

# Android Studio

CSC3054 / CSC7054

Creating Efficient Code

The Event Build App

## Code Efficiency

Choosing the right algorithms and data structures should always be your priority. There are two basic rules for writing efficient code:

- Don't do work that you don't need to do.
- Don't allocate memory if you can avoid it.

One of the trickiest problems you'll face when micro-optimizing an Android app is that your app is certain to be running on multiple types of hardware. To ensure your app performs well across a wide variety of devices, ensure your code is efficient at all levels.

## Exercise 1 – Open the Event Build App

Open the event build app that you have previously created. The code is as follows:

### activity\_main.xml

```
<?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:orientation="vertical" >

    <Button
        android:id="@+id/button_1"
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:text="@string/button_1"/>

    <Button
        android:id="@+id/button_2"
        android:layout_height="wrap_content"
        android:layout_width="match_parent"
        android:text="@string/button_2"/>

    <TextView
        android:id="@+id/text_id"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:capitalize="characters"
        android:text="@string/hello_world" />

</LinearLayout>
```

## MainActivity.java

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

public class MainActivity extends Activity {

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

        //--- find both the buttons---
        Button sButton = (Button) findViewById(R.id.button_1);
        Button lButton = (Button) findViewById(R.id.button_2);

        // -- register click event with first button --
        sButton.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                // --- find the text view --
                TextView txtView = (TextView) findViewById(R.id.text_id);
                // -- change text size --
                txtView.setTextSize(14);
            }
        });

        // -- register click event with second button --
        lButton.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                // --- find the text view --
                TextView txtView = (TextView) findViewById(R.id.text_id);
                // -- change text size --
                txtView.setTextSize(24);
            }
        });
    }
}
```

The code above can be made more efficient first by removing the methods from inside the `onCreate()` method and by creating one method outside of the `onCreate()` that can be called on both button objects:

### MainActivity.java

```
package com.example.eventbuild;

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

public class MainActivity extends Activity {

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

        //--- find both the buttons---
        Button sButton = (Button) findViewById(R.id.button_1);
        Button lButton = (Button) findViewById(R.id.button_2);

        buttonMethod(sButton, 14);
        buttonMethod(lButton, 24);
    }

    public void buttonMethod(View v, final int size)
    {
        v.setOnClickListener(new View.OnClickListener() {
            public void onClick(View v) {
                // --- find the text view --
                TextView txtView = (TextView) findViewById(R.id.text_id);
                // -- change text size --
                txtView.setTextSize(size);
            }
        });
    }
}
```



## Use an Interface

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

public class MainActivity extends Activity implements View.OnClickListener {

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

        //--- find both the buttons---
        Button sButton = (Button) findViewById(R.id.button_1);
        Button lButton = (Button) findViewById(R.id.button_2);

        sButton.setOnClickListener(this);
        lButton.setOnClickListener(this)
    }

    @Override
    public void onClick(View v) {
        switch(v.getId()){
            case R.id.button_1:
                changeTextSize(14);

                break;
            case R.id.button_2:
                changeTextSize(24);
                break;
        }
    }

    public void changeTextSize(int size){
        TextView txtView = (TextView) findViewById(R.id.text_id);
        // -- change text size --
        txtView.setTextSize(size);
    }
}
```

## Use an Injection Library

Annotate fields with `@Bind` and a view ID for Butter Knife to find and automatically cast the corresponding view in your layout.

### Step 1: Open Module settings via the Project Explorer

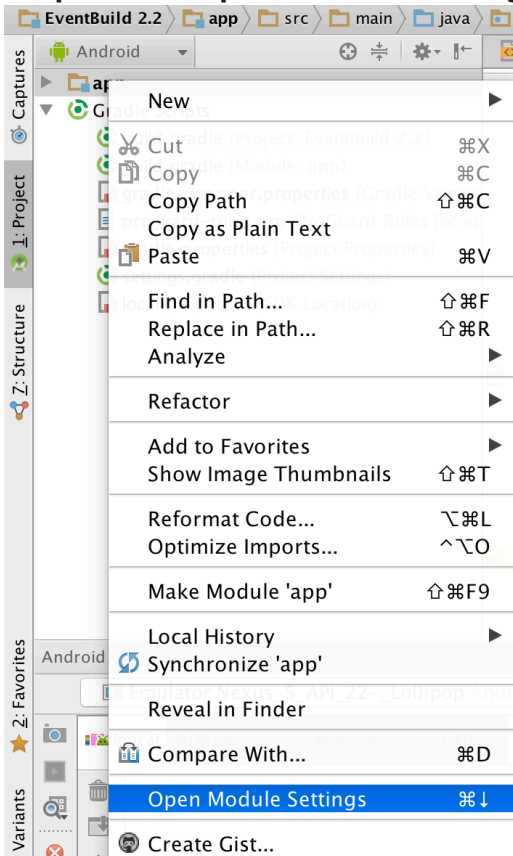


FIGURE 1 PROJECT EXPLORER

## Step 2: Go to dependencies

Click on the "+" symbol at the bottom of the screen and choose "Library dependency" as shown in figure 2

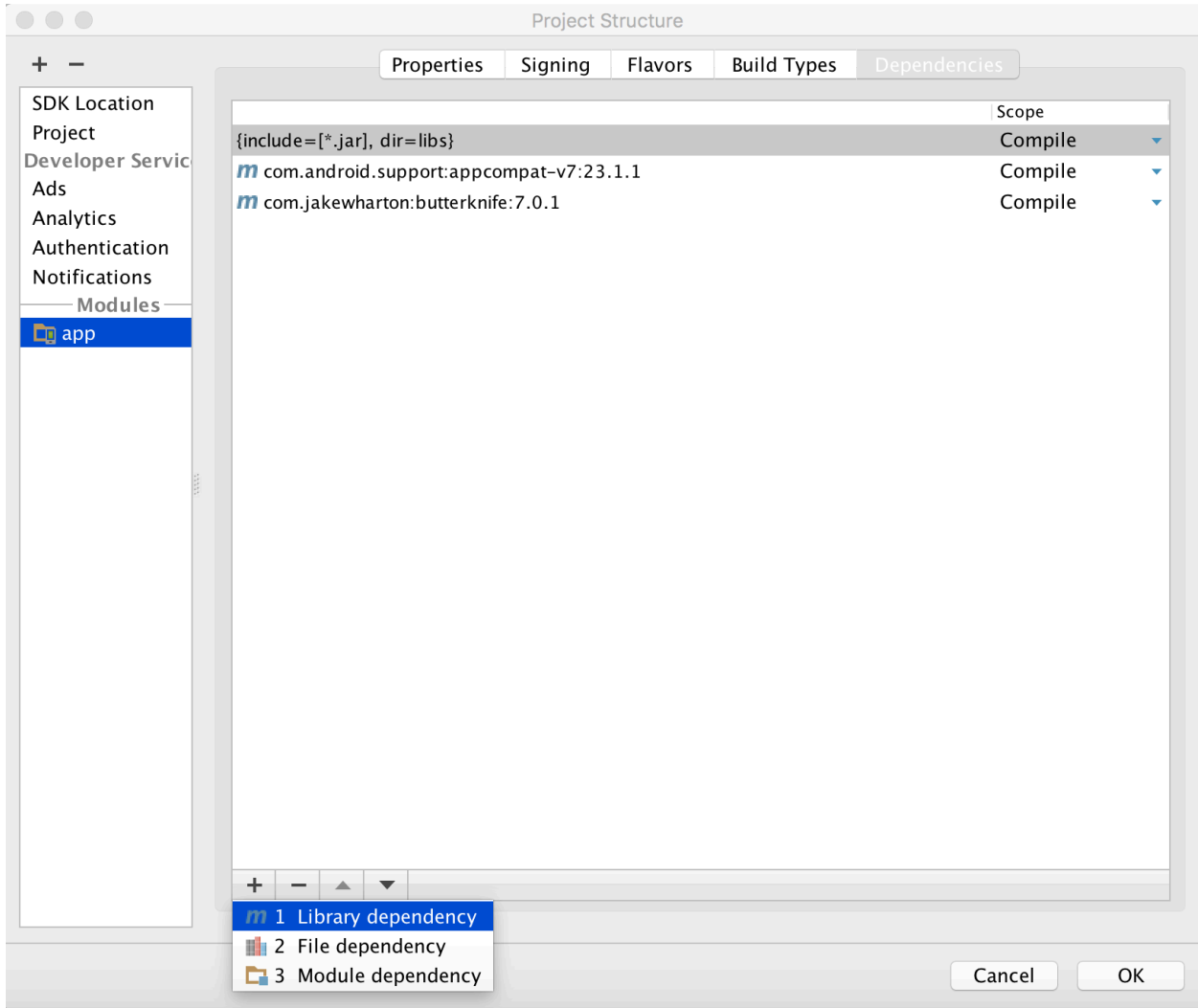


FIGURE 2 - MODULE SETTINGS

## Step 3 Search for butterknife

Type in "butterknife" and press "ok" as shown in figure 3

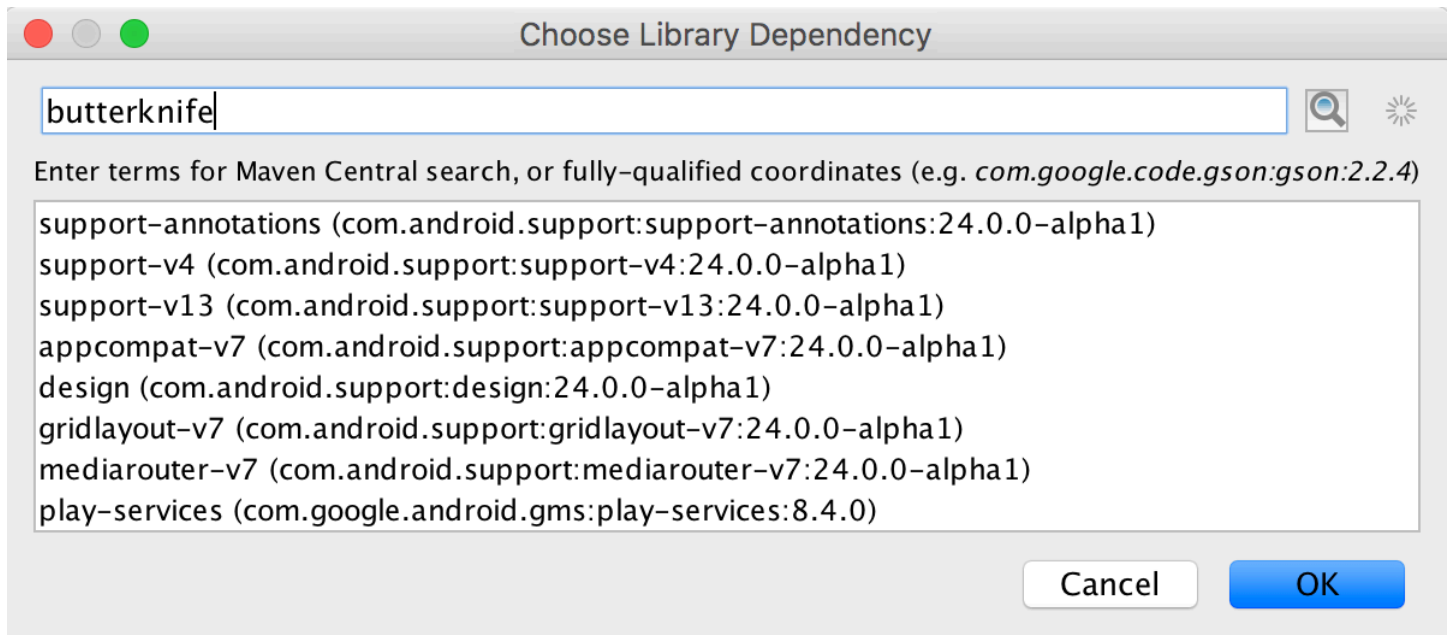
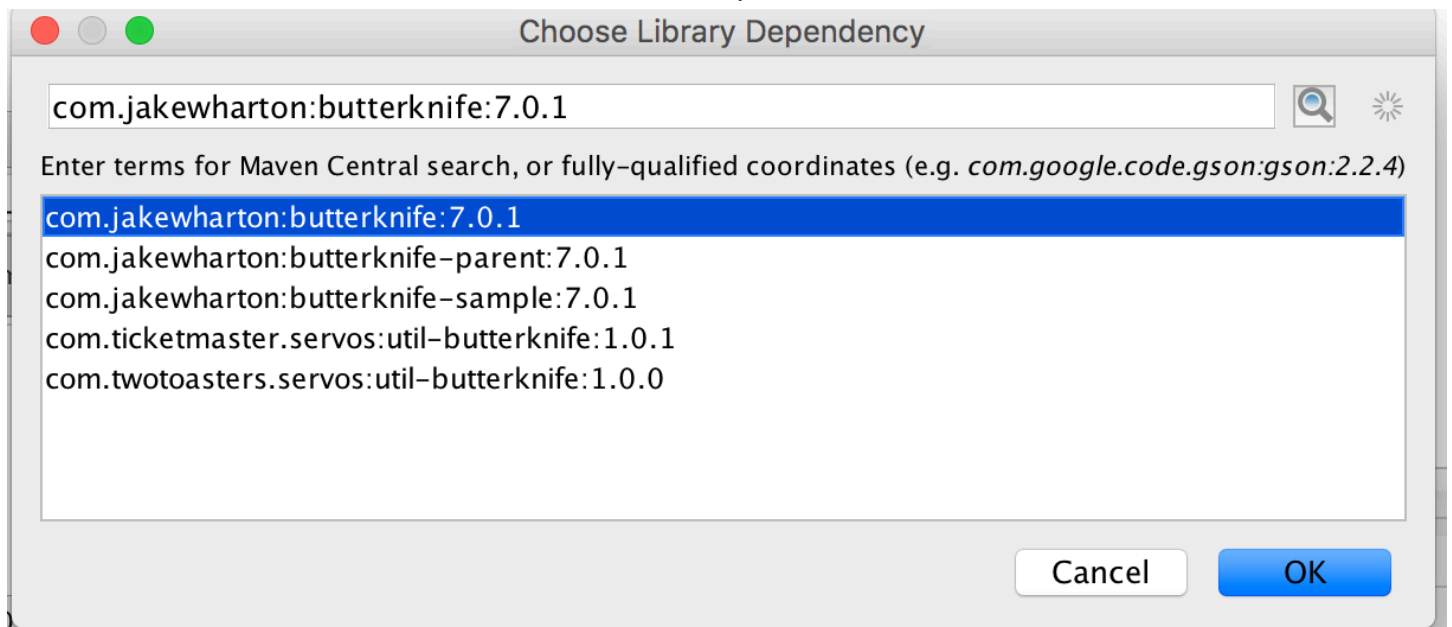


FIGURE 3 SEARCH FOR LIBRARY

## Step 4 Select the library to be added

Select "com.jakewharton:butterknife:7.0.1" and press "ok"





The library will be added to the project as shown in figure 4

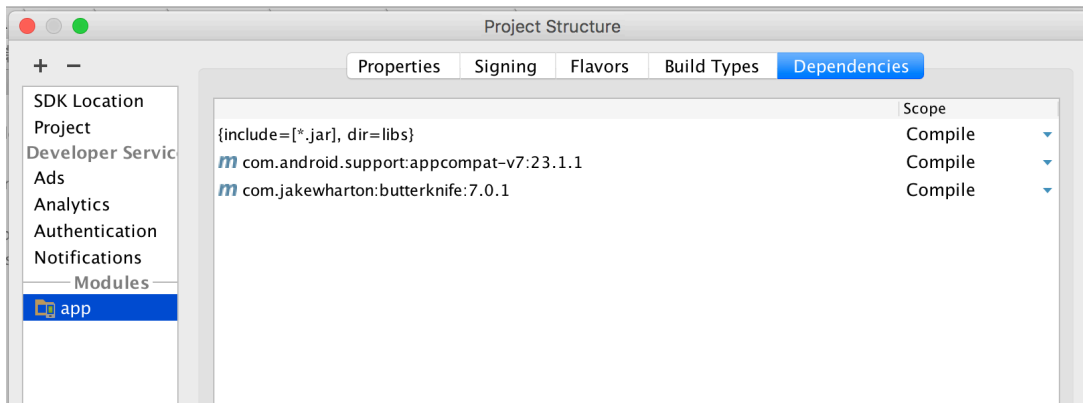


FIGURE 4 - ADDED LIBRARY

## Step 5 Update Code

```
import android.os.Bundle;
import android.app.Activity;
import android.view.View;
import android.widget.Button;
import android.widget.TextView;
import butterknife.Bind;
import butterknife.ButterKnife;

public class MainActivity extends Activity implements View.OnClickListener {

    @Bind(R.id.button_1) Button sButton;
    @Bind(R.id.button_2) Button lButton;
    @Bind(R.id.text_id) TextView tv;

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
        ButterKnife.bind(this);
        sButton.setOnClickListener(this);
        lButton.setOnClickListener(this);
    }

    @Override
    public void onClick(View v) {
        switch(v.getId()){
            case R.id.button_1:
                changeTextSize(14);

                break;
            case R.id.button_2:
                changeTextSize(24);
                break;
        }
    }

    public void changeTextSize(int size){
        tv.setTextSize(size);
    }
}
```