



안드로이드 구성

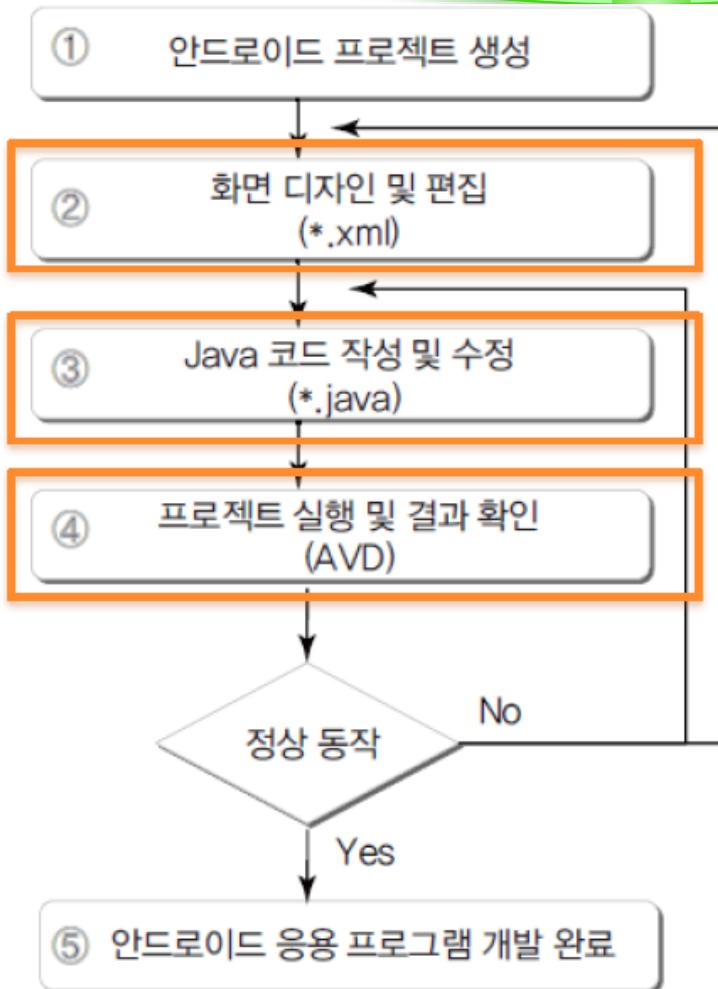
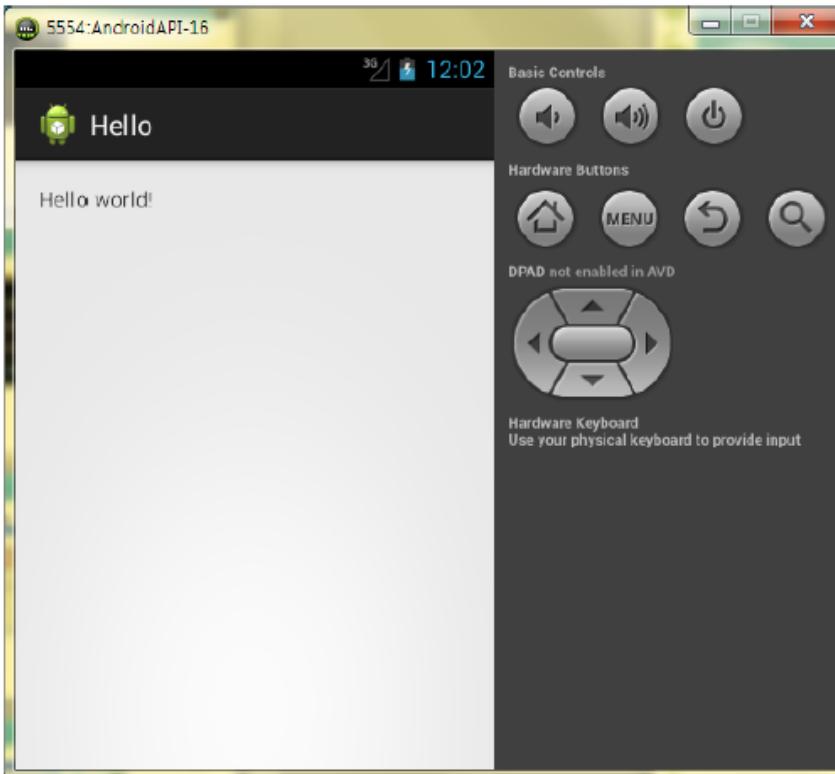


구성 내용

- 프로젝트 만들기
- 자동 생성 소스 분석
- 프로그램 구조 및 사용자 인터페이스
- AVD 명칭과 사용법
- 유용한 기능

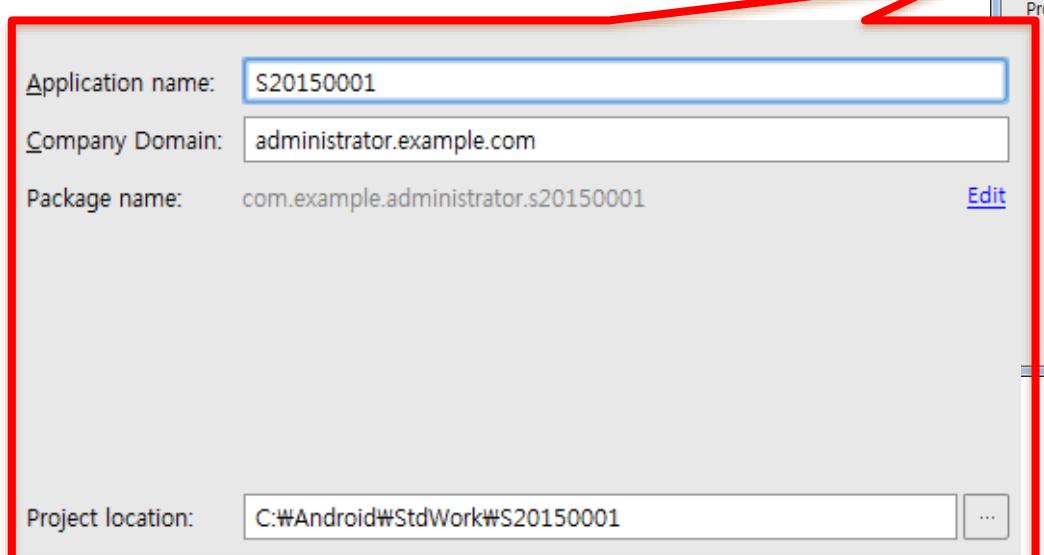
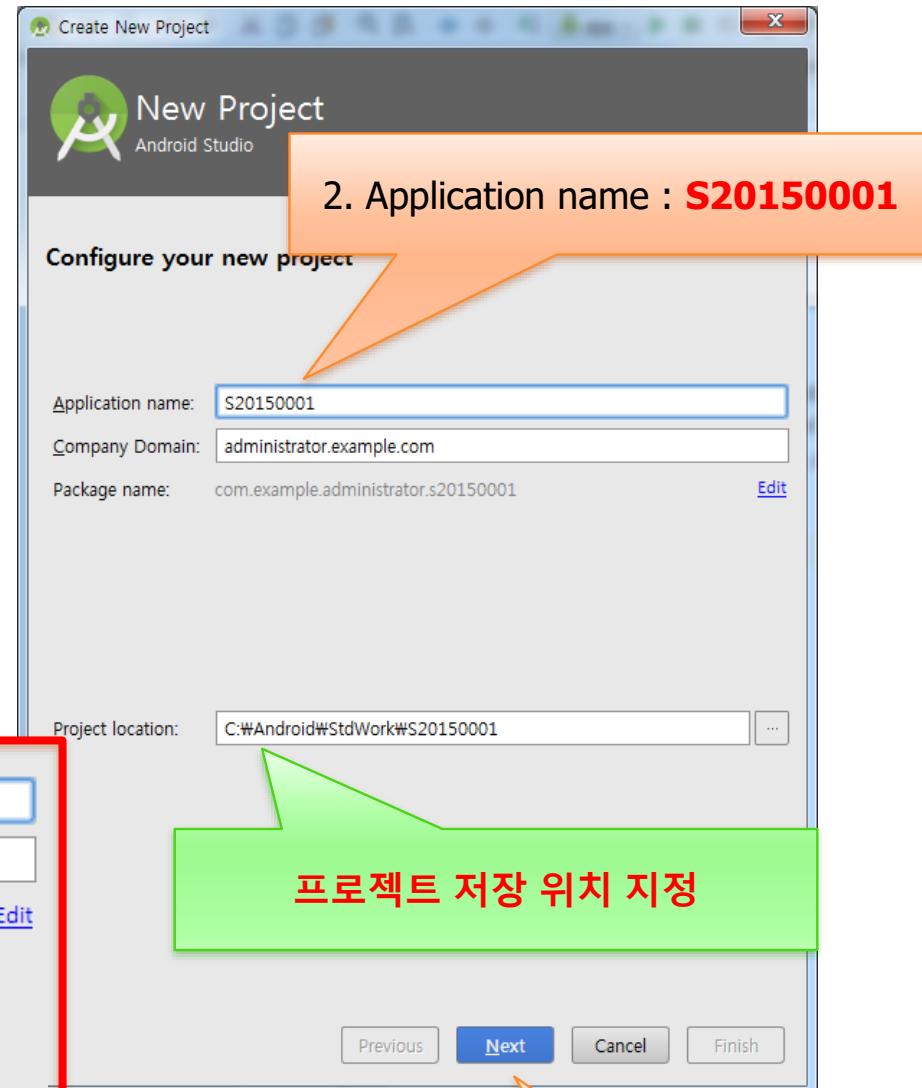
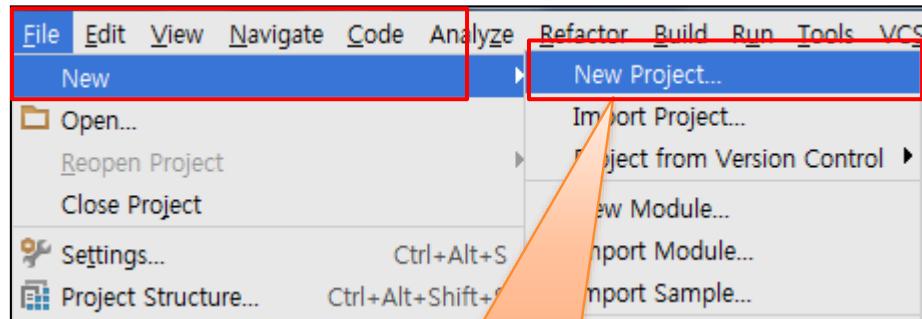


프로젝트 만들기



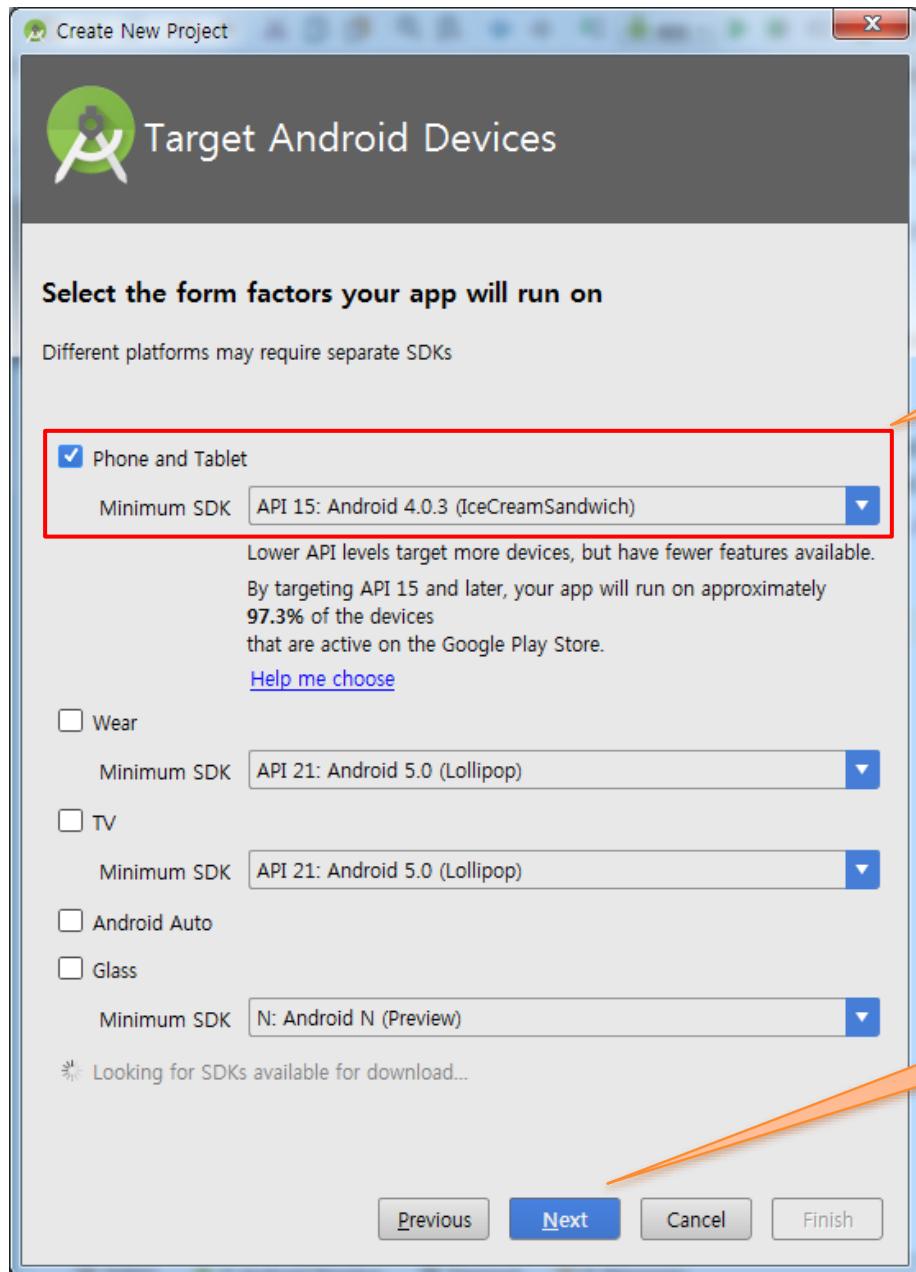
「안드로이드 프로젝트 개발 단계」





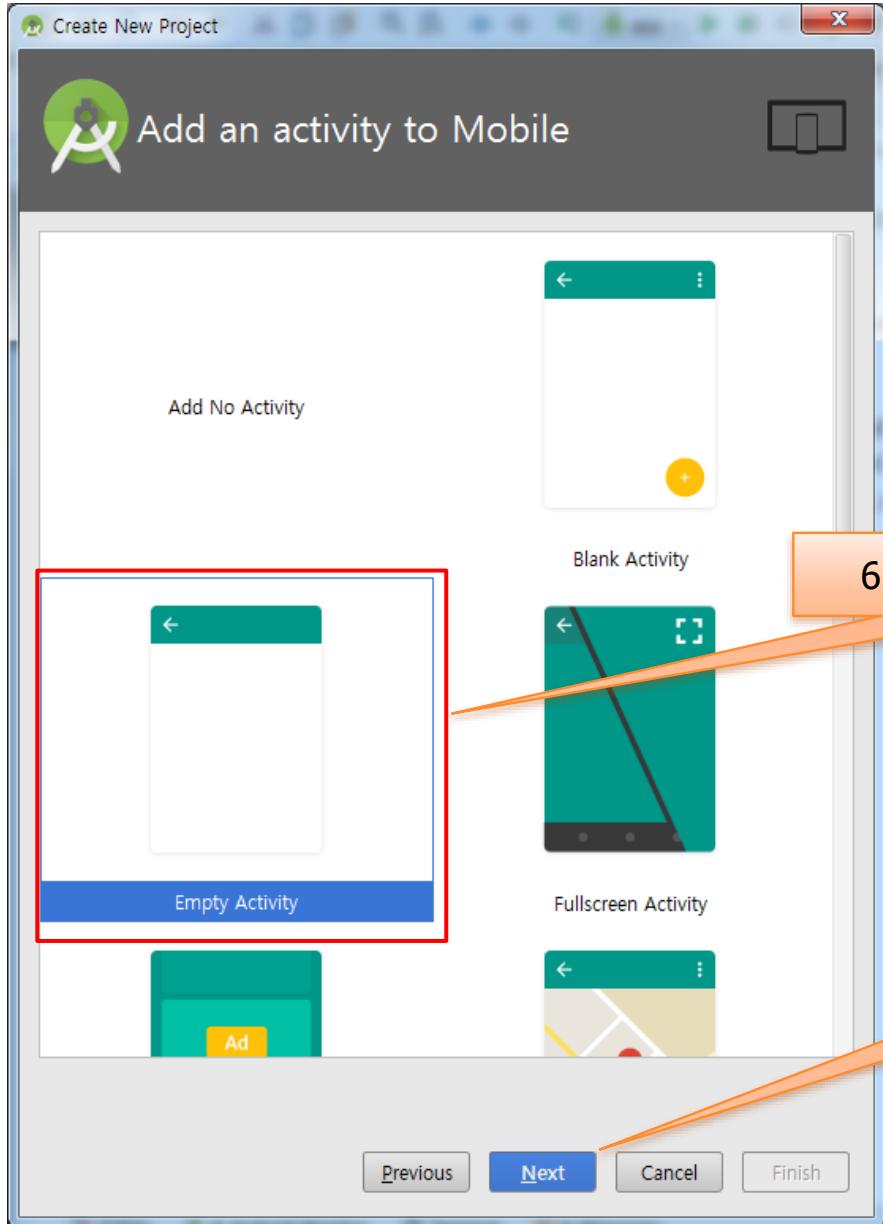
3. 클릭

- Application Name: 사용자에게 보이는 애플리케이션 이름
- Company Domain: 프로젝트를 홈페이지 주소와 같이 소속 및 그룹을 구분할 수 있도록 관리
- Package Name: 애플리케이션이 속하는 패키지 이름 패키지는 여러 클래스를 저장하는 박스, 패키지 이름은 충돌을 방지하기 위해 개발자의 인터넷 도메인 주소를 역순으로 입력하는 것은 권장
- Minimum SDK: 애플리케이션이 실행될 수 있는 타깃 장치의 최소 SDK 버전



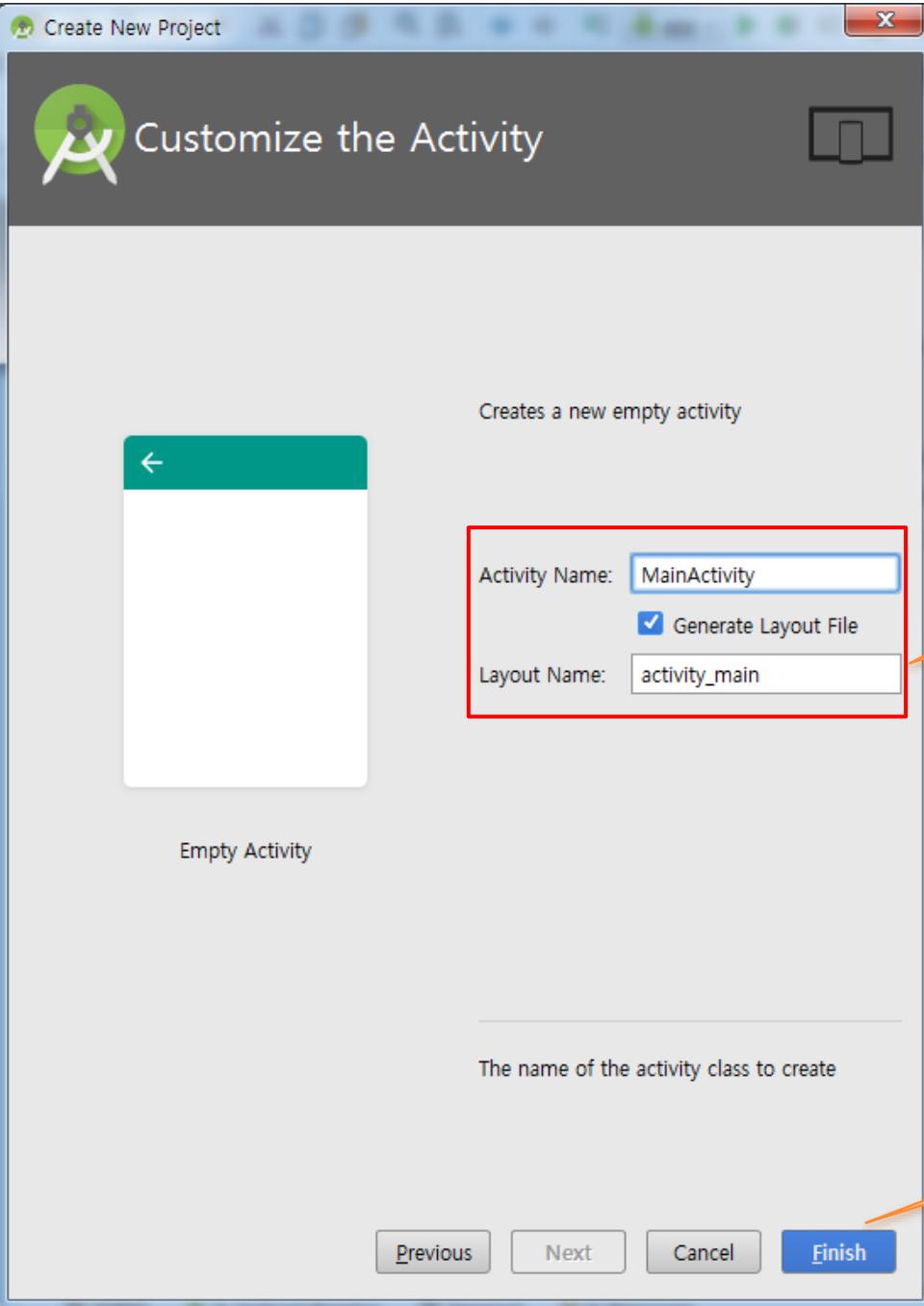
4. 개발한 앱이 작동될 안드로이드
최소 버전 지정

5. 클릭



6. “Empty Activity” 선택

7. 클릭

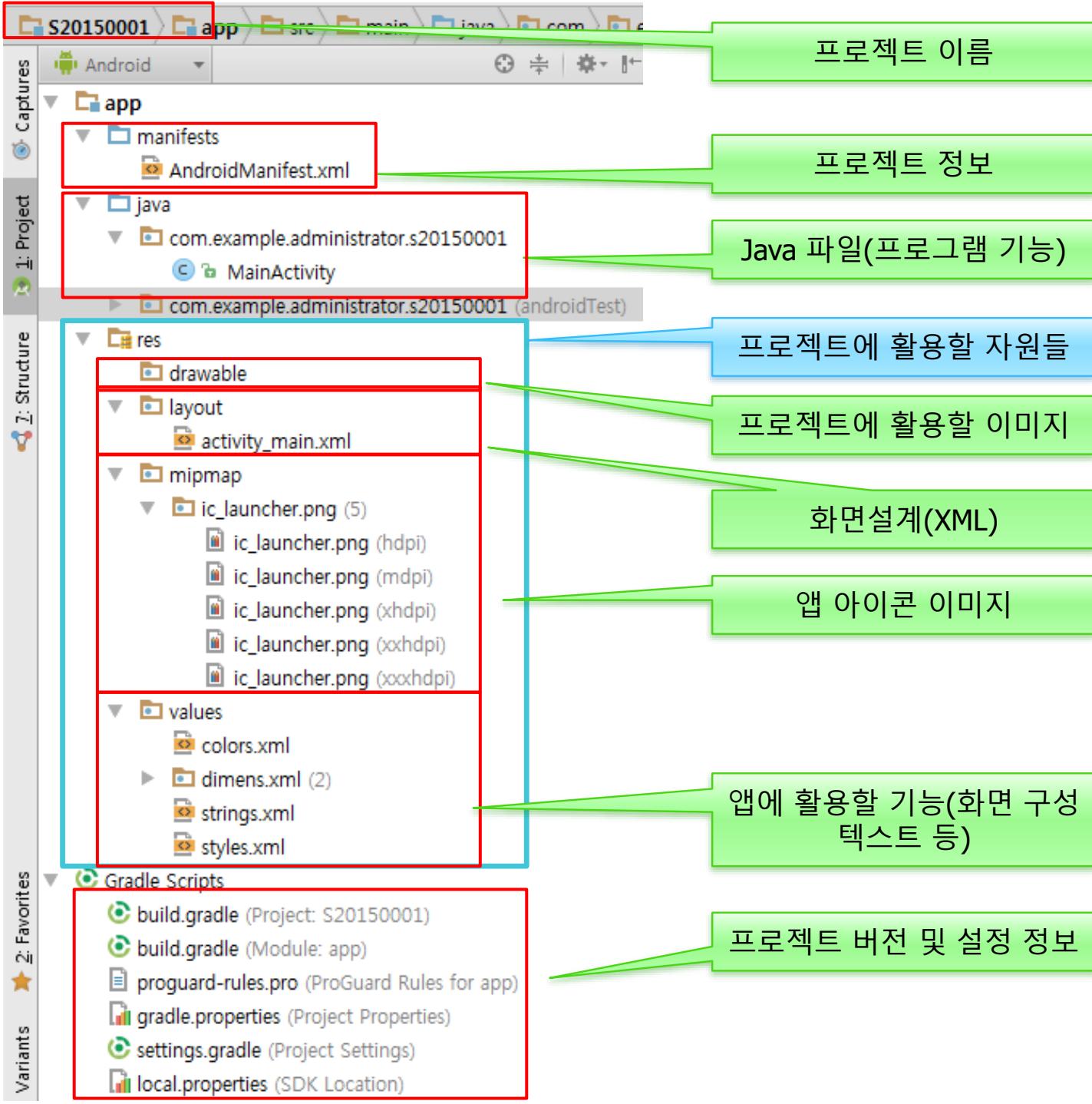


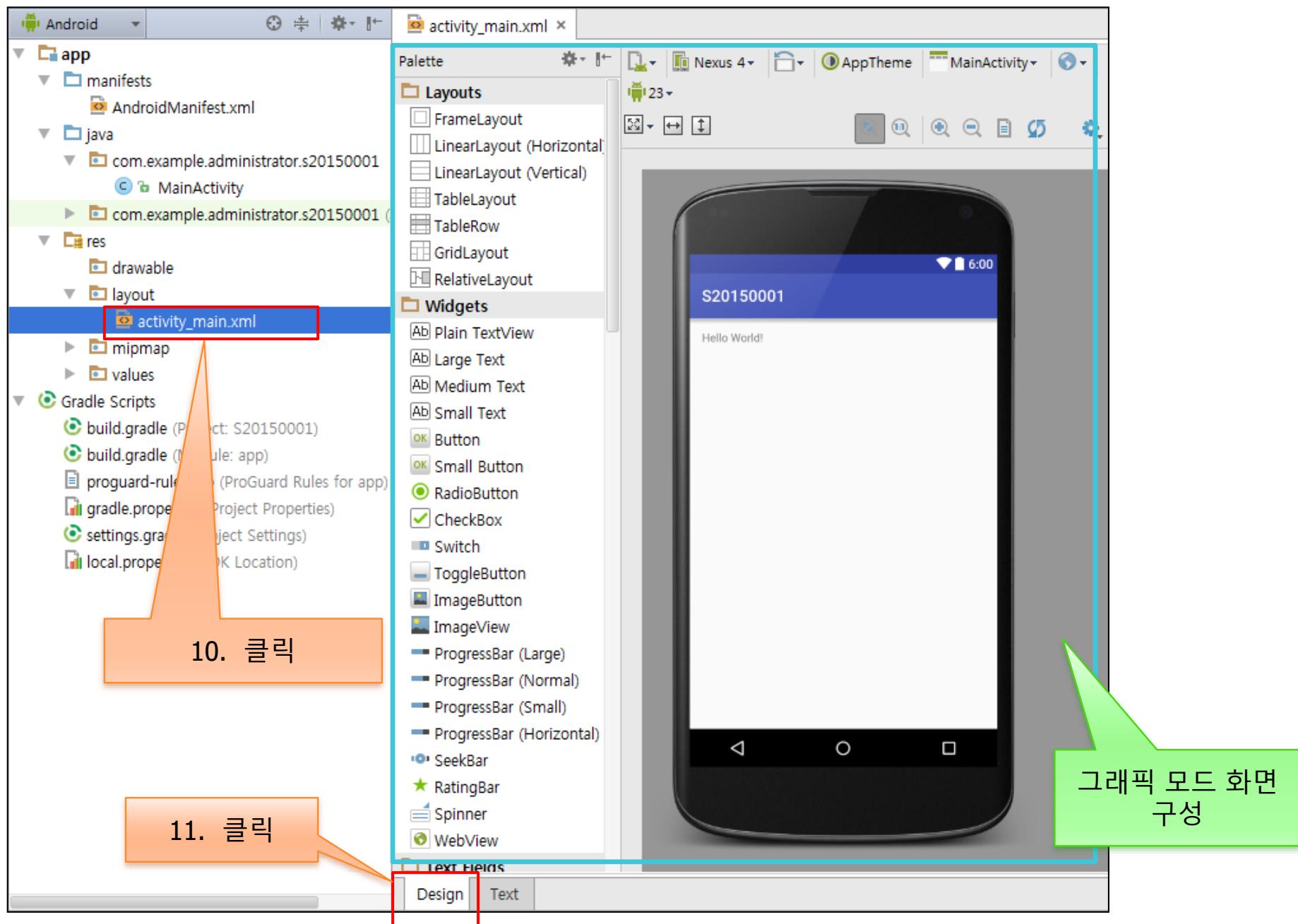
8. 파일명 지정

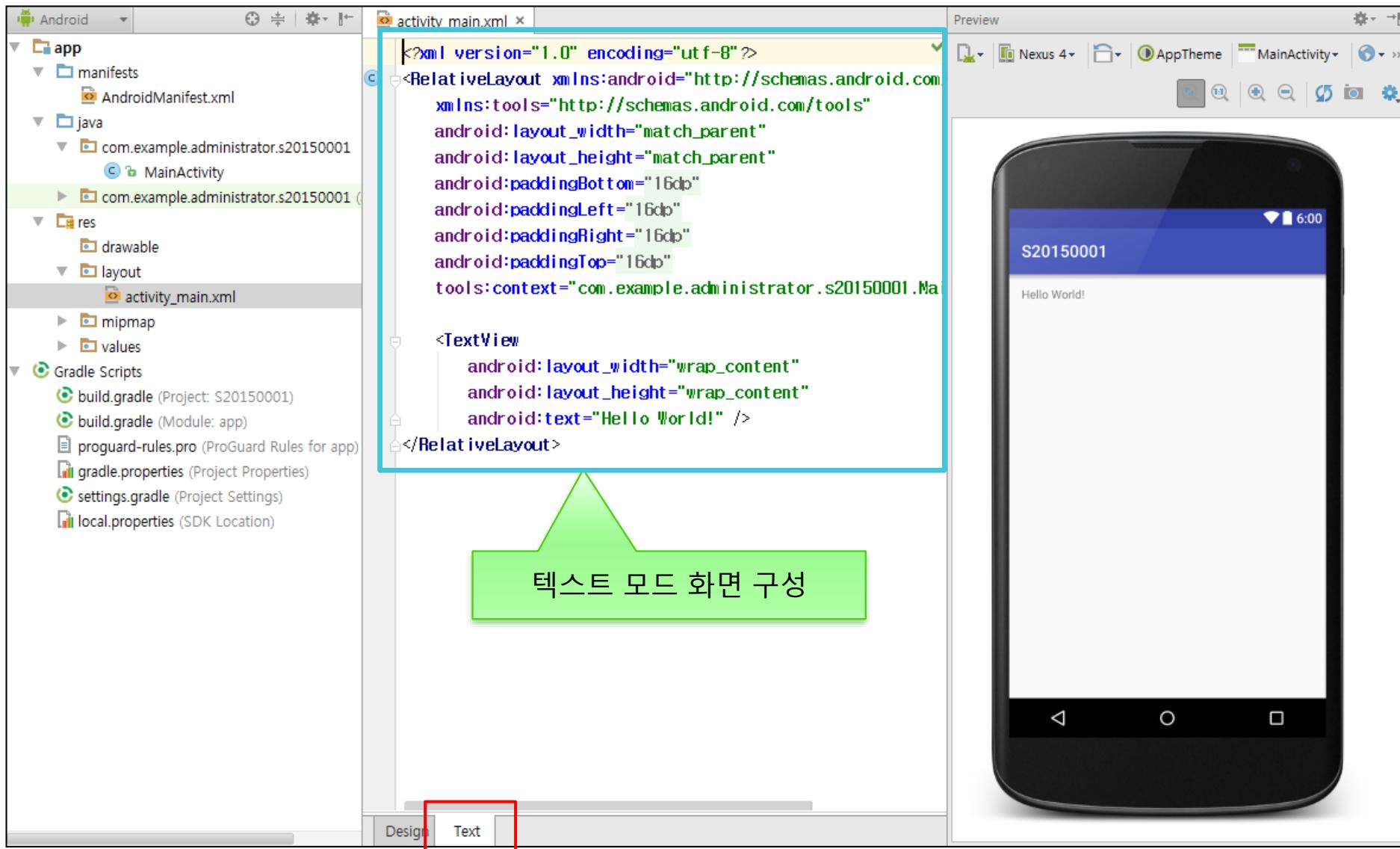
Activity Name : MainActivity

Layout Name : activity_main

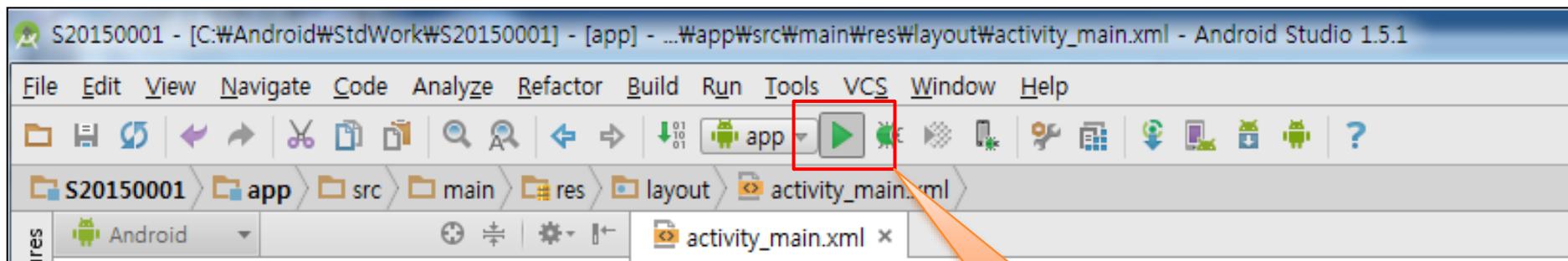
9. 클릭



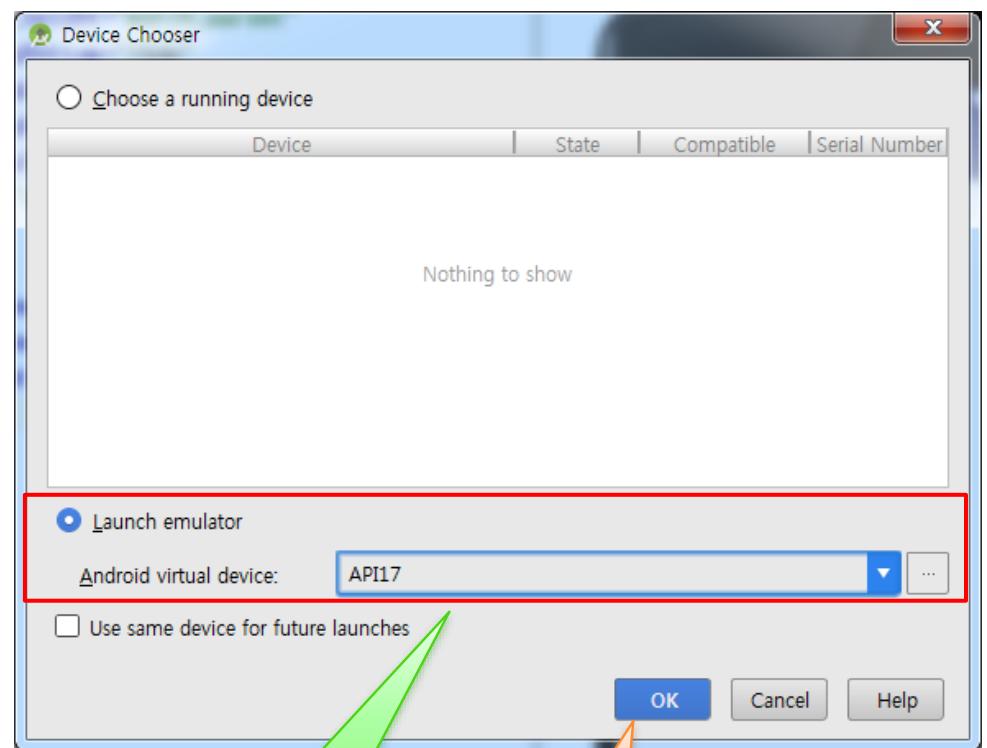




12. 클릭

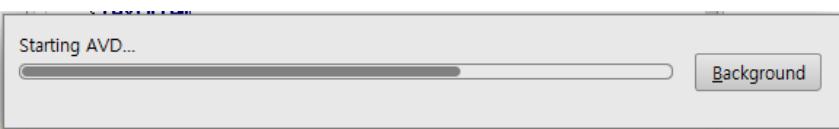


13. 클릭



실행시킬 AVD 지정

14. 클릭



The screenshot shows an Android emulator window titled "5554:API17". The device screen displays the text "Hello World!" in a white font on a blue background. At the top of the screen, there is a status bar with icons for signal strength, battery level, and time (6:49). A navigation bar below the status bar contains the text "S20150001". On the right side of the screen, a "Developer Options" overlay is visible, showing icons for basic controls (volume, power), hardware buttons (Home, Menu, Back, Search), and a note that "DPAD not enabled in AVD". Below these are icons for a hardware keyboard and a trackball. The bottom half of the screen shows the XML code for the activity.

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="16dp"
    android:paddingLeft="16dp"
    android:paddingRight="16dp"
    android:paddingTop="16dp"
    tools:context="com.example.administrator.s20150001.MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!" />
</RelativeLayout>
```

AVD 추가 및 설정

14

The screenshot shows the Android Studio interface with the title bar "S20150001 - [C:\Android\StdWork\S20150001] - [app] - ...app\src\main\res\layout\activity_main.xml - Android Studio 1.5.1". The toolbar includes icons for File, Edit, View, Navigate, Code, Analyze, Refactor, Build, Run, Tools, VCS, Window, and Help. The navigation bar shows the project structure: S20150001 > app > src > main > res > layout > activity_main.xml. The bottom tabs show "Android" selected.

The main window displays the "Android Virtual Device Manager" titled "Your Virtual Devices". It lists three existing devices:

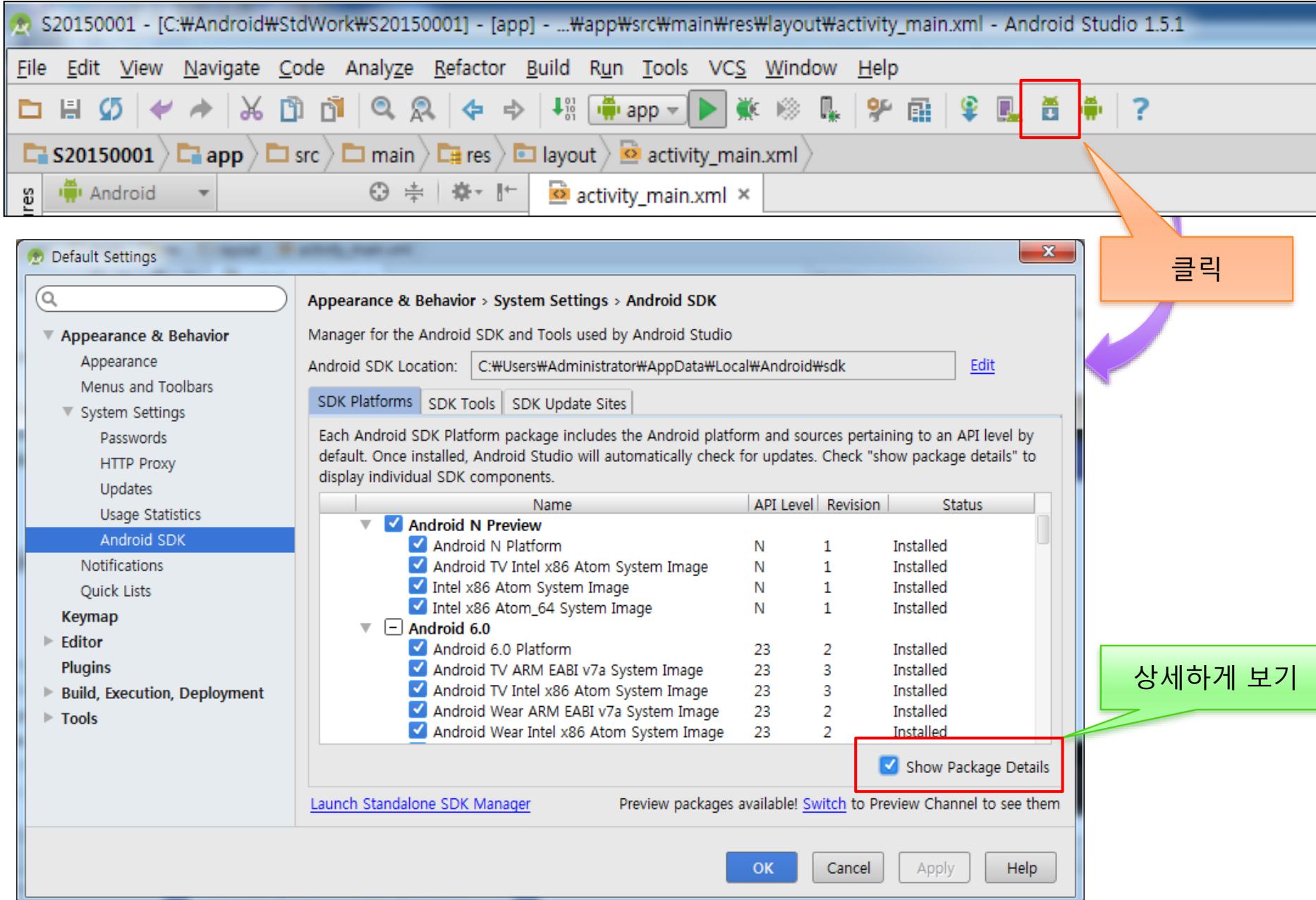
Type	Name	Resolution	API	Target	CPU/ABI	Size on Disk	Actions
Tablet	API17	480 x 800	17	Android 4.2	mips	166 MB	
Tablet	API21G	320 x 480	21	Google API	arm	1 GB	
Tablet	API23	480 x 800	23	Android 6.0	x86	1 GB	

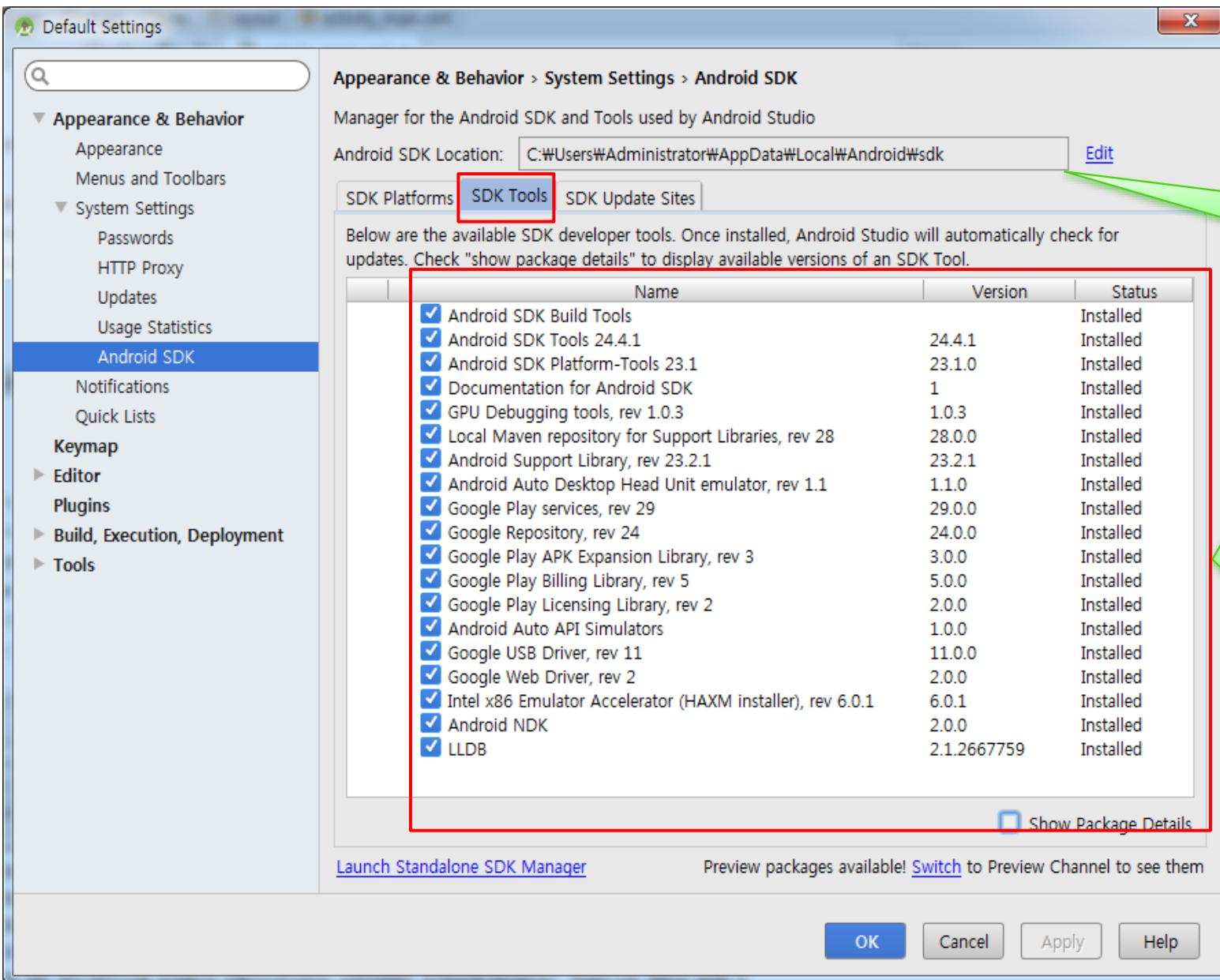
A red box highlights the "Create Virtual Device..." button at the bottom left of the manager window. An orange callout with the text "클릭" (Click) points to the same button.

A purple arrow points from the "Create Virtual Device..." button to the "Virtual Device Configuration" dialog window, which is overlaid on the main manager window. This dialog is titled "Select Hardware" and shows a list of available devices under the "Phone" category:

Category	Name	Size	Resolution	Density
TV	Nexus S	4.0"	480x800	hdpi
Wear	Nexus One	3.7"	480x800	hdpi
Phone	Nexus 6P	5.7"	1440x2560	560dpi
Tablet	Nexus 6	5.96"	1440x2560	560dpi
	Nexus 5X	5.2"	1080x1920	420dpi
	Nexus 5	4.95"	1080x1920	xxhdpi
	Nexus 4	4.7"	768x1280	xhdpi
	Galaxy Nexus	4.65"	720x1280	xhdpi
	Android Wear Square	1.65"	280x280	hdpi
	Android Wear Round	1.65"	320x320	hdpi
	5.4" FWVGA	5.4"	480x854	mdpi
	5.1" WVGA	5.1"	480x800	mdpi
	4.7" WXGA	4.7"	720x1280	xhdpi

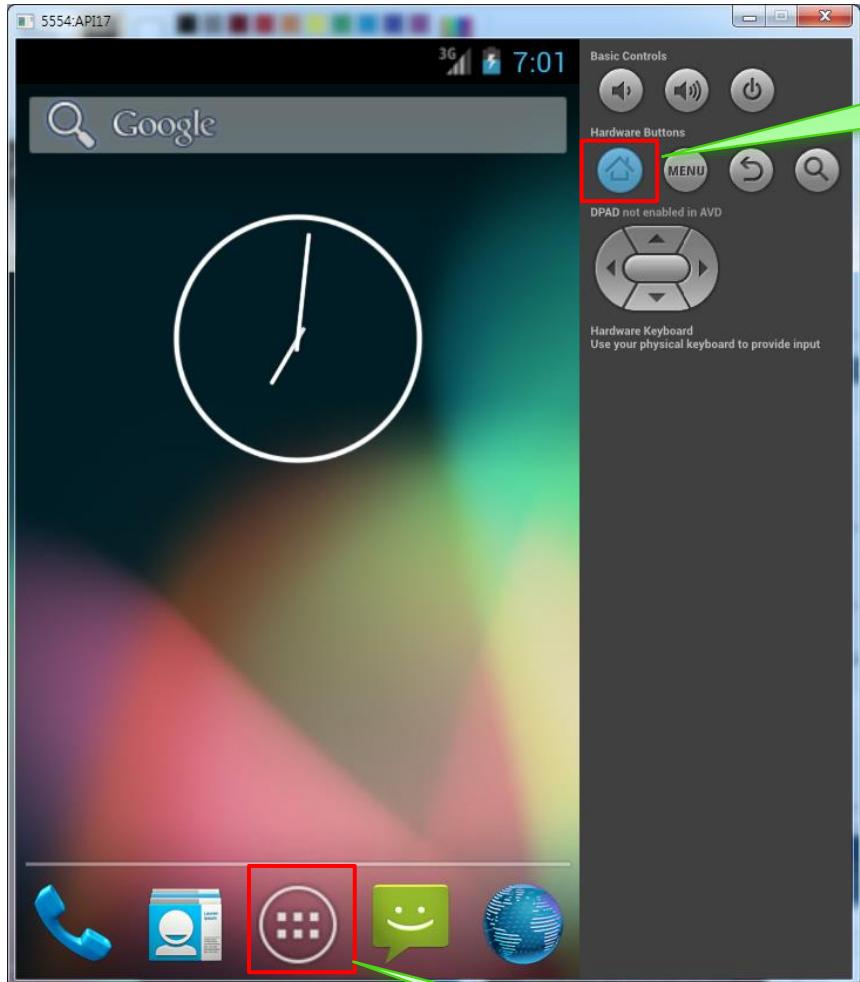
An orange callout with the text "클릭" (Click) points to the "Nexus 5" device entry in the list. A detailed view of the "Nexus 5" device is shown on the right side of the dialog, including its dimensions (1080px width, 1920px height), size (normal), ratio (normal), and density (xxhdpi). Buttons for "New Hardware Profile", "Import Hardware Profiles", "Clone Device...", "Previous", "Next", "Cancel", and "Finish" are visible at the bottom of the dialog.



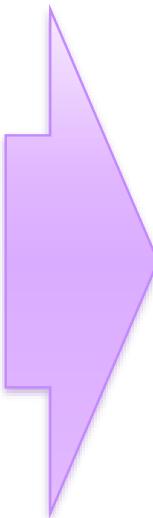


안드로이드 SDK
저장위치

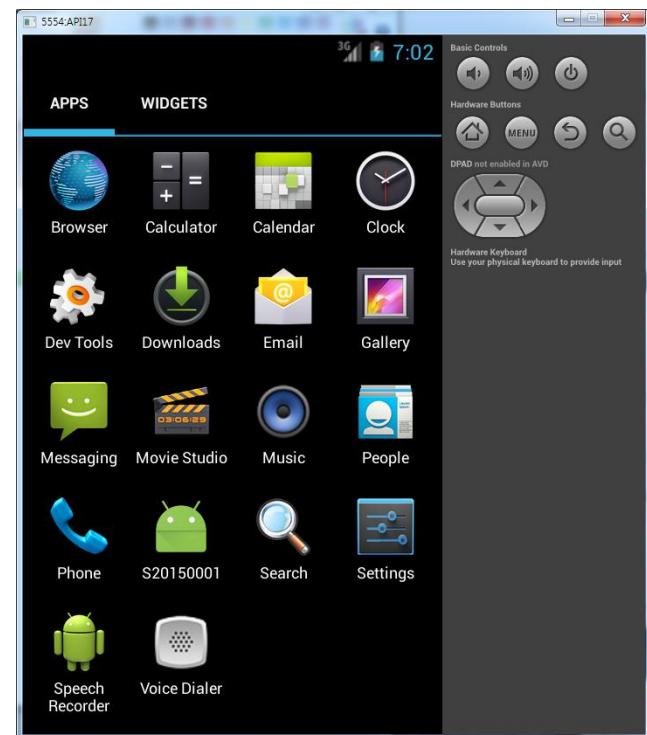
안드로이드 프로
그래밍 및 SDK
운영에 필요한
유ти리티

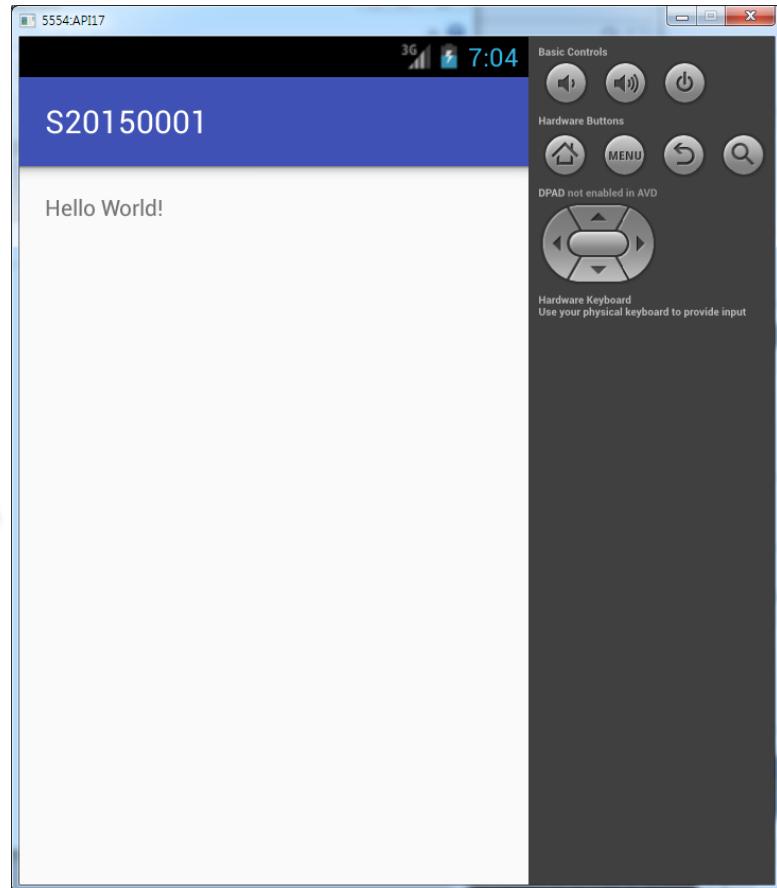


홈 화면



메뉴

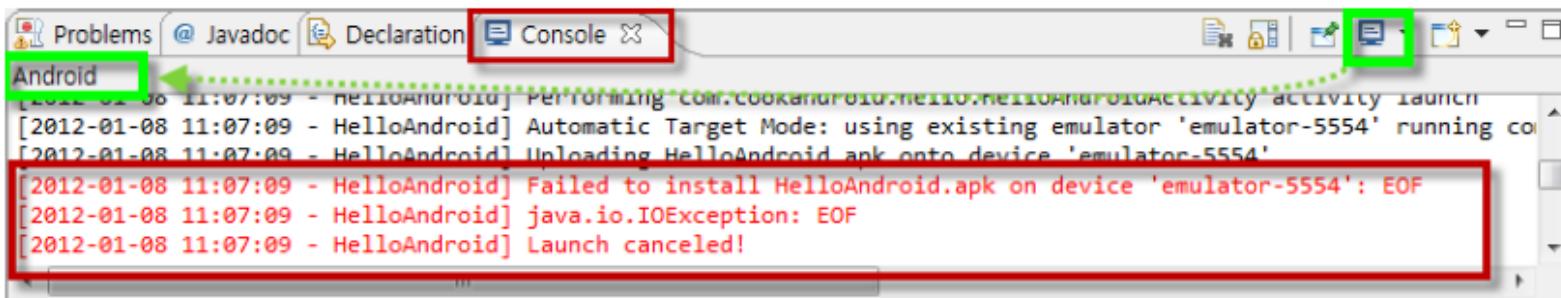




Tip. 오류처리



(참고) 프로젝트가 AVD를 인식하지 않을 때 조치법



- ① 프로젝트를 다시 실행해 본다.
- ② AVD를 종료한 후, 다시 실행해 본다.
- ③ AVD를 삭제하고 다시 만들어 본다.
- ④ 낮은(다른) 버전으로 개발한다.

Tip. 오류처리



(참고) AVD 오류 메시지의 종류와 조치법

- ▶ You may want to manually restart adb from the Devices view.
→ 프로젝트를 다시 실행
- ▶ emulator-5554 disconnected! Cancelling '패키지이름.액티비티이름 activity launch'
→ 먼저 모든 AVD를 닫은 후에 다시 프로젝트를 실행
- ▶ could not get wglGetExtensionsStringARB
→ 경고 수준. 무시해도 됨
- ▶ Launch Cancelled
→ AVD를 그냥 두고, 다시 프로젝트를 실행
- ▶ AVD는 가동되고, Starting activity 패키지이름.액티비티이름 on device emulator-5554에서 한동안 멈춘 상태
→ AVD를 그냥 두고, 다시 프로젝트를 실행

프로그래밍 구조



The screenshot shows the Android Studio interface. On the left is the Project Structure sidebar, and on the right is the code editor for `MainActivity.java`. The code defines a class `MainActivity` that extends `AppCompatActivity`.

Annotations in the code editor:

- 1. 클릭 (Click): Points to the `MainActivity` class in the Project Structure sidebar.
- 2. 패키지 명 (Package Name): Points to the package declaration: `package com.example.administrator.s20150001;`
- 3. Import: Points to the import statements:
`import android.support.v7.app.AppCompatActivity;`
`import android.os.Bundle;`
- 4. 화면 연결 (Screen Connection): Points to the line `setContentView(R.layout.activity_main);` in the `onCreate` method.

Text at the bottom left:

import 문장은 외부에서 패키지나 클래스를 포함

```
package com.example.administrator.s20150001;

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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



안드로이드 리퍼런스



<http://developer.android.com/reference/packages.html>

The screenshot shows a Microsoft Internet Explorer window displaying the Android Developers Reference for the `Activity` class. The URL in the address bar is `http://developer.android.com/reference/android/app/Activity.html`. The page title is "Activity | Android Developers". The navigation bar includes "Develop" (which is highlighted), "Design", "Distribute", and "Reference". The left sidebar lists package names, with "android.app" highlighted by a red box. Below the sidebar, there's a "Class Overview" section with a paragraph about activities. A large orange box highlights the import statement `import android.app.Activity;` at the top of the page content.

import android.app.Activity;

Activity

Summary: Constants | Inherited Constants | Fields | Ctors | Methods | Protected Methods | Inherited Methods | [Expand All]
Added in API level 1

public class Activity
extends ContextThemeWrapper
implements ComponentCallbacks2, KeyEvent.Callback, LayoutInflator.Factory2, View.OnCreateContextMenuListener, Window.Callback

java.lang.Object

↳ android.content.Context

↳ android.content.ContextWrapper

↳ android.view.ContextThemeWrapper

↳ android.app.Activity

▶ Known Direct Subclasses

AccountAuthenticatorActivity, ActivityGroup, AliasActivity, ExpandableListActivity, FragmentActivity, ListActivity, NativeActivity

▶ Known Indirect Subclasses

ActionBarActivity, LauncherActivity, PreferenceActivity, TabActivity

Class Overview

An activity is a single, focused thing that the user can do. Almost all activities interact with the user, so the Activity class takes care of creating a window for you in which you can place your UI with `setContentView(View)`. While activities are often presented to the user as full-screen windows, they can also be used in other ways: as floating windows (via a theme with

<http://developer.android.com/reference/android/app/Activity.html>

자동코드 분석



- public class MainActivity **extends** AppCompatActivity { ... }
- 클래스의 정의
- **Activity**로부터 상속받았으므로 액티비티가 된다.
- 액티비티는 안드로이드에서 애플리케이션을 구성하는 컴포넌트이다.



액티비티는 화면을 통하여 사용자와 상호작용하는 활동을 의미한다.

```

import android.support.v7.app.AppCompatActivity;
import android.os.Bundle;

public class MainActivity extends AppCompatActivity {

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

```

자동코드 분석



○ @Override

- 어노테이션의 하나
- 어노테이션은 컴파일러에게 추가적인 정보를 주는 것
- **@Override**은 메소드가 부모 클래스의 메소드를 재정의(오버라이드)하였다는 것을 나타낸다.

○ public void onCreate() { ... }

- **onCreate()** 메소드는 액티비티가 생성되는 순간에 딱 한번 호출
- 모든 초기화와 사용자 인터페이스 설정이 여기에 들어간다.

```
public class MainActivity extends AppCompatActivity {

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



자동코드 분석

- 안드로이드 애플리케이션의 실행이 시작되는 곳
 - ◉ 안드로이드에는 main()이 없음.
 - ◉ 액티비티별로 실행된다.
 - ◉ 액티비티 중에서는 *onCreate()* 메소드가 가장 먼저 실행된다.



자동코드 분석

- 사용자 인터페이스 기술

- 사용자 인터페이스 작성 방법

- 코드를 사용하는 방법(기존의 자바)

- XML을 사용하는 방법(안드로이드 선호 방법)

- 안드로이드에서는 UI 화면의 구성을 XML을 이용하여
서 선언적으로 나타내는 방법을 선호

- 애플리케이션의 외관과 애플리케이션의 Logic을 서로 분리

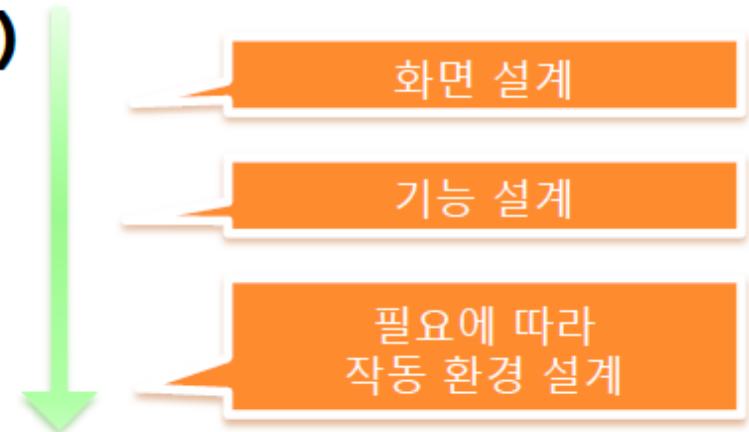
- 빠르게 UI를 구축

자동코드 분석



일반적인 애플리케이션 작성 절차

- ① 사용자 인터페이스 작성(**XML**)
- ② 자바 코드 작성(**JAVA**)
- ③ 매니페스트 파일 작성(**XML**)





XML을 이용한 사용자 인터페이스 작성

- 앞에서 코드로 작성하였던 UI를 XML로 표현하면

```
TextView tv = new TextView(this);  
tv.setText("Hello, world!");
```

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



The screenshot shows the Android Studio IDE interface. At the top, there is a toolbar with various icons. Below the toolbar is a tab bar containing four tabs: 'MainActivity.java', 'activity_main.xml', 'R.java', and 's20150001WR.java'. The 'MainActivity.java' tab is currently selected.

The main area of the interface is divided into two panes. The left pane is a file browser showing the project structure under the 'app' folder. The right pane is a code editor displaying the contents of the 'R.java' file.

The code editor has a search bar at the top with the text 'activity_ma'. The search results show multiple occurrences of this string. One specific occurrence is highlighted with a red box, and its corresponding line of code is also highlighted:

```
public static final int activity_main=0x7f040019;
```

A purple box highlights the identifier 'activity_main' in the line above. A purple arrow points from this highlighted identifier to the highlighted line of code in the R.java file.

The code editor also displays other static final integer definitions, such as:

```
public static final int abc_max_action_buttons=0x7f0a0000;  
public static final int cancel_button_image_alpha=0x7f0a0003;  
public static final int status_bar_notification_info_maxnum=0x7f0a0004;
```

The screenshot shows the Android Studio interface with the project structure on the left and the code editor on the right.

Project Structure:

- app
- manifests
- AndroidManifest.xml (highlighted with a red box)
- java
 - com.example.administrator.s20150001
 - MainActivity
- res
 - drawable
 - layout
 - activity_main.xml
 - mipmap
 - values

Code Editor (AndroidManifest.xml):

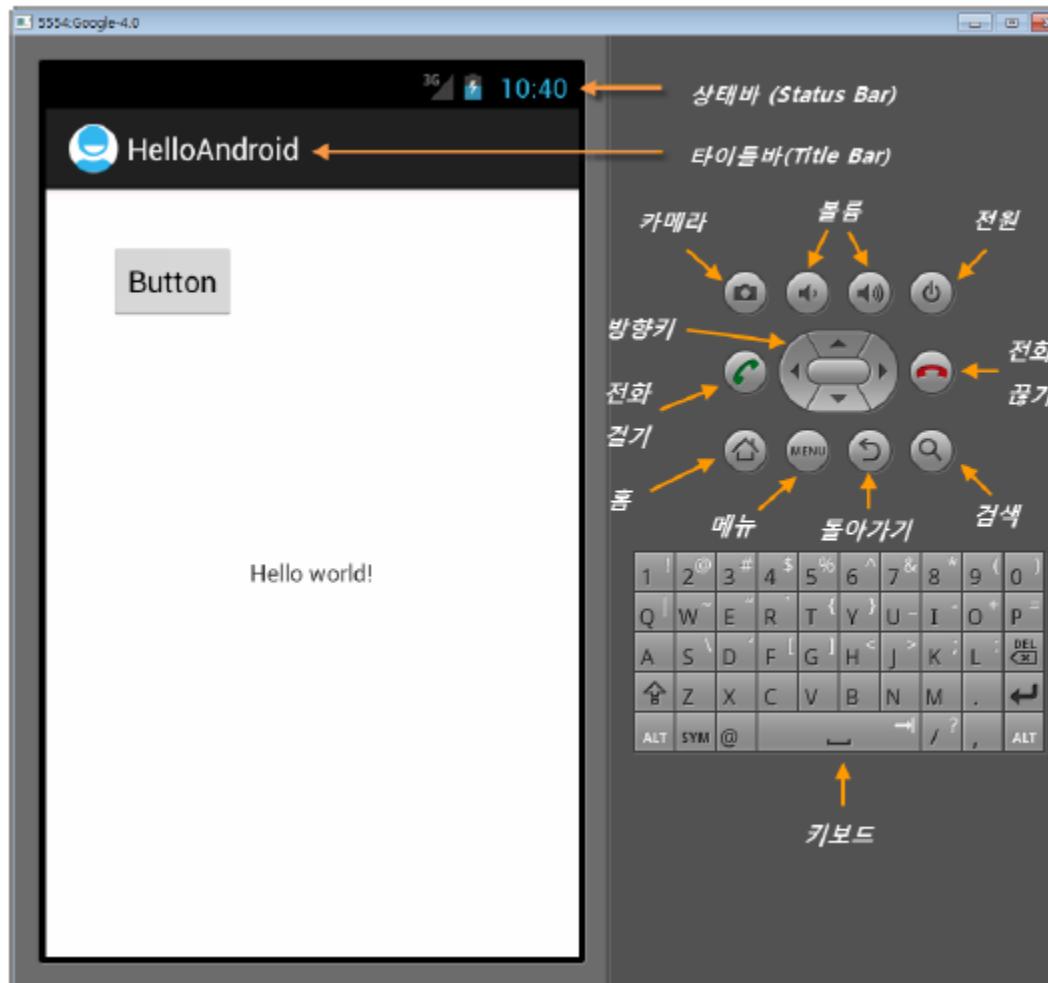
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.administrator.s20150001">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="S20150001"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />
                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

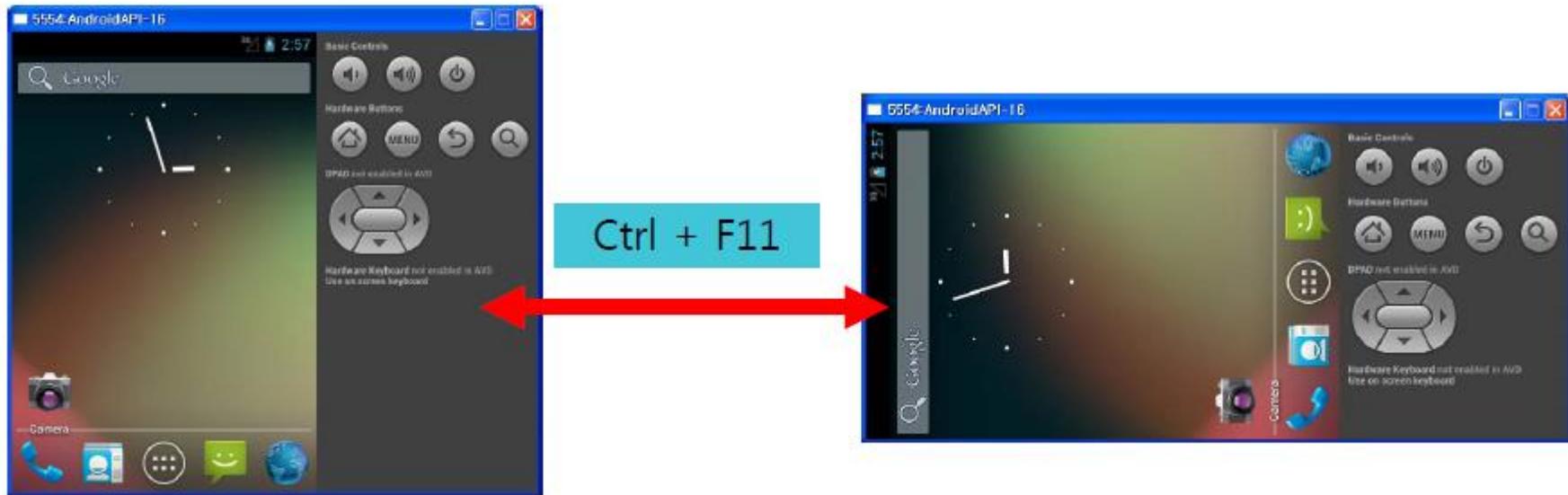
</manifest>
```

앱 아이콘, 화면 구성 스타일, 액티비티 이름, 등 정보

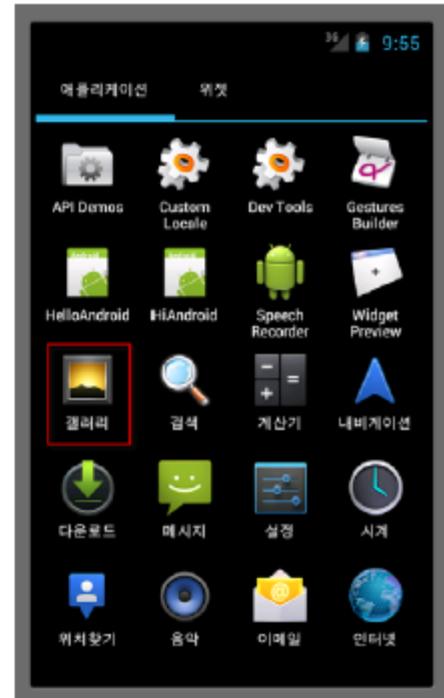
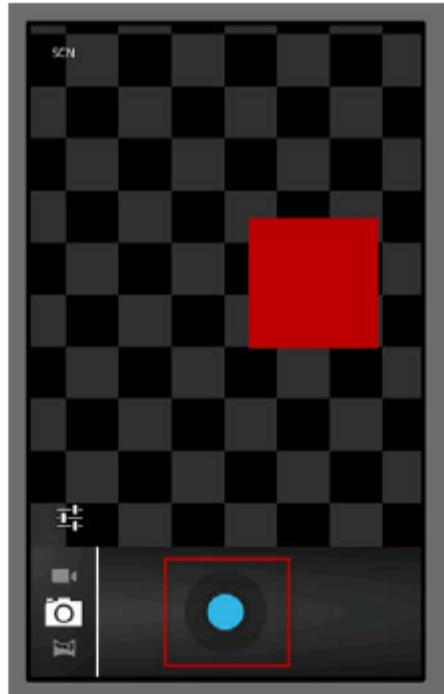
AVD 명칭과 사용법



초기 화면과 가로 화면



알람 추가 / 가상 카메라 / 갤러리



가상의 카메라 화면

웹 브라우저



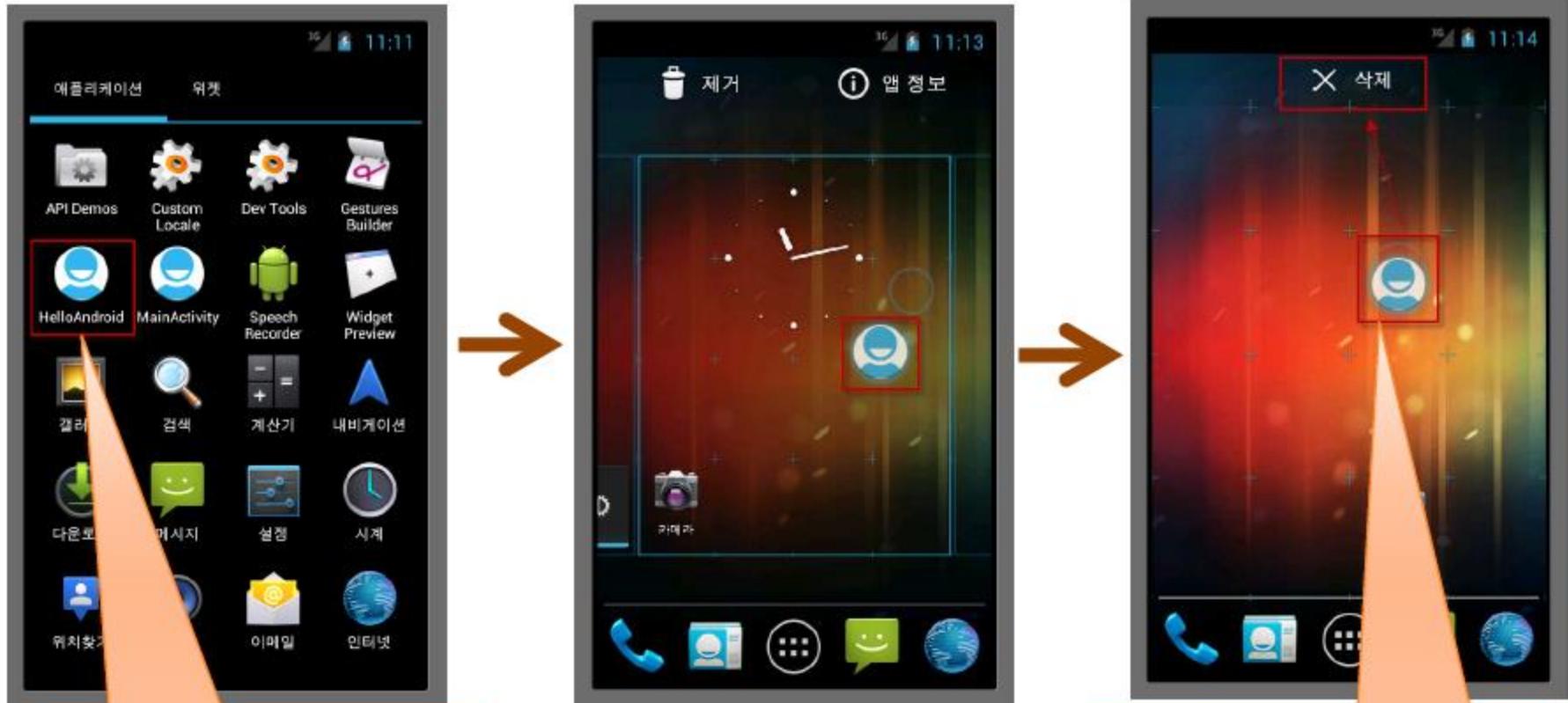
배경화면 변경



디스플레이 설정 변경



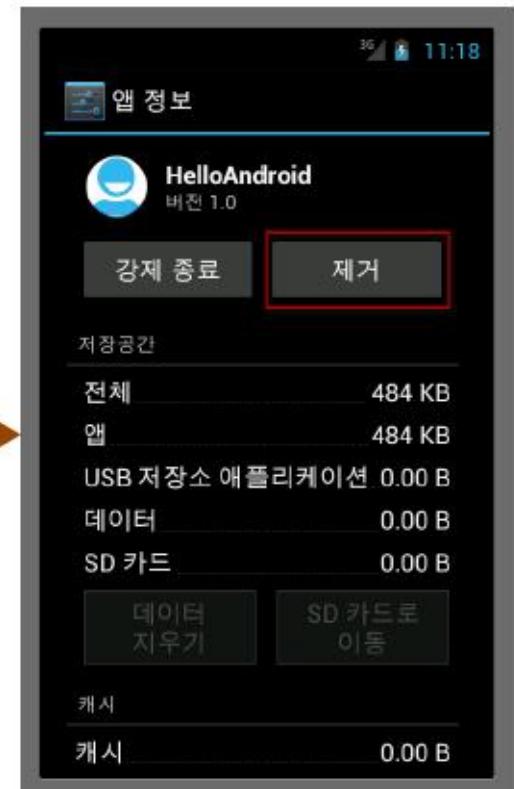
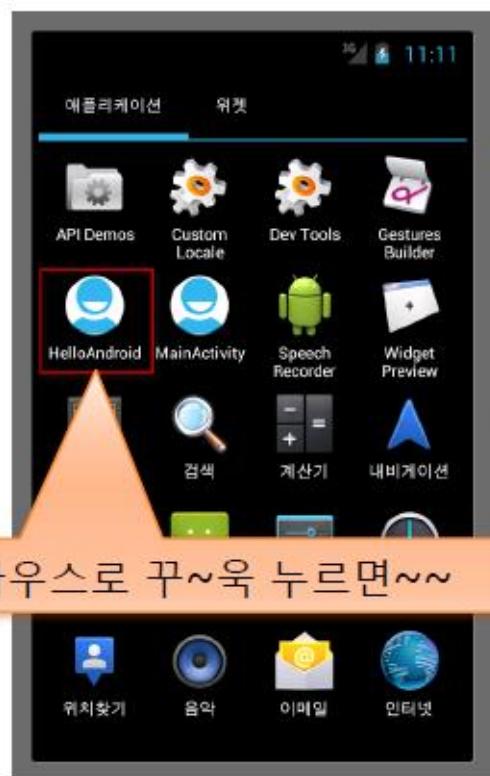
❖ 바탕화면에 응용 프로그램 복사 및 삭제



아이콘을 누르고 있다.

아이콘을 누르고 있다.

응용 프로그램 완전 삭제



>MainActivity.java

```
package com.example.administrator.s20150001;

import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

1. 삭제

>MainActivity.java

```
package com.example.administrator.s20150001;

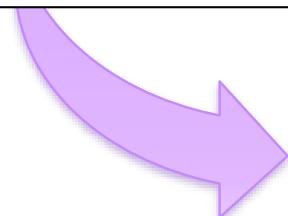
public class MainActivity extends AppCompatActivity {

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

```
MainActivity.java x
package com.example.administrator.s20150001;

public class MainActivity extends AppCompatActivity {
```

2. 클릭 후 [Alt] + [Enter]



```
MainActivity.java x
package com.example.administrator.s20150001;

public class MainActivity extends AppCompatActivity {
```

3. 클릭

- Import class
- Create class 'AppCompatActivity'
- Create Test
- Create subclass
- Make package-local

```
C MainActivity.java x
package com.example.administrator.s20150001;

import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

4. 추가 확인

```
C MainActivity.java x
package com.example.administrator.s20150001;

import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

    @Override
    ? android.os.Bundle? Alt+Enter
    ... protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

5. 클릭 후 [Alt] + [Enter]

Import

```

>MainActivity.java x

package com.example.administrator.s20150001;

import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

```

6. 클릭

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- Import class**
- Create class 'Bundle'
- Create enum 'Bundle'
- Create inner class 'Bundle'
- Create interface 'Bundle'
- Create field for parameter 'savedInstanceState'
- Insert App Indexing API Code
- Define params default value
- Generate delegated method with default parameter value
- Make 'private'
- Make 'public'
- Make package-local

```

>MainActivity.java x

package com.example.administrator.s20150001;

import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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    protected void onCreate(Bundle savedInstanceState) {
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7. 추가 확인

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    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
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    }
}
```

1. 오른쪽 마우스 클릭

2. 클릭

Show Line Numbers

Show Indent Guides

Use Soft Wraps

Annotate

MainActivity.java

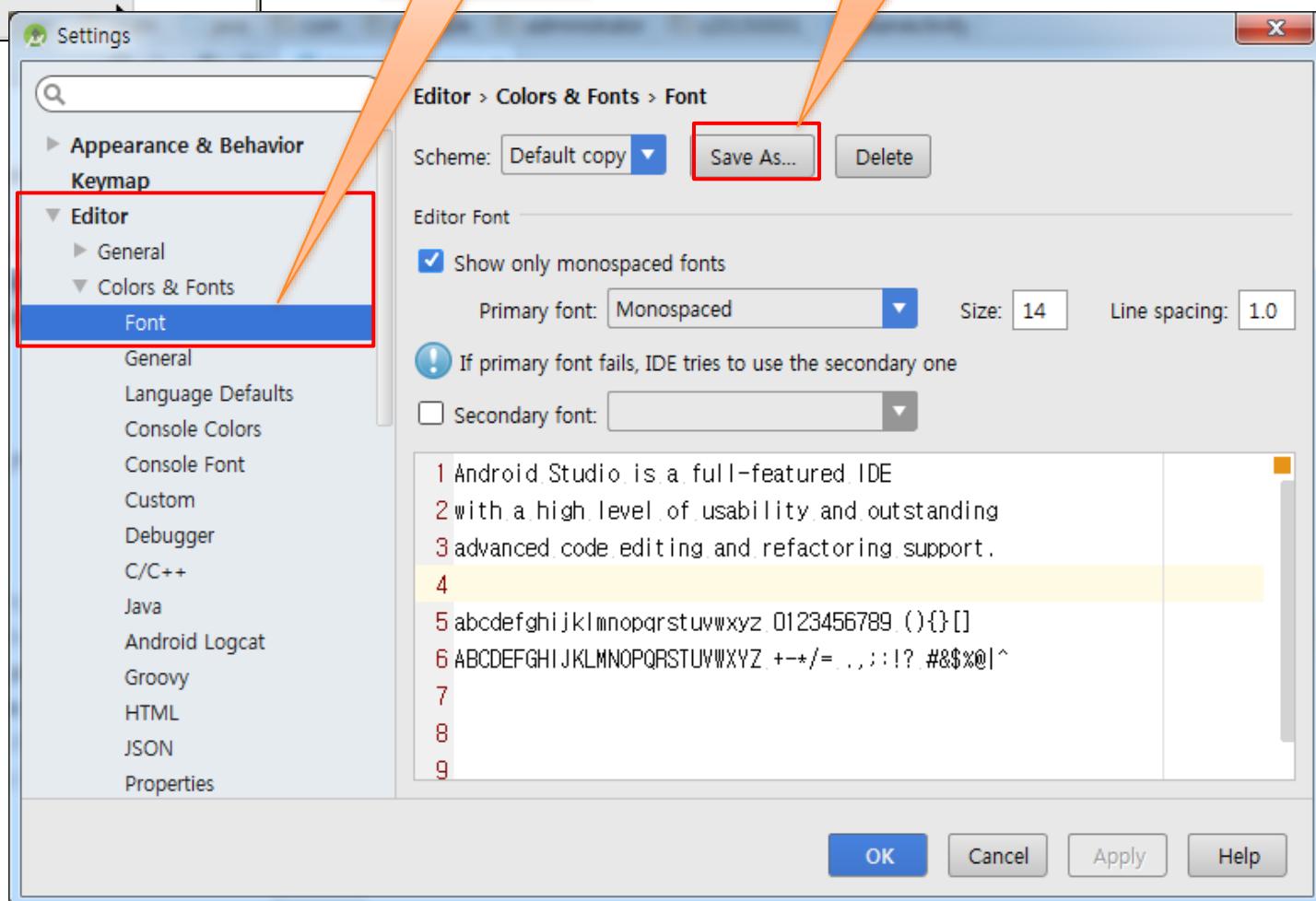
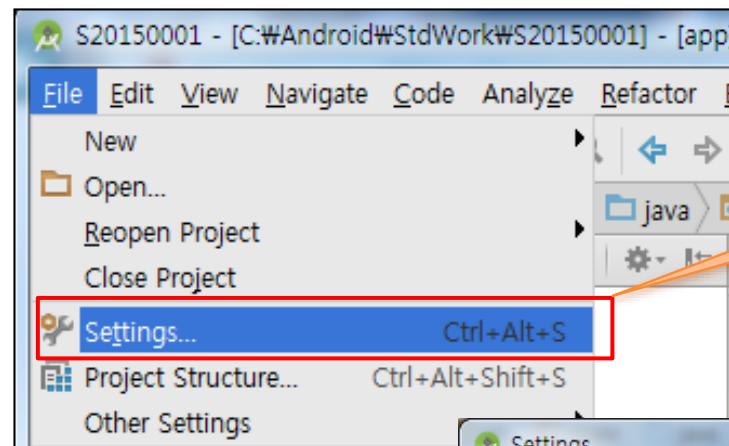
```
1
2
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6
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9
10
11
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14
```

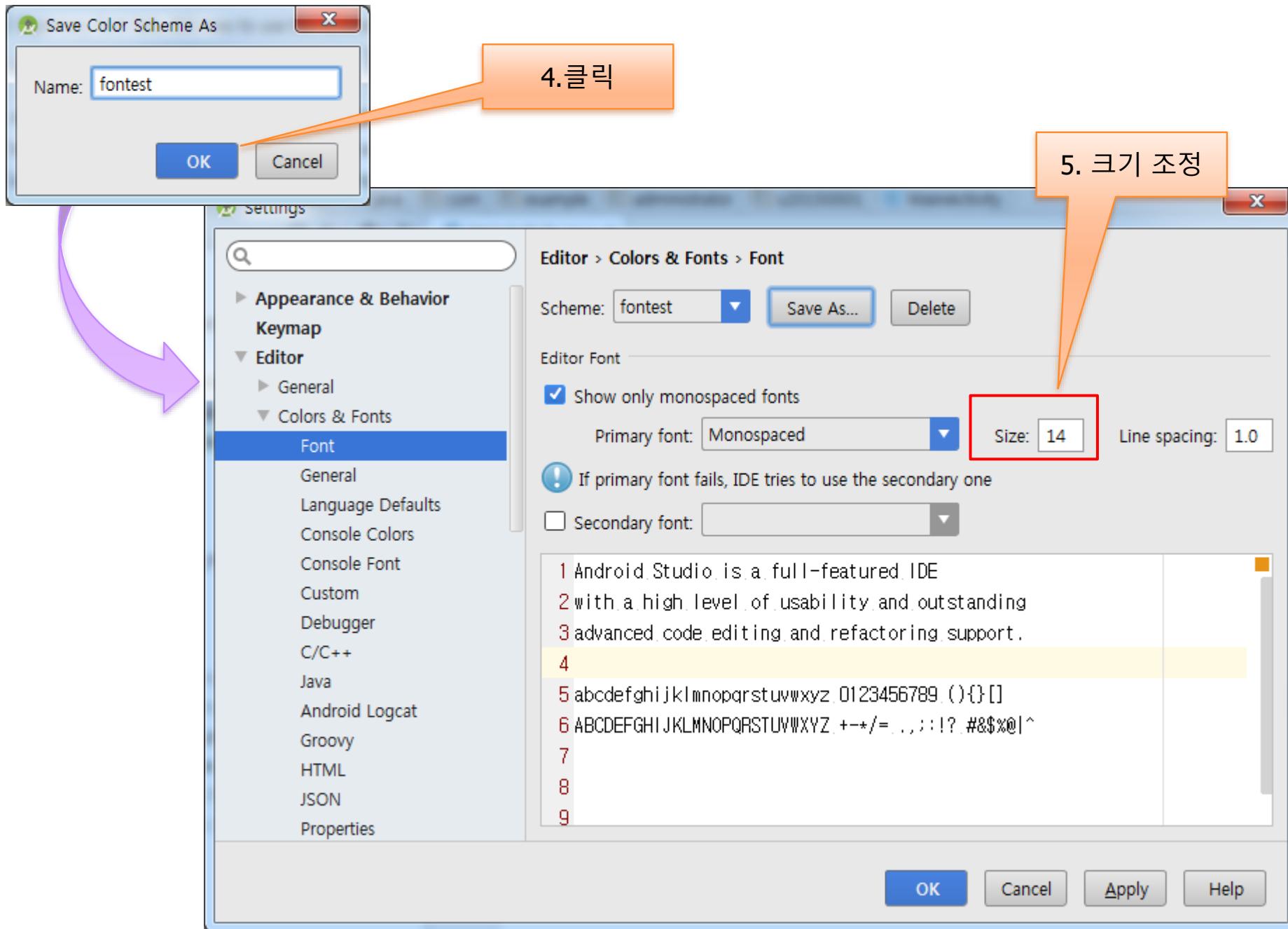
```
package com.example.a

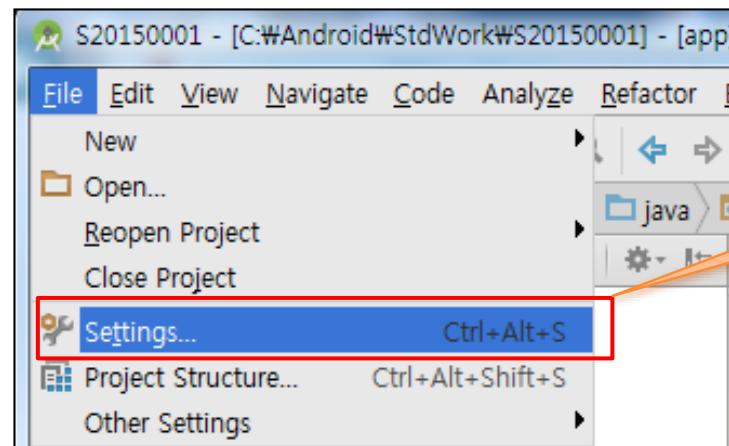
import android.os.Bund
import android.support

public class MainActi

@Override
protected void onCrea
super.onCreate(savedInsta
setContentView
```



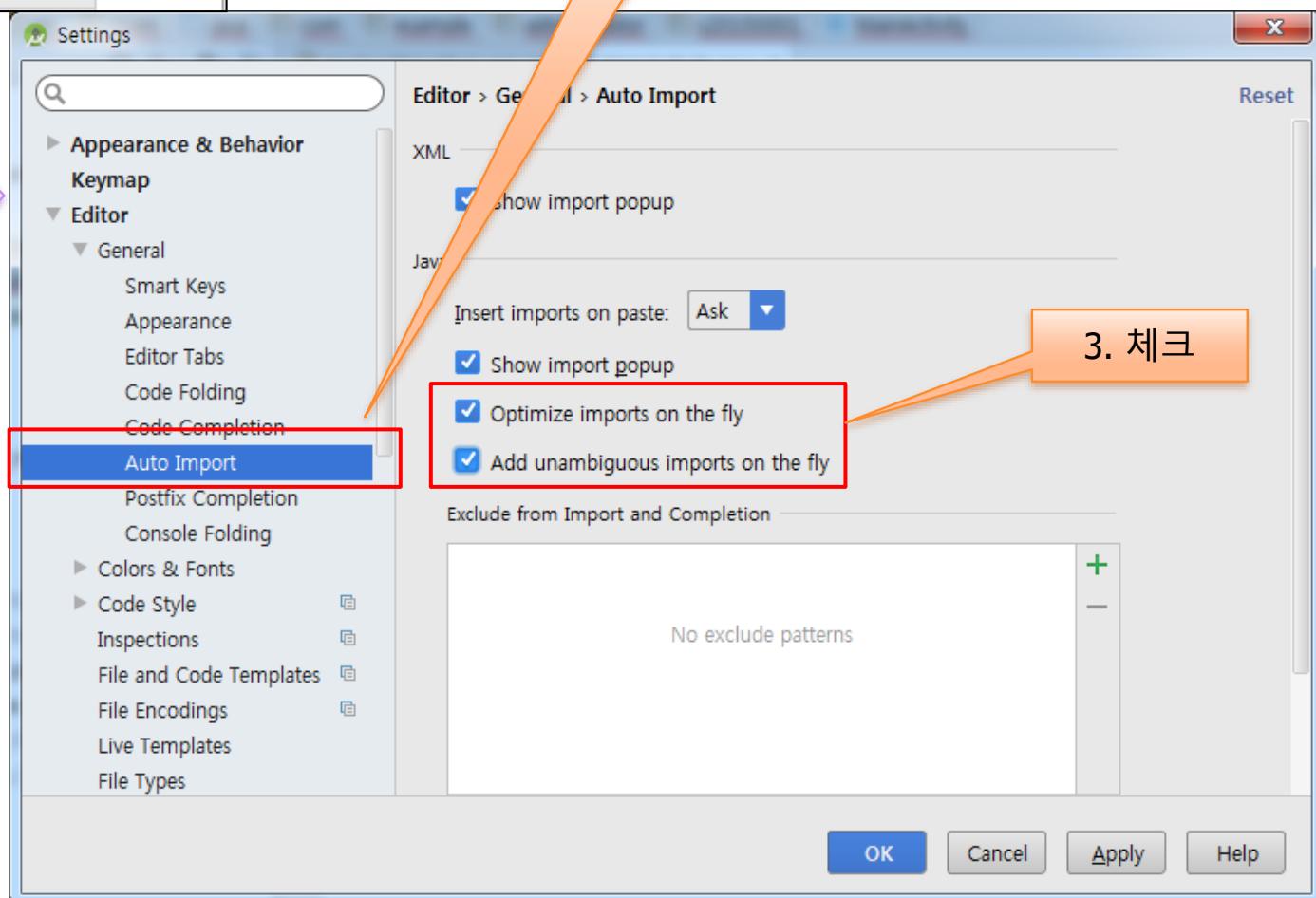




1. 클릭

2. 클릭

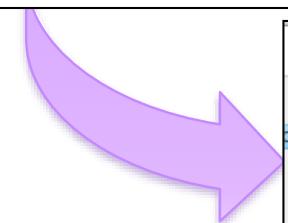
3. 체크



```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="16dp"
    android:paddingLeft="16dp"
    android:paddingRight="16dp"
    android:paddingTop="16dp"
    tools:context="com.example.administrator.s20150001.MainActivity">

    <TextView      android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!" />
</RelativeLayout>
```

[CRTL] + [ALT] + L



```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
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    android:paddingBottom="16dp"
    android:paddingLeft="16dp"
    android:paddingRight="16dp"
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        android:layout_width="wrap_content"
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