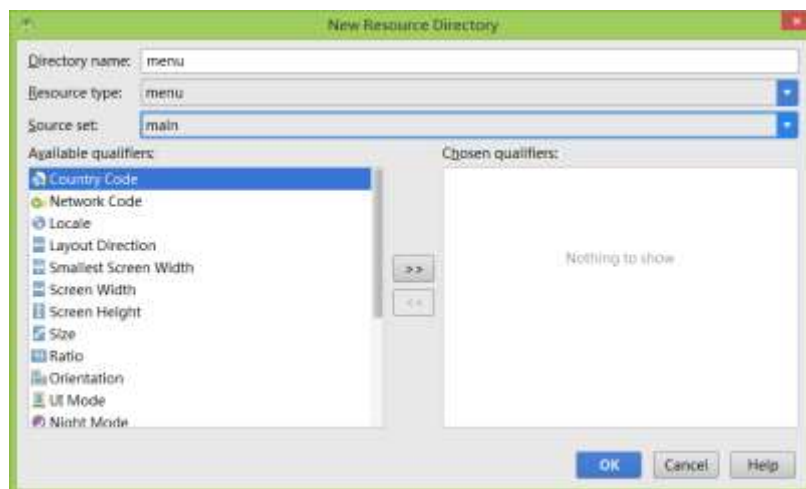
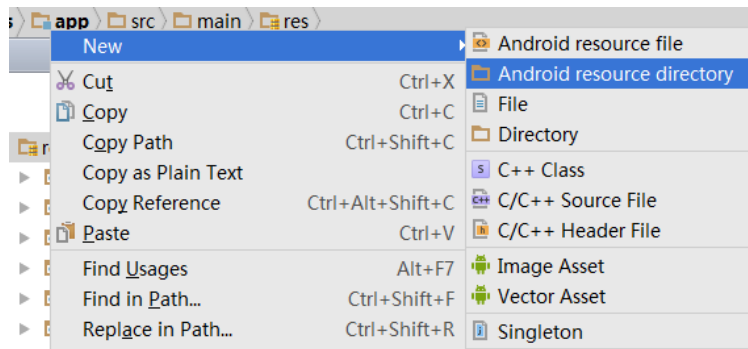
获取 Bundle 传递的数据

```
setContentView(R.layout.activity_main);
```

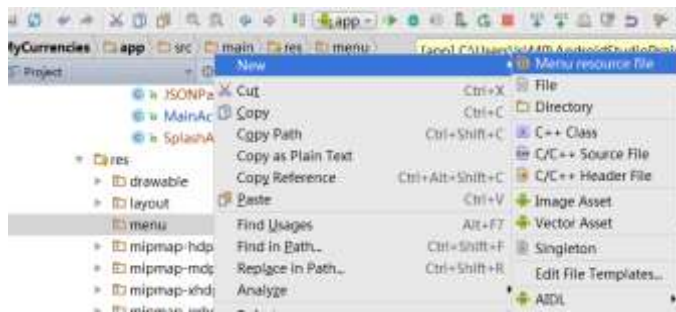
```
//unpack ArrayList from the bundle and convert to array
ArrayList<String> arrayList = ((ArrayList<String>)
    getIntent().getSerializableExtra(SplashActivity.KEY_ARRAYLIST));
Collections.sort(arrayList);
mCurrencies = arrayList.toArray(new String[arrayList.size()]);
```

创建菜单项

创建一个资源路径 menu



创建一个资源文件 menu_main.xml



编辑菜单内容

```
<?xml version="1.0" encoding="utf-8"?>
<menu 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"
      tools:context=".MainActivity">
    <item
        android:id="@+id/mnu_codes"
        android:orderInCategory="100"
        android:title="search active codes"
        app:showAsAction="never"/>
    <item
        android:id="@+id/mnu_invert"
        android:orderInCategory="200"
        android:title="invert codes"
        app:showAsAction="never"/>

    <item
        android:id="@+id/mnu_exit"
        android:orderInCategory="300"
        android:title="exit"
        app:showAsAction="never"/>

</menu>
```

app:showAsAction 属性决定该菜单的位置，设置为 never 表示不显示在 action bar 上而是出现在 overflow 菜单上（就是 action bar 右边的三个小圆点）

android:orderInCategory="200" 用 100 的倍数，方便菜单的新增插入，不需要重新修改其他菜单的序号。

菜单的 id 用户关联 java 代码的具体功能

@Override

```
public boolean onOptionsItemSelected(MenuItem item) {
```

```

int id = item.getItemId();
switch (id) {
    case R.id.mnu_invert:
        //TODO define behavior here
        break;
    case R.id.mnu_codes:
        //TODO define behavior here
        break;
    case R.id.mnu_exit:
        finish();
        break;
}
return true;
// return super.onPrepareOptionsMenu(item);
}

```

菜单功能的具体实现

在这部分内容里面，我们需要用到新的权限。使用安卓手机的用户都知道在安装软件的时候会告诉你系统需要使用哪些权限。这个权限通过 AndroidManifest.xml 文件中的代码来实现。

```

<uses-permission android:name="android.permission.INTERNET"></uses-permission>
<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE"></uses-permission>

```

这个代码用于判断网络状态 `<uses-permission android:name="android.permission.ACCESS_NETWORK_STATE"></uses-permission>`

打开 MainActivity.java，定义如下三个方法。

isOnline()方法检查用户是否连接网络，这也是为什么要增加网络访问状态这个权限的原因。

```

public boolean isOnline() {
    ConnectivityManager cm =
        (ConnectivityManager)
            getSystemService(Context.CONNECTIVITY_SERVICE);
    NetworkInfo networkInfo = cm.getActiveNetworkInfo();
    if (networkInfo != null && networkInfo.isConnectedOrConnecting()) {
        return true;
    }
    return false;
}

private void launchBrowser(String strUri) {
    if (isOnline()) {
        Uri uri = Uri.parse(strUri);
        //call an implicit intent
        Intent intent = new Intent(Intent.ACTION_VIEW, uri);
    }
}

```

```

        startActivity(intent);
    }
}

private void invertCurrencies() {
    int nFor = mForSpinner.getSelectedItemId();
    int nHom = mHomSpinner.getSelectedItemId();
    mForSpinner.setSelection(nHom);
    mHomSpinner.setSelection(nFor);
    mConvertedTextView.setText("");
}

```

在菜单的执行方法 `onOptionsItemSelected()` 上调用这两个方法。

```

case R.id.mnu_invert:
    //TODO define behavior here
    invertCurrencies();
    break;
case R.id.mnu_codes:
    //TODO define behavior here
    launchBrowser(SplashActivity.URL_CODES);
    break;

```

创建 spinner_closed Layout

选择 res/layout 路径，并右键 New ➤ Layout 输入 spinner_closed 文件名。

里面的内容代替为如下：

```

<TextView xmlns:android="http://schemas.android.com/apk/res/android"
    android:id="@android:id/text1"
    android:background="@color/grey_very_dark"
    android:textColor="@color/grey_light"
    android:singleLine="true"
    android:textSize="18sp"
    android:layout_width="match_parent"
    android:layout_height="fill_parent"
    android:gravity="center_vertical"
    android:ellipsize="marquee"
/>

```

给 Spinners 绑定 mCurrencies 数据

因为有两个 Spinners 需要绑定，需要编写一个 ArrayAdapter 代码如下图所示：


```

mHomSpinner = (Spinner) findViewById(R.id.spn_hom);

//controller: mediates model and view
ArrayAdapter<String> arrayAdapter = new ArrayAdapter<String>(

    //context
    this,
    //view: layout you see when the spinner is closed
    R.layout.spinner_closed,
    //model: the array of Strings
    mCurrencies
);

//view: layout you see when the spinner is open
arrayAdapter.setDropDownViewResource(
    android.R.layout.simple_spinner_dropdown_item);
//assign adapters to spinners
mHomSpinner.setAdapter(arrayAdapter);
mForSpinner.setAdapter(arrayAdapter);

```

委托 Spinner 的动作

Java 的事件驱动模型非常方便，我们可以通过委托来处理对象的恰当监听接口。如果对特定的视图，可以通过匿名内部类来实现。对于同一类型的多个视图，通过委托的方式来实现比较简单。

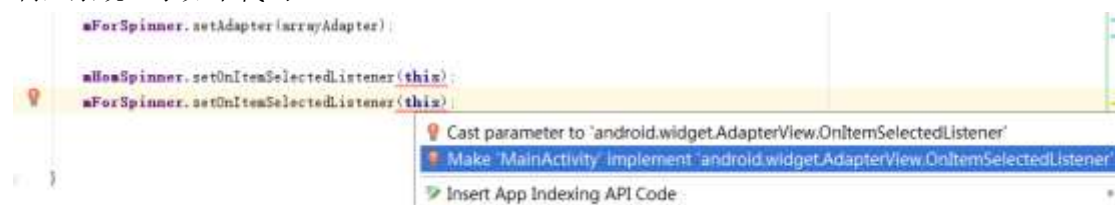
```

mHomSpinner.setAdapter(arrayAdapter);
mForSpinner.setAdapter(arrayAdapter);

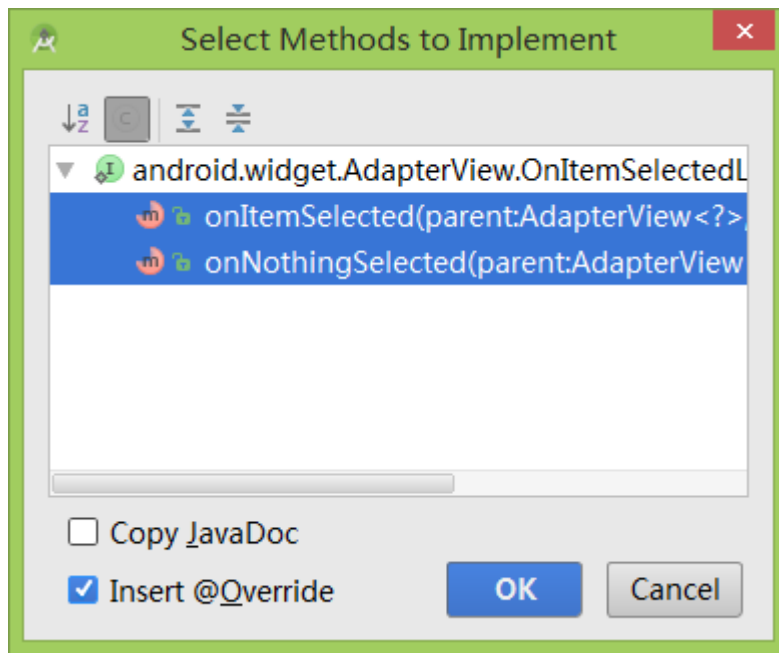
mHomSpinner.setOnItemSelectedListener(this);
mForSpinner.setOnItemSelectedListener(this);

```

上面的代码还是有一些错误，把光标放在 **this** 这个位置，按 **Alt+Enter** 触发智能代码完成机制，系统显示如下代码：



选择第二个选项



在 `onItemSelected` 中增加如下代码

```
@Override
public void onItemSelected(AdapterView<?> parent, View view, int position,
long id) {
    switch (parent.getId()) {

        case R.id. spn_for:
            PrefsMgr. setString(this, FOR,

extractCodeFromCurrency((String)mForSpinner.getSelectedItem()));
            break;

        case R.id. spn_hom:
            PrefsMgr. setString(this, HOM,

extractCodeFromCurrency((String)mHomSpinner.getSelectedItem()));
            break;

        default:
            break;
    }

    mConvertedTextView.setText("");
}
```

```

@Override
public void onNothingSelected(AdapterView<?> parent) {

}

```

创建 Preferences 管理

对于记录集一般采用 SQLite 来实现，而个性化的配置管理一般用 shared preferences 来保存用户配置信息。

我们需要记录用户最近一次访问的币种。通过创建 PrefsMgr 工具类，代码如下图所示。

```

import android.content.Context;
import android.content.SharedPreferences;
import android.preference.PreferenceManager;

public class PrefsMgr {

    private static SharedPreferences sSharedPreferences;

    public static void setString(Context context, String locale, String
code ) {
        sSharedPreferences =
            PreferenceManager.getDefaultSharedPreferences(context);
        SharedPreferences.Editor editor = sSharedPreferences.edit();
        editor.putString(locale, code);
        editor.commit();
    }

    public static String getString(Context context, String locale){
        sSharedPreferences =
            PreferenceManager.getDefaultSharedPreferences(context);
        return sSharedPreferences.getString(locale, null);
    }
}

```

查询给定代码的位置

设置 spinner 特定的值，需要查找对应的索引位置。

在 MainActivity.java 中增加一个函数

```

private int findPositionGivenCode(String code, String[] currencies) {

    for (int i = 0; i < currencies.length; i++) {
        if ((currencies[i]).substring(0,3).equalsIgnoreCase(code)) {
            return i;
        }
    }
}

```

```

    }
}
//default
return 0;
}

```

从 Currency 中提取代码

```

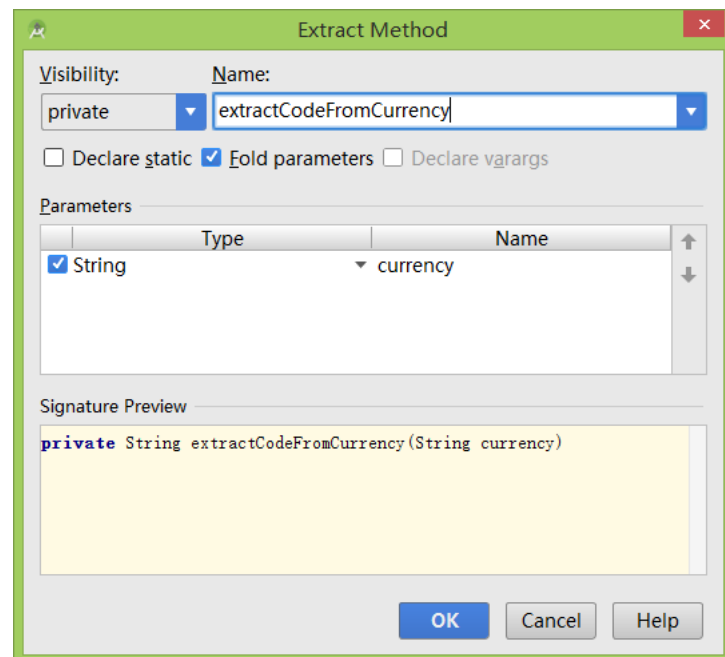
private int findPositionGivenCode(String code, String[] currencies) {

    for (int i = 0; i < currencies.length; i++) {
        if ((currencies[i]).substring(0,3).equalsIgnoreCase(code)) {
            return i;
        }
    }

    //default
    return 0;
}

```

选中一段通用的代码，按 **Ctrl+Alt+M**，能够方便的把这段代码生成为对应的方法。



系统自动生成了如下代码，并且调用方式也进行了相应的修改。

```

private int findPositionGivenCode(String code, String[] currencies) {

    for (int i = 0; i < currencies.length; i++) {
        if (extractCodeFromCurrency(currencies[i]).equalsIgnoreCase(code)) {
            return i;
        }
    }

    //default
    return 0;
}

private String extractCodeFromCurrency(String currency) {
    return (currency).substring(0,3);
}

```

个性化数据保存 Shared Preferences 实现

SharedPreferences 是 Android 平台上一个轻量级的存储类,用来保存应用的一些常用配置。SharedPreferences 数据以哈希表的形式保存, 打开 MainActivity.java, 定义两个字符串常量。

```
private String[] mCurrencies;
```

```

public static final String FOR = "FOR_CURRENCY";
public static final String HOM = "HOM_CURRENCY";

```

增加 if/else 语句, 用于判断是否存在个性化的本币和外币数据

```
mForSpinner.setOnItemSelectedListener(this);
```

```

//set to shared-preferences or pull from shared-preferences on restart
if (savedInstanceState == null
    && (PrefsMgr.getString(this, FOR) == null &&
        PrefsMgr.getString(this, HOM) == null)) {

    mForSpinner.setSelection(findPositionGivenCode("USD", mCurrencies));
    mHomSpinner.setSelection(findPositionGivenCode("CNY", mCurrencies));

    PrefsMgr.setString(this, FOR, "USD");
    PrefsMgr.setString(this, HOM, "CNY");
} else {
    mForSpinner.setSelection(findPositionGivenCode(PrefsMgr.getString(this,
        FOR), mCurrencies));
    mHomSpinner.setSelection(findPositionGivenCode(PrefsMgr.getString(this,
        HOM), mCurrencies));
}

```

查看原先定义的 onItemSelected()方法, 修改该方法, 实现当选择项发生变化的时候, 能够把修改后的内容加入到 SharedPreferences。

```
public void onItemSelected(AdapterView<?> parent, View view, int position, long id) {
```

```

switch (parent.getId()) {

    case R.id.spn_for:
        PrefsMgr.setString(this, FOR,
            extractCodeFromCurrency((String)mForSpinner.getSelectedItem()));
        break;

    case R.id.spn_hom:
        PrefsMgr.setString(this, HOM,
            extractCodeFromCurrency((String)mHomSpinner.getSelectedItem()));
        break;

    default:
        break;
}

mConvertedTextView.setText("");

}

```

最后，在交换币种的时候也能够保存该信息。

```

private void invertCurrencies() {
    int nFor = mForSpinner.getSelectedItemPosition();
    int nHom = mHomSpinner.getSelectedItemPosition();
    mForSpinner.setSelection(nHom);
    mHomSpinner.setSelection(nFor);
    mConvertedTextView.setText("");

    PrefsMgr.setString(this, FOR, extractCodeFromCurrency((String)
        mForSpinner.getSelectedItem()));
    PrefsMgr.setString(this, HOM, extractCodeFromCurrency((String)
        mHomSpinner.getSelectedItem()));
}

```

按钮点击事件的实现

因为在本应用中只有一个按钮，所以可以通过匿名内部类的形式实现事件的委托，这比用前面显式的方法要更加清晰。

在 `onCreate()` 方法的最后部分，输入 `mCalcButton.setOnClickListener`，再在括号里面输入 `new On`，输入的时候要区分大小写，再用箭头选择 `OnClickListener` 然后回车。

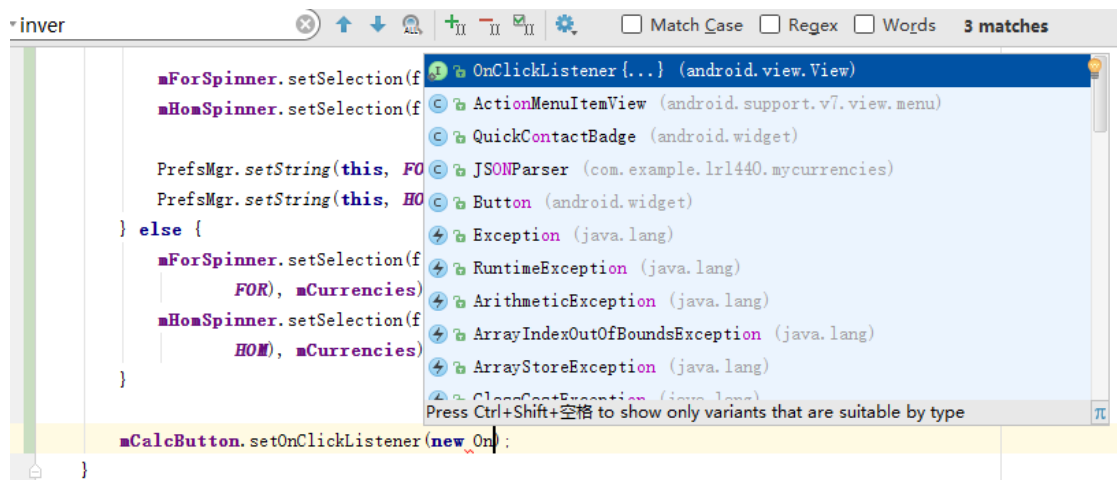


图 创建一个匿名内部类

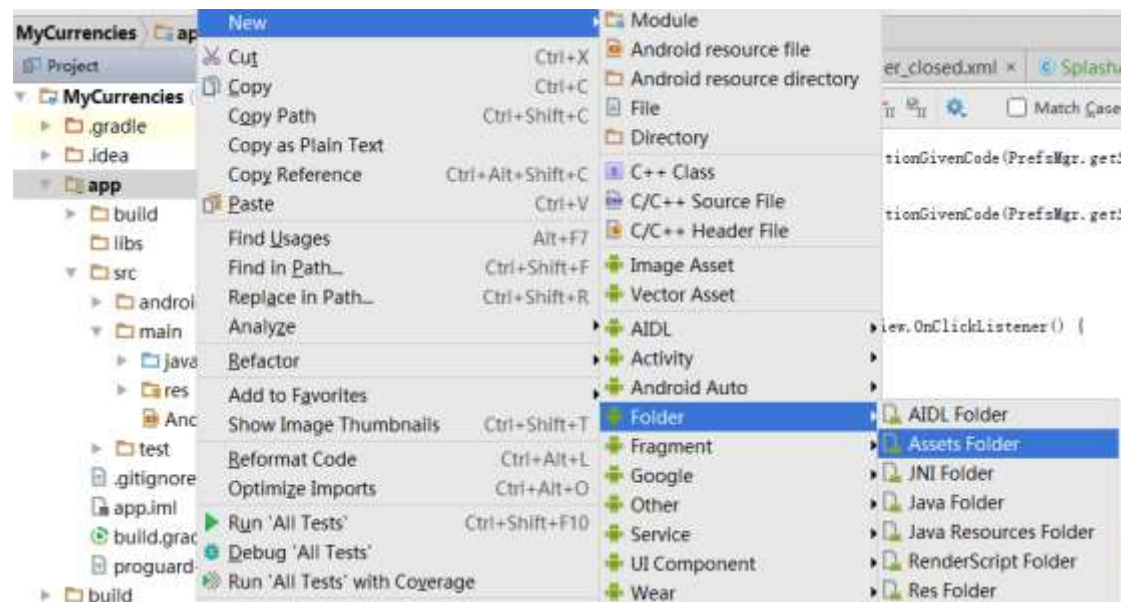
系统能够生成如下代码：

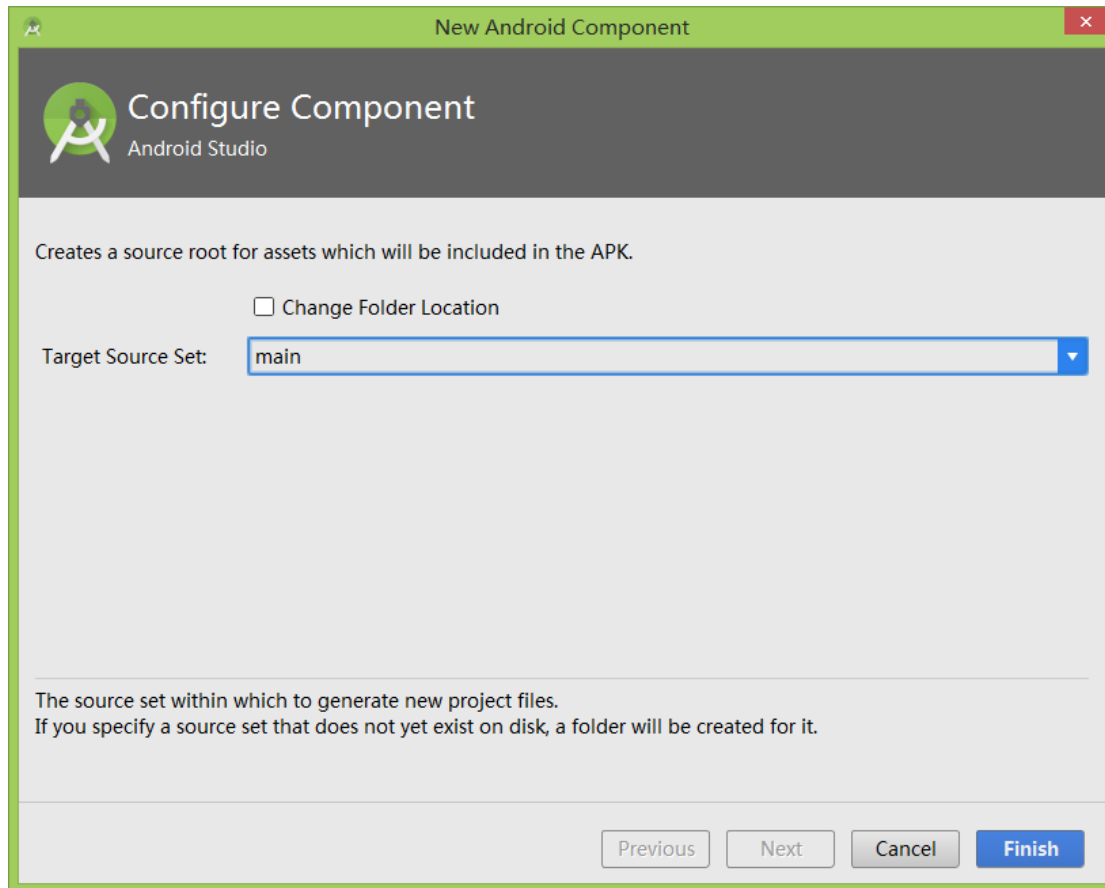
```
mCalcButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

    }
});
```

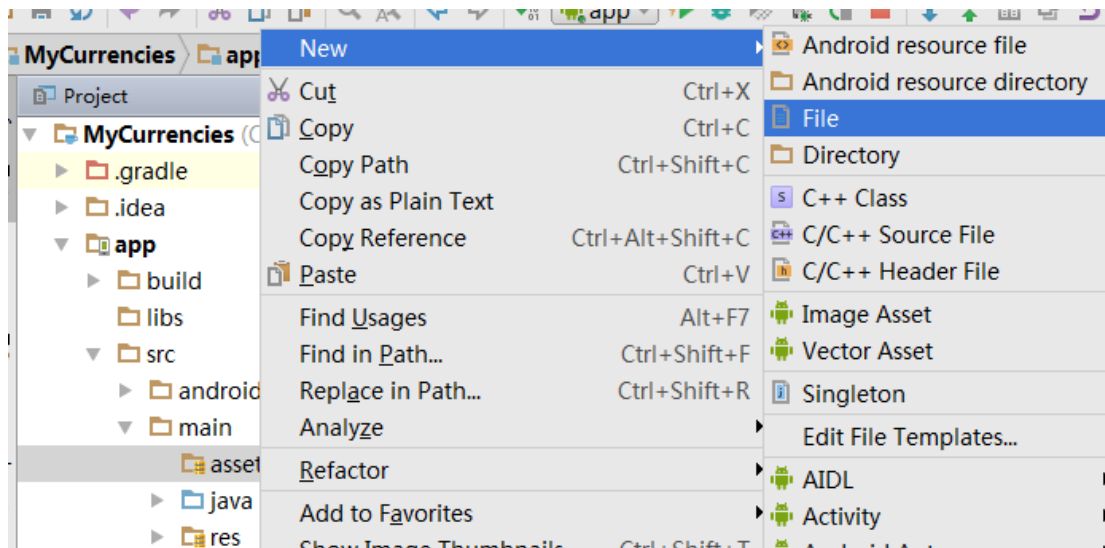
保存开发者密钥

在项目工具窗口选择New > Folder > Assets Folder.





右击刚才创建的assets目录，New > File，输入keys.properties



在该文件中输入如下内容

`open_key=9a894f5f4f5742e2897d20bdcac7706a`


```
MainActivity.java × keys.properties × PrefsMgr.java × spinner_closed.xml ×
#The following key is NOT a valid key.
#Please sign-up for your own key here: https://openexchangerates.org/signup/free
#then replace the invalid placeholder key below with your own valid key
open_key=9a894f5f4f5742e2897d20bdcac7706a
```

说明：你需要通过注册自己的开发者密钥，可以通过如下网站

<https://openexchangerates.org/signup/free>注册获取，上面的代码只是例子，不能正常运行的。

请每位同学注册各自的开发者密钥（因为屏蔽网站的原因，可能需要翻墙才能显示Human Test这部分内容）

Please fill in your information below, then hit 'Continue' to begin.

Email:

Password:

Full Name:

Website:

Human Test: ☐

☐ Please notify me of changes to the API (strongly recommended).

☒ I have read and understood the [Terms & Conditions](#) (required).

获取开发者密钥

在MainActivity.java中定义一个getKey()，这里将使用AssetManager来读取

```
private String getKey(String keyName) {
    AssetManager assetManager = this.getResources().getAssets();
    Properties properties = new Properties();
    try {
        InputStream inputStream = assetManager.open("keys.properties");
        properties.load(inputStream);

    } catch (IOException e) {
        e.printStackTrace();
    }
    return properties.getProperty(keyName);
}
```

考虑到文件操作对资源开销较为昂贵，我们只是在onCreate()方法里面去读取一次，然后把它放到MainActivity的mKey的成员里面。代码如下所示：

```
public static final String FOR = "FOR_CURRENCY";
public static final String HOM = "HOM_CURRENCY";
```

```
//this will contain my developers key
private String mKey;
//used to fetch the 'rates' json object from openexchangerates.org
public static final String RATES = "rates";
public static final String URL_BASE =
    "http://openexchangerates.org/api/latest.json?app_id=";
//used to format data from openexchangerates.org
private static final DecimalFormat DECIMAL_FORMAT = new
    DecimalFormat("#,##0.00000");
```

```
//this will contain my developers key
private String mKey;
//used to fetch the 'rates' json object from openexchangerates.org
public static final String RATES = "rates";
public static final String URL_BASE =
    "http://openexchangerates.org/api/latest.json?app_id=";
//used to format data from openexchangerates.org
private static final DecimalFormat DECIMAL_FORMAT = new
    DecimalFormat("#,##0.00000");
```

在方法在最后给mKey赋值，语句如下：

```
mKey = getKey("open_key");
```

```
mCalcButton.setOnClickListener(new View.OnClickListener() {
    @Override
    public void onClick(View v) {

    }
});
```

```
mKey = getKey("open_key");
```

钱币转换任务

通过线程的方法实现。

在android的设计思想中，为了确保用户顺滑的操作体验。一些耗时的任务不能够在UI线程中运行，像访问网络就属于这类任务。因此我们必须重新开启一个后台线程运行这些任务。然而，往往这些任务最终又会直接或者间接的需要访问和控制UI控件。例如访问网络获取数据，然后将这些数据处理显示出来。就出现了上面所说的情况。原本这是在正常不过的现象了，但是android规定除了UI线程外，其他线程都不可以对那些UI控件访问和操控。为了解决这个问题，于是就引出了我们今天的话题。Android中后台线程如何与UI线程交互。

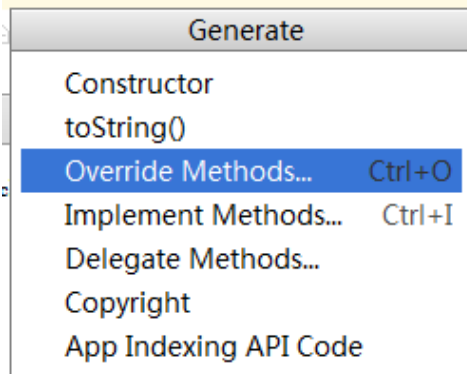
定义一个内部类

```
private class CurrencyConverterTask extends AsyncTask<String, Void, JSONObject>
{

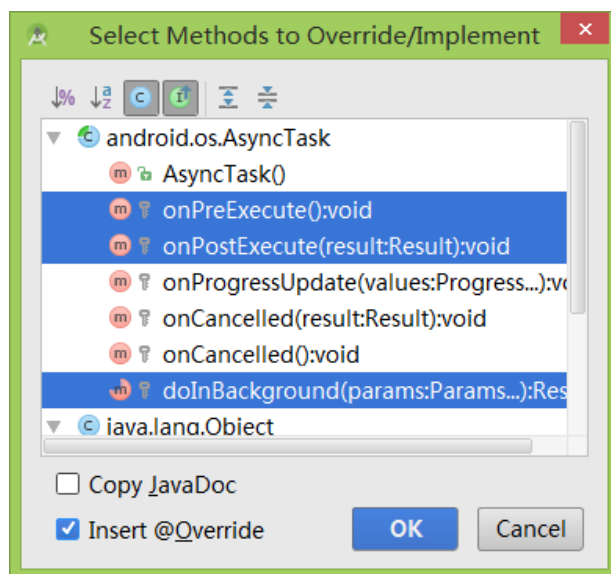
}
```

把光标放在括号中间的空白处，输入 Alt+Insert，选择 Override Methods

```
private class CurrencyConverterTask extends AsyncTask<String, Void, JSONObject>
{
```



再选择如下选项：



得到如下代码：

```

private class CurrencyConverterTask extends AsyncTask<String, Void, JSONObject>
{
    @Override
    protected void onPostExecute(JSONObject jsonObject) {
        super.onPostExecute(jsonObject);
    }

    @Override
    protected void onPreExecute() {
        super.onPreExecute();
    }

    @Override
    protected JSONObject doInBackground(String... params) {
        return null;
    }
}

```

修改代码如下:

```

private class CurrencyConverterTask extends AsyncTask<String, Void,
JSONObject> {
    private ProgressDialog progressDialog;
    @Override
    protected void onPreExecute() {
        progressDialog = new ProgressDialog(MainActivity.this);
        progressDialog.setTitle("Calculating Result...");
        progressDialog.setMessage("One moment please...");
        progressDialog.setCancelable(true);
        progressDialog.setButton(DialogInterface.BUTTON_NEGATIVE,
            "Cancel", new DialogInterface.OnClickListener() {
                @Override
                public void onClick(DialogInterface dialog, int which)
                {
                    CurrencyConverterTask.this.cancel(true);
                    progressDialog.dismiss();
                }
            });
        progressDialog.show();
    }
    @Override
    protected JSONObject doInBackground(String... params) {
        return new JSONParser().getJSONFromUrl(params[0]);
    }
    @Override
    protected void onPostExecute(JSONObject jsonObject) {

```

```

        double dCalculated = 0.0;
        String strForCode =

extractCodeFromCurrency(mCurrencies[mForSpinner.getSelectedItemPosition()]);
        String strHomCode =
extractCodeFromCurrency(mCurrencies[mHomSpinner.
        getSelectedItemPosition()]);
        String strAmount = mAmountEditText.getText().toString();
        try {
            if (jsonObject == null) {
                throw new JSONException("no data available.");
            }
            JSONObject jsonRates = jsonObject.getJSONObject(RATES);
            if (strHomCode.equalsIgnoreCase("USD")) {
                dCalculated = Double.parseDouble(strAmount) /
jsonRates.getDouble(strForCode);
            } else if (strForCode.equalsIgnoreCase("USD")) {
                dCalculated = Double.parseDouble(strAmount) *
jsonRates.getDouble(strHomCode) ;
            }
            else {
                dCalculated = Double.parseDouble(strAmount) *
jsonRates.getDouble(strHomCode)
                / jsonRates.getDouble(strForCode) ;
            }
        } catch (JSONException e) {
            Toast.makeText(
                MainActivity.this,
                "There's been a JSON exception: " + e.getMessage(),
                Toast.LENGTH_LONG
            ).show();
            mConvertedTextView.setText("");
            e.printStackTrace();
        }
        mConvertedTextView.setText(DECIMAL_FORMAT.format(dCalculated) + "
" + strHomCode);
        progressDialog.dismiss();

        //for testing
        // if (mCurrencyTaskCallback != null) {
        //     mCurrencyTaskCallback.executionDone();
        // }
    }
}

```

执行按钮事件

在按钮事件中执行钱币转换的任务

语句如下：

```
new CurrencyConverterTask().execute(URL_BASE+mKey);
```

位置如下所示：

```
mCalcButton.setOnClickListener(new View.OnClickListener() {  
    @Override  
    public void onClick(View v) {  
        new CurrencyConverterTask().execute(URL_BASE+mKey);  
    }  
});  
mKey = getKey("open_key");
```