

# 안드로이드 구성



# 구성 내용

2

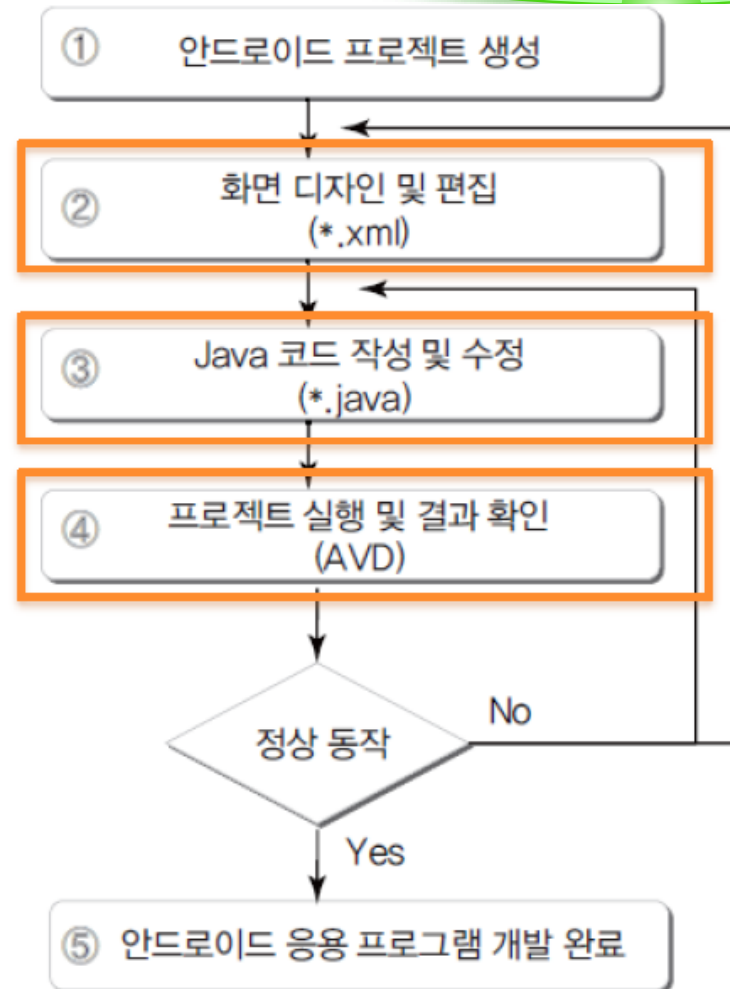
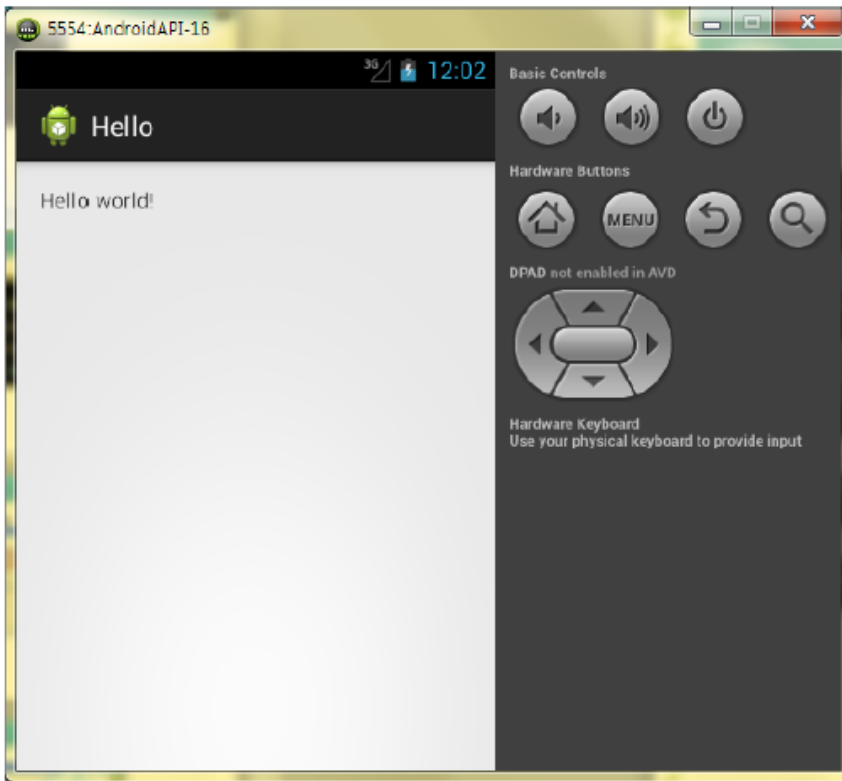


- 프로젝트 만들기
- 자동 생성 소스 분석
- 프로그램 구조 및 사용자 인터페이스
- AVD 명칭과 사용법
- 유용한 기능

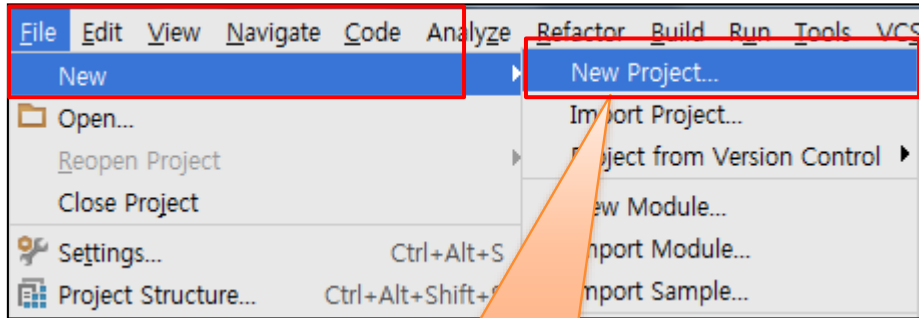


# 프로젝트 만들기

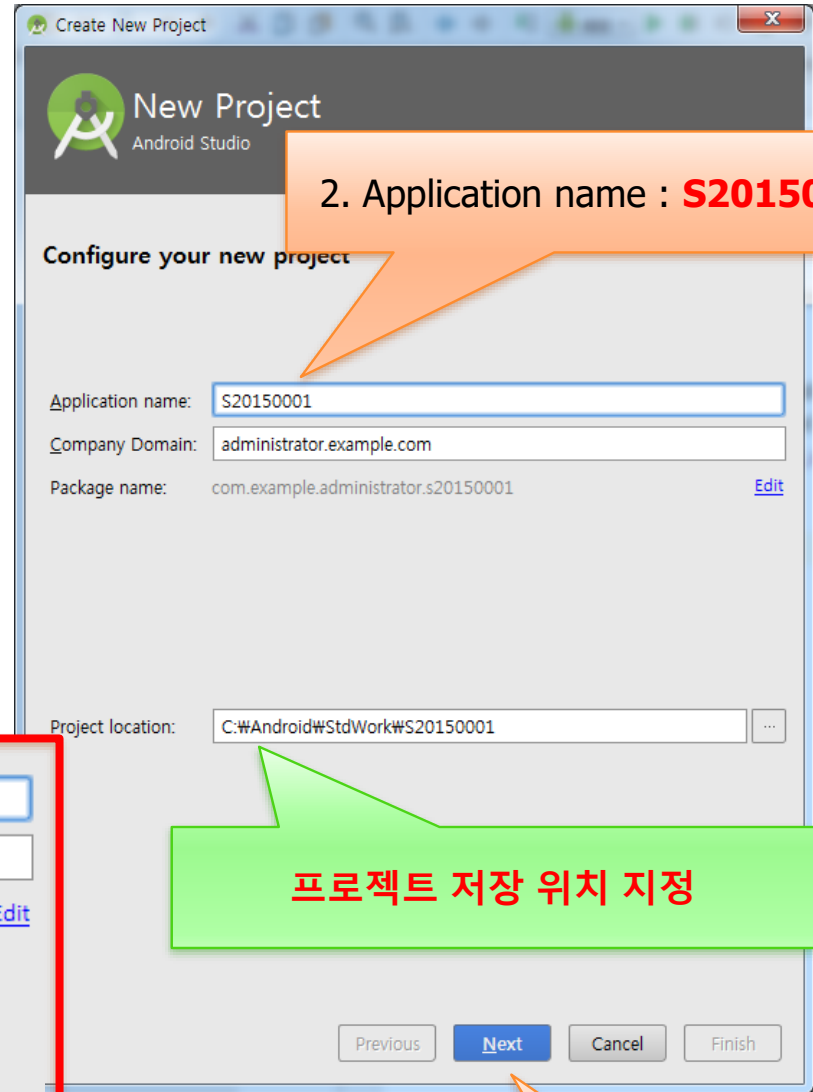
3



[안드로이드 프로젝트 개발 단계]



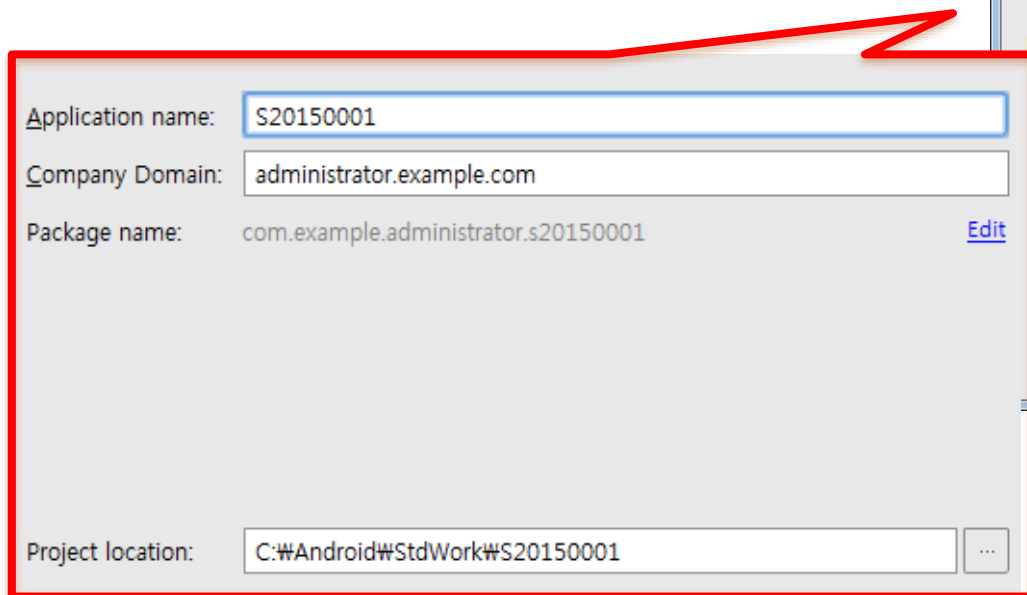
1. [File]→[New]→[New Project...]



2. Application name : **S20150001**


프로젝트 저장 위치 지정

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 타겟 장치의 최소 SDK 버전

Create New Project



## Target Android Devices

Select the form factors your app will run on

Different platforms may require separate SDKs

☒ Phone and Tablet
 

Minimum SDK
 

API 15: Android 4.0.3 (IceCreamSandwich)

Lower API levels target more devices, but have fewer features available.  
By targeting API 15 and later, your app will run on approximately 97.3% of the devices that are active on the Google Play Store.  
[Help me choose](#)

☐ Wear
 

Minimum SDK
 

API 21: Android 5.0 (Lollipop)

☐ TV
 

Minimum SDK
 

API 21: Android 5.0 (Lollipop)

☐ Android Auto

☐ Glass
 

Minimum SDK
 

N: Android N (Preview)

Looking for SDKs available for download...

Previous

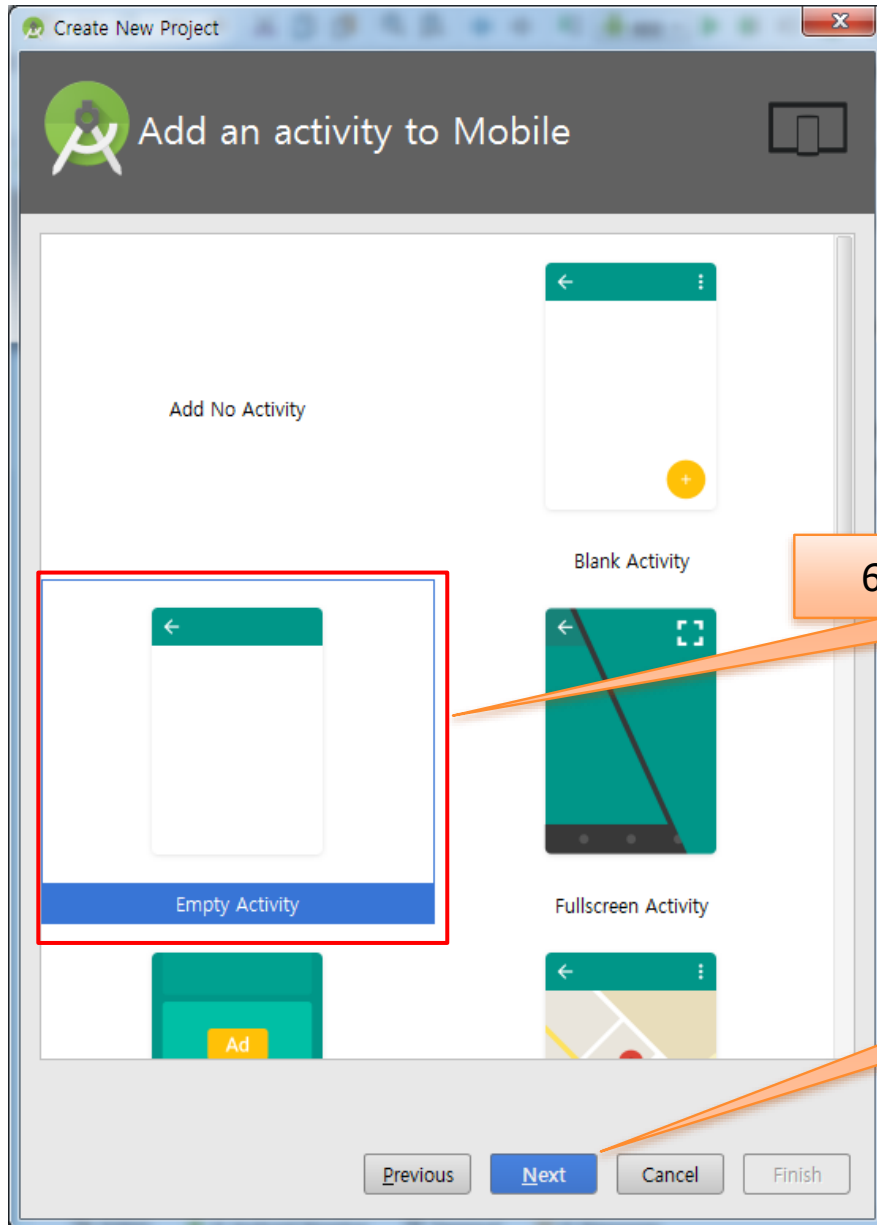
Next

Cancel

Finish

4. 개발한 앱이 작동될 안드로이드  
최소 버전 지정

5. 클릭

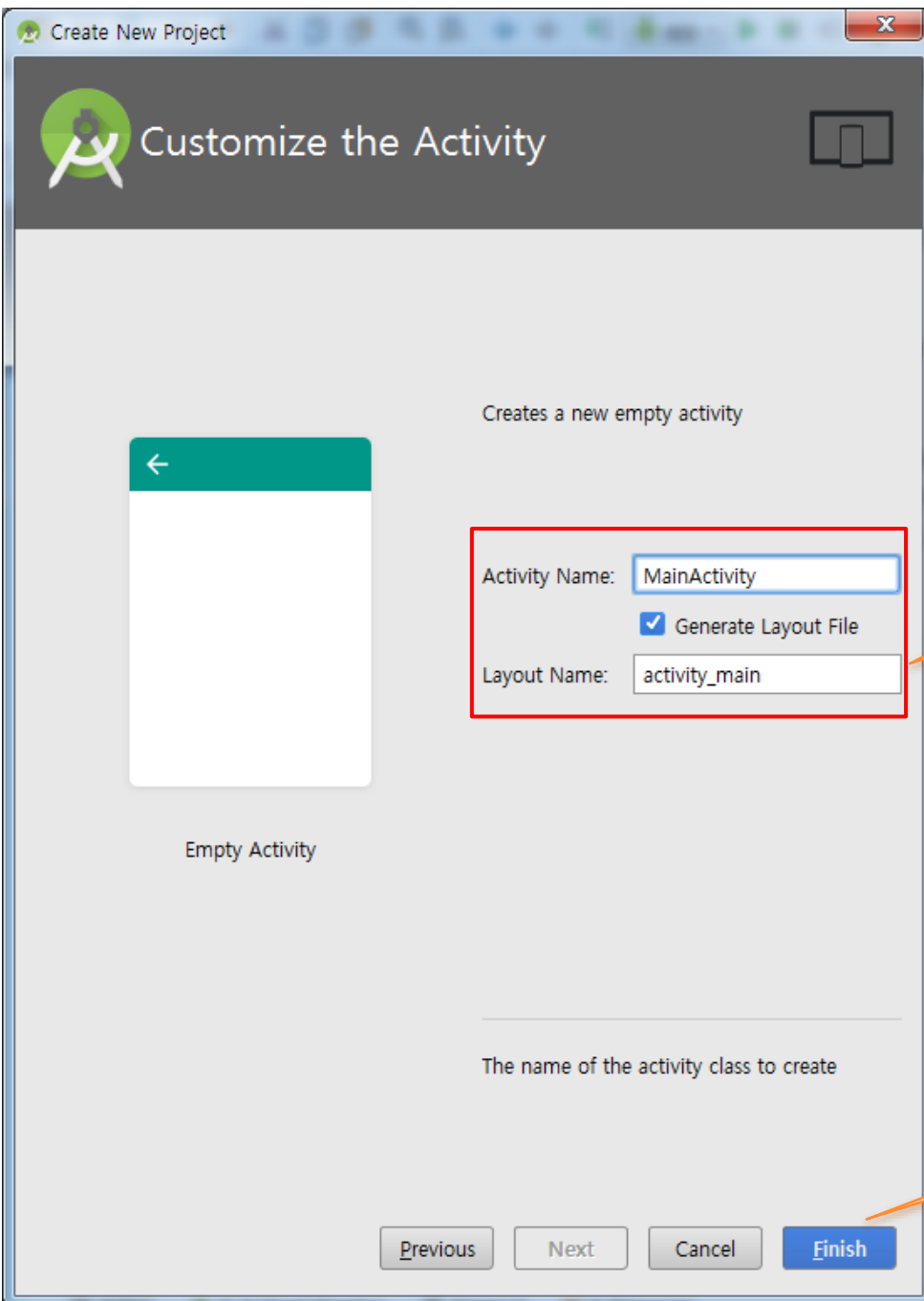


## 8. 파일명 지정

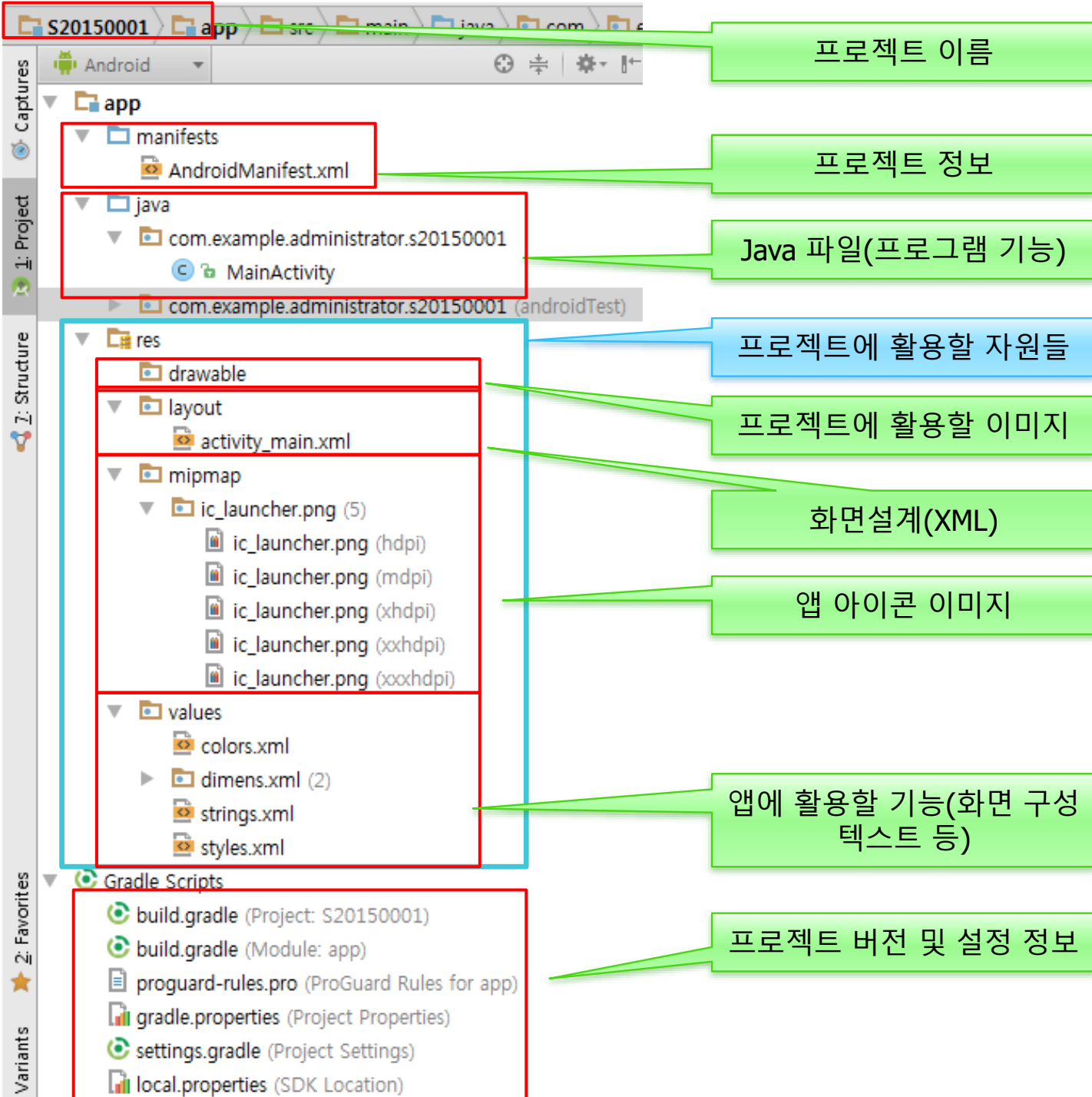
Activity Name : MainActivity

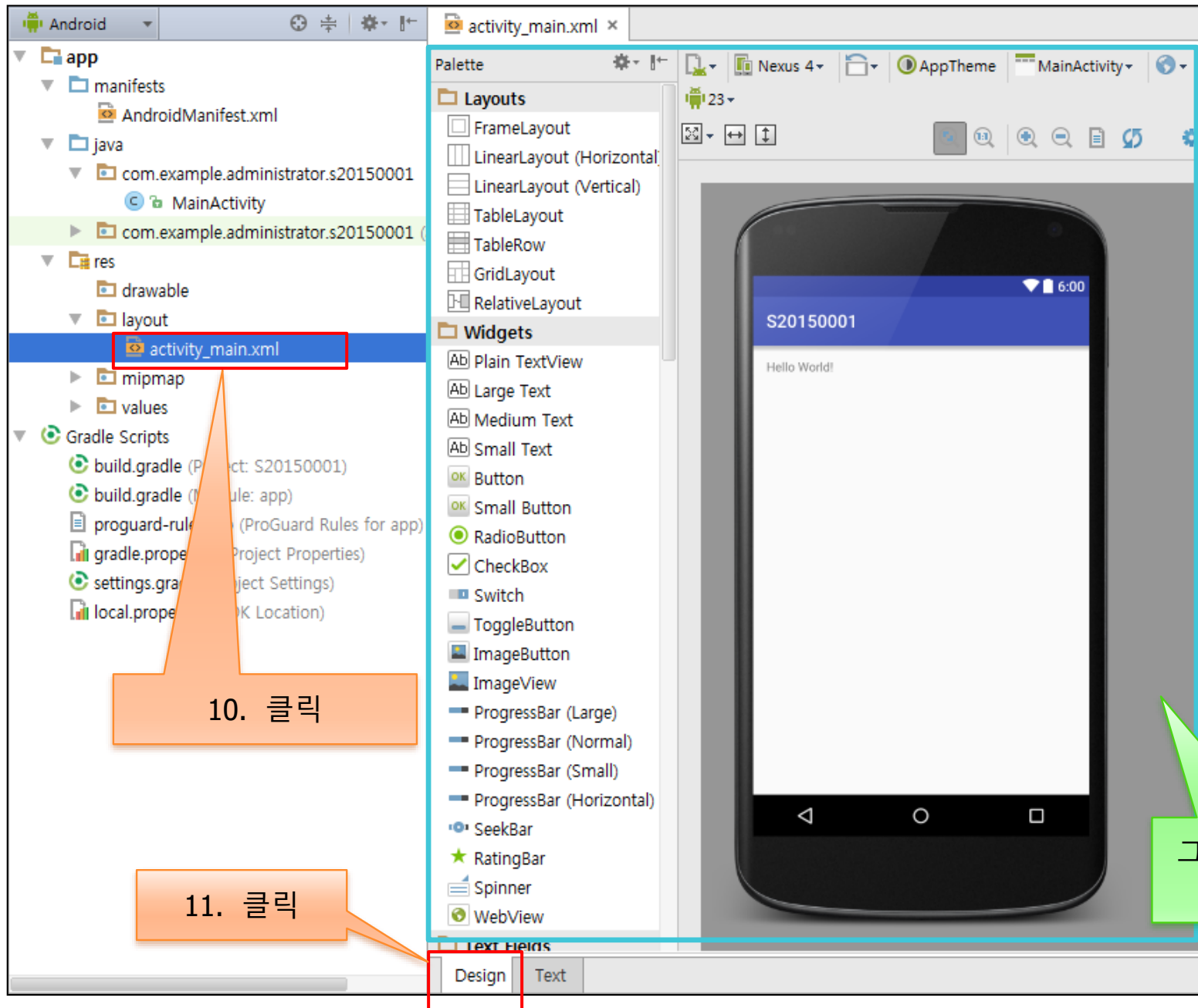
Layout Name : activity\_main

## 9. 클릭





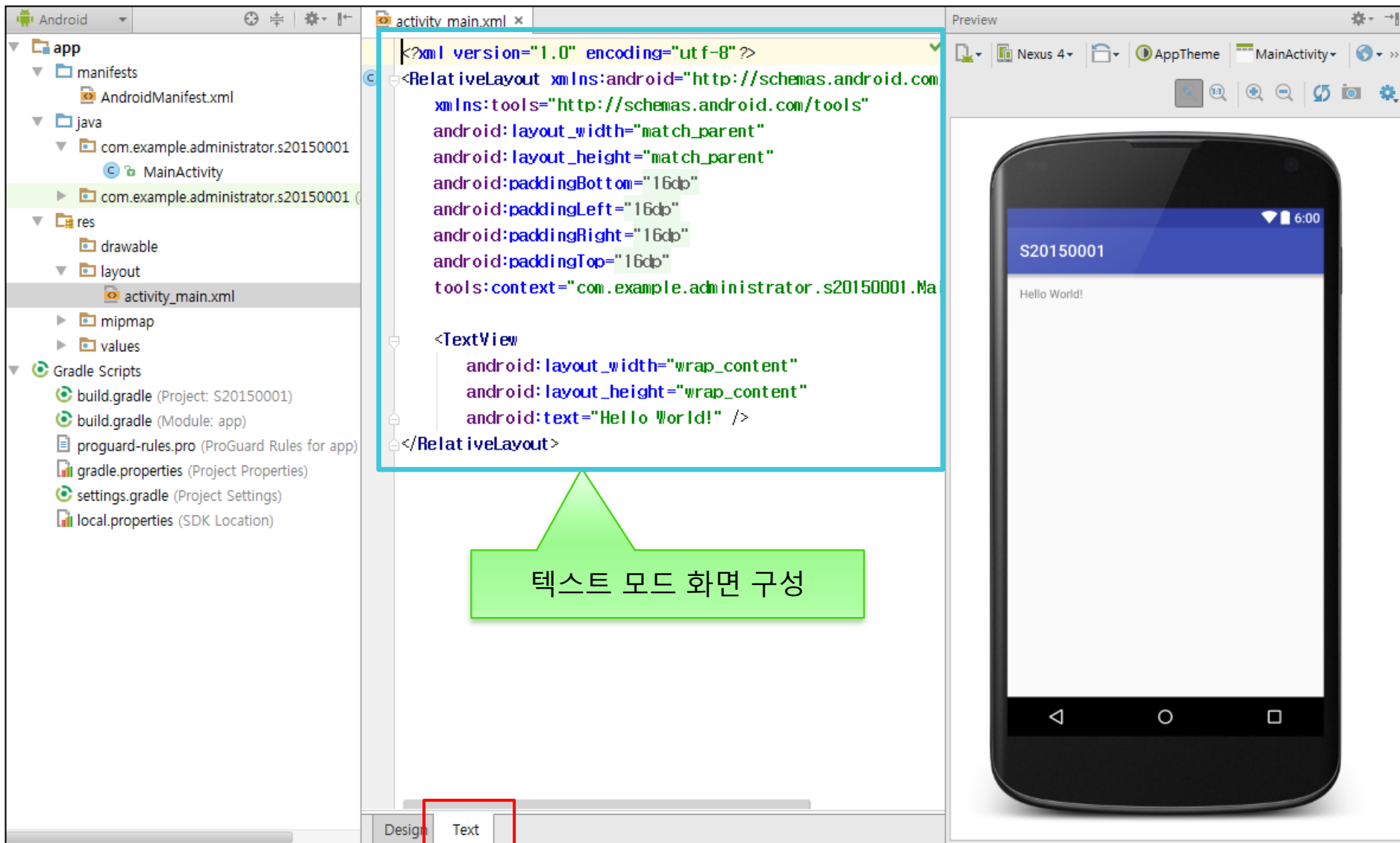




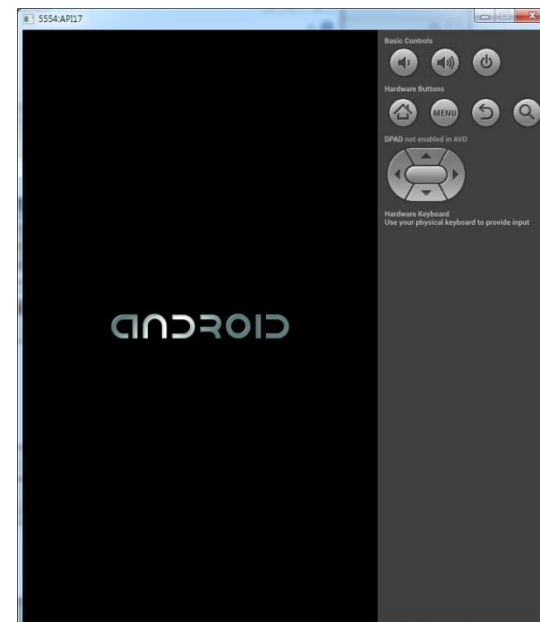
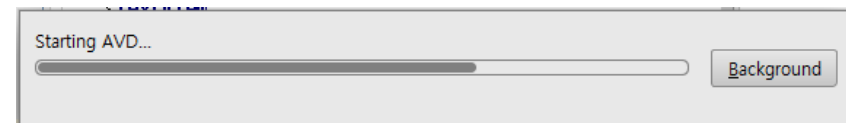
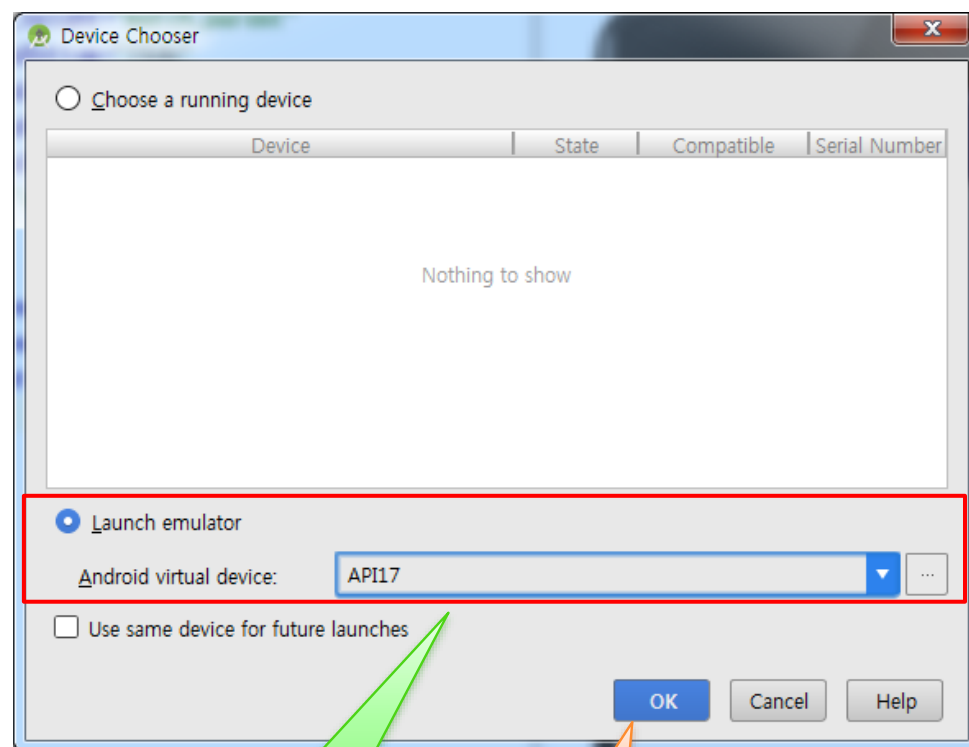
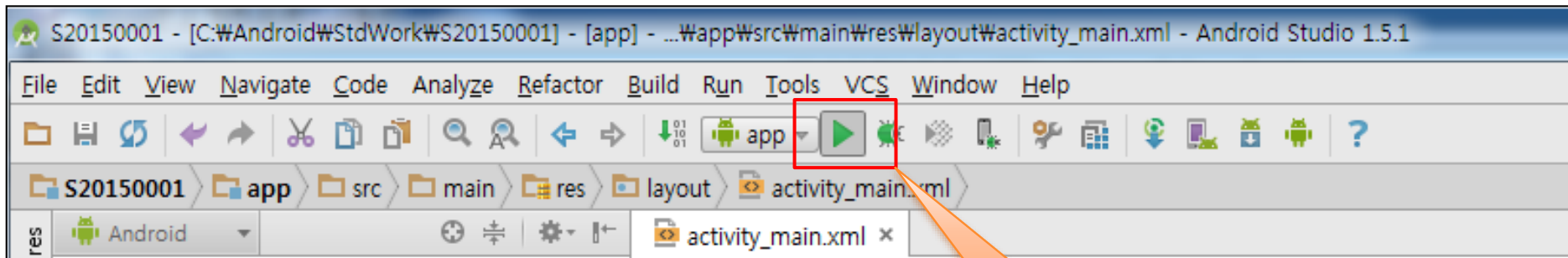
10. 클릭

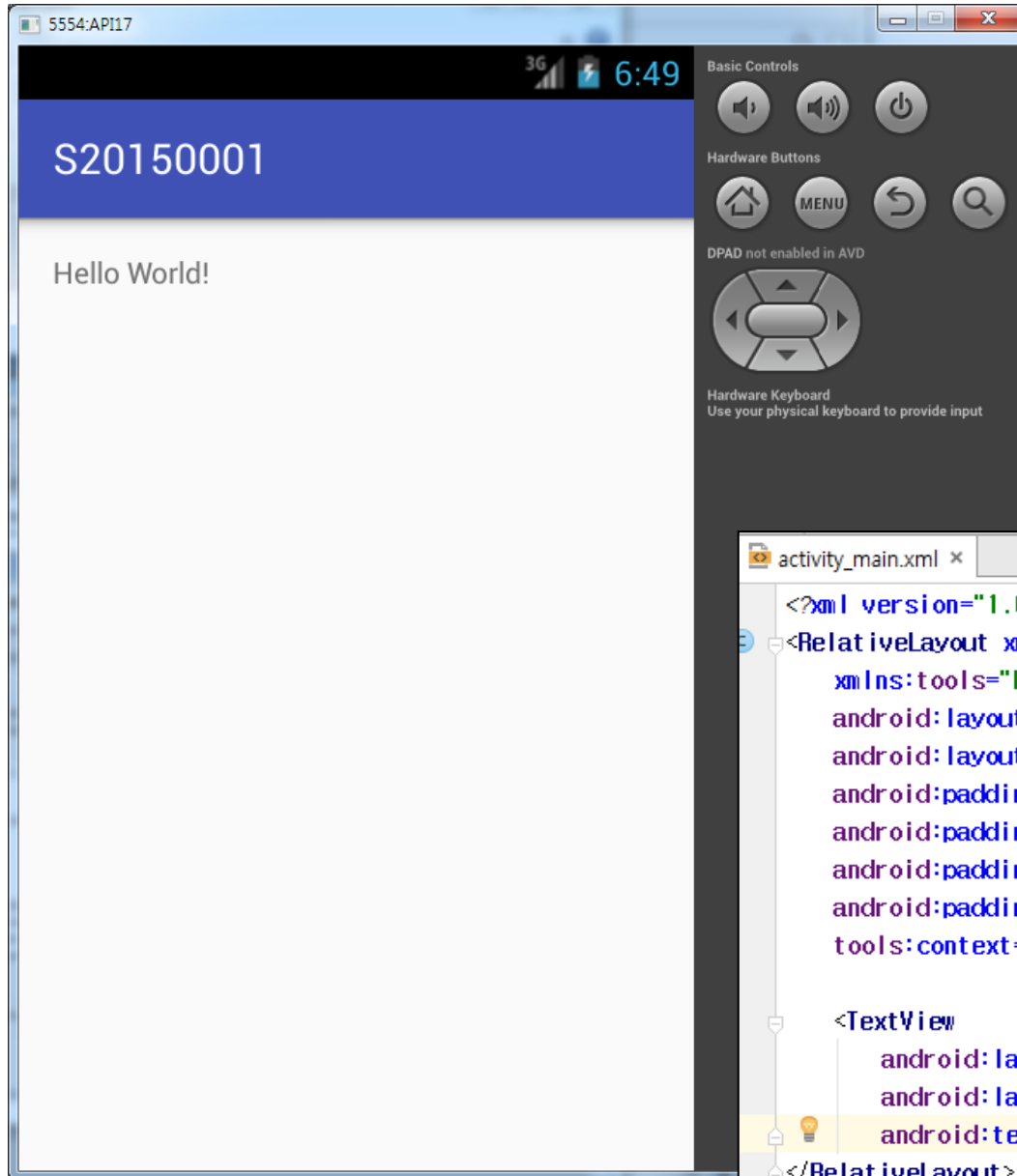
11. 클릭

그래픽 모드 화면  
구성



12. 클릭

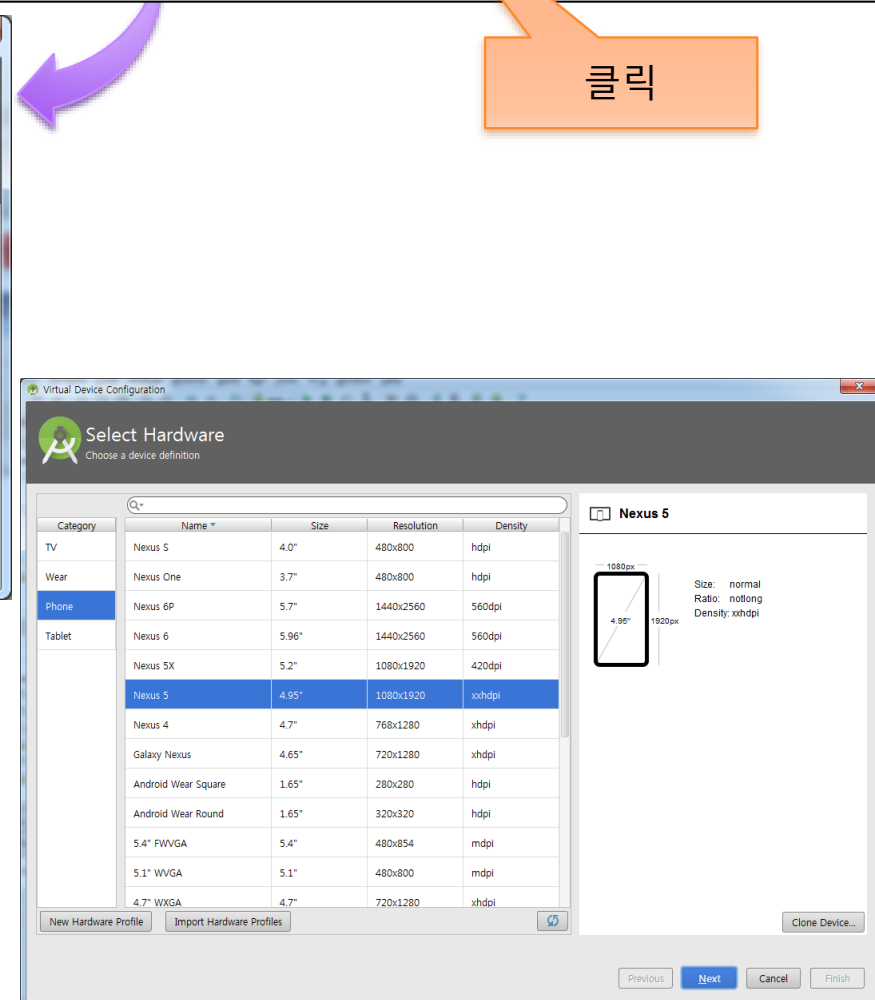
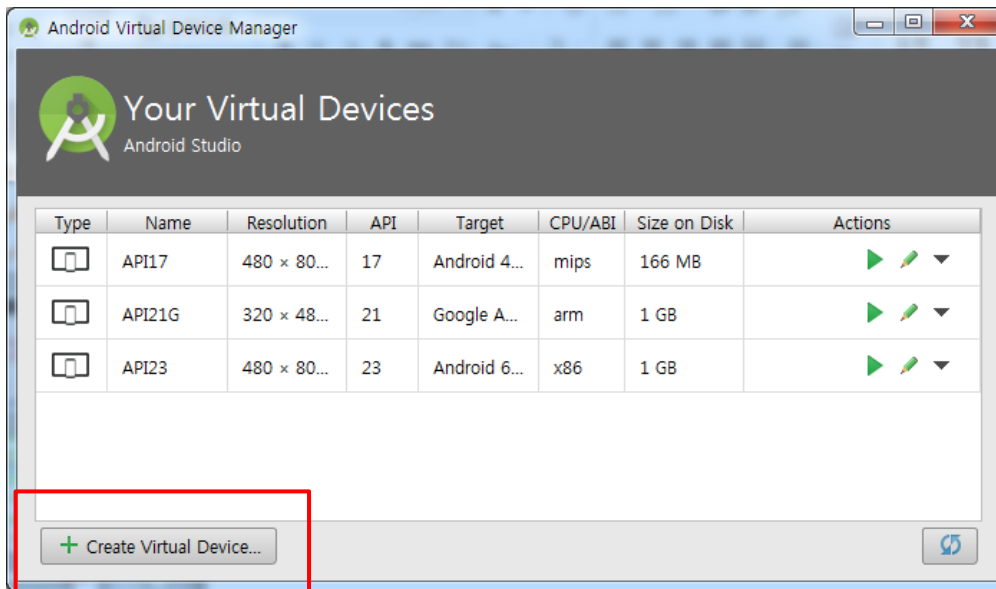
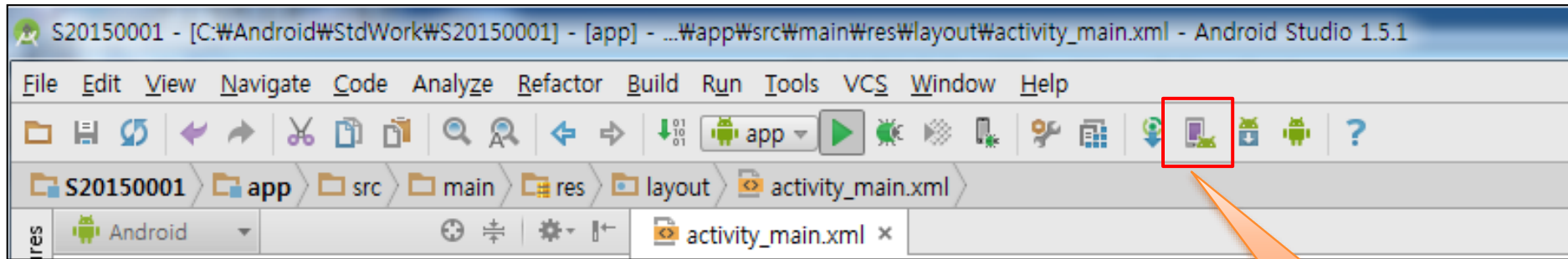


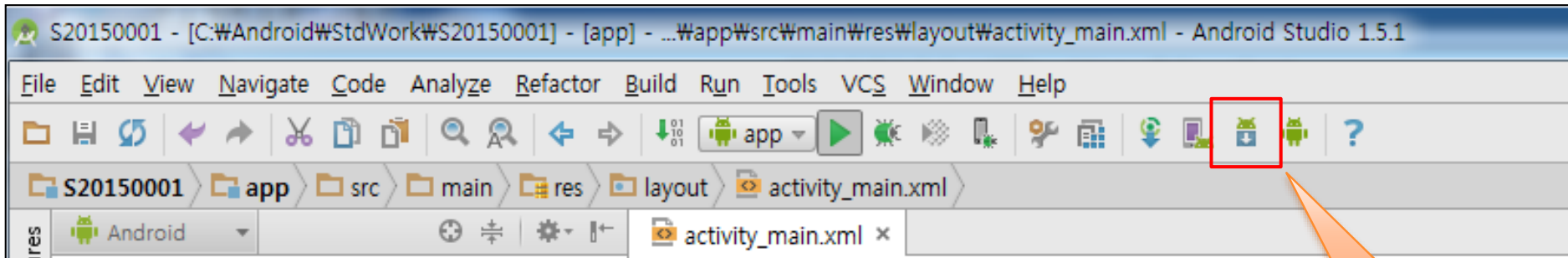


```
activity_main.xml x
<?xml version="1.0" encoding="utf-8" ?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    android:paddingBottom="16dp"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

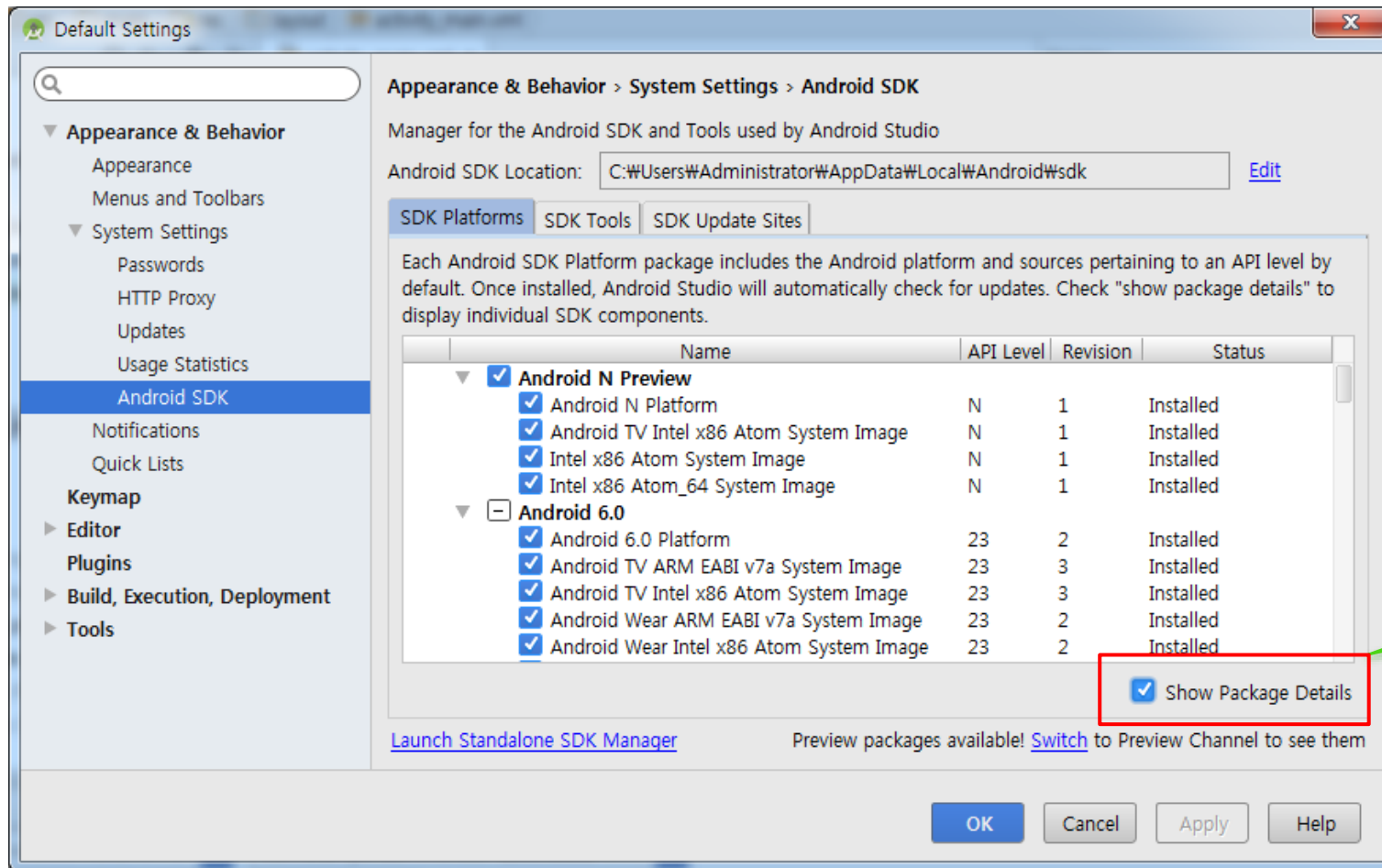
    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!" />

</RelativeLayout>
```

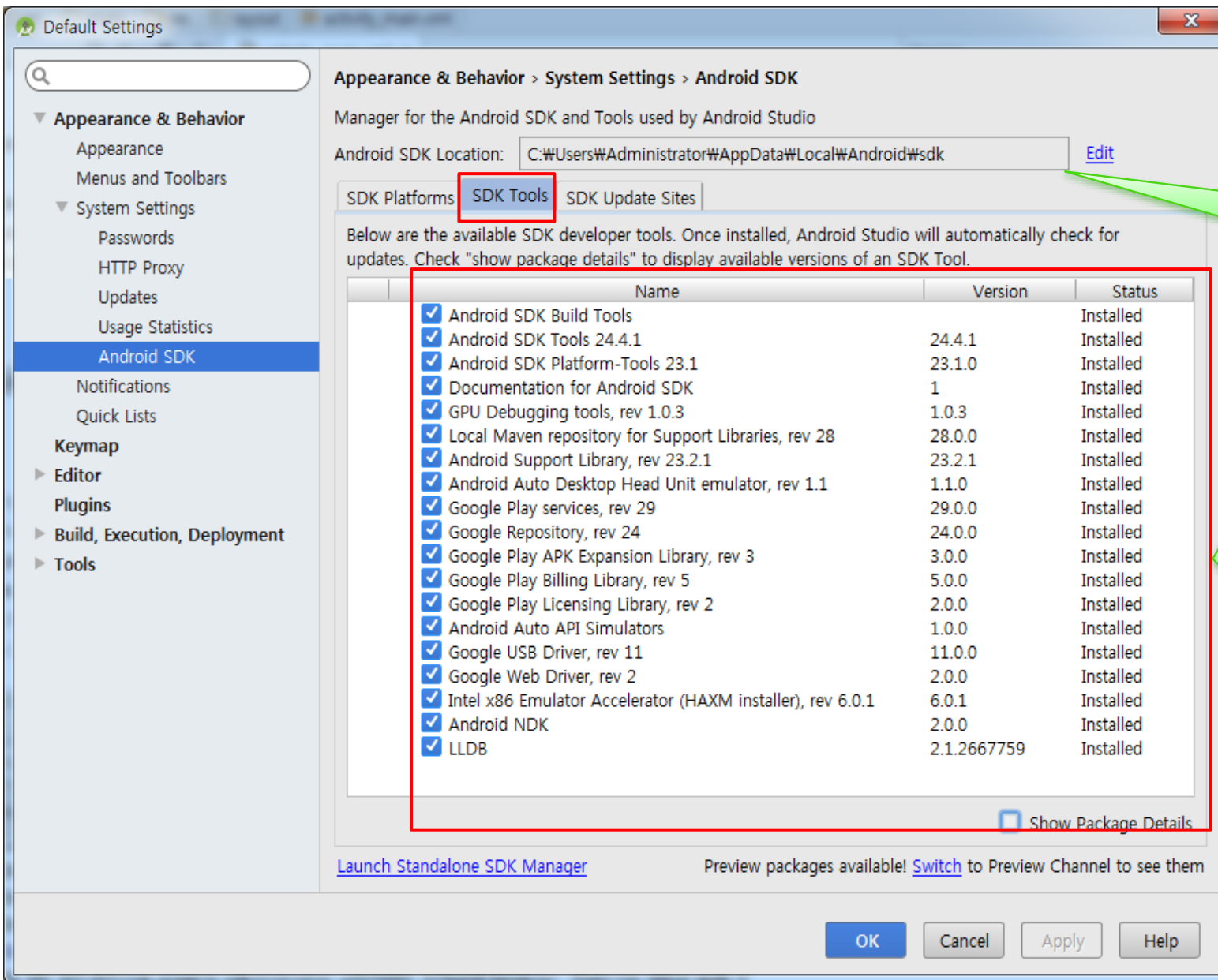




클릭



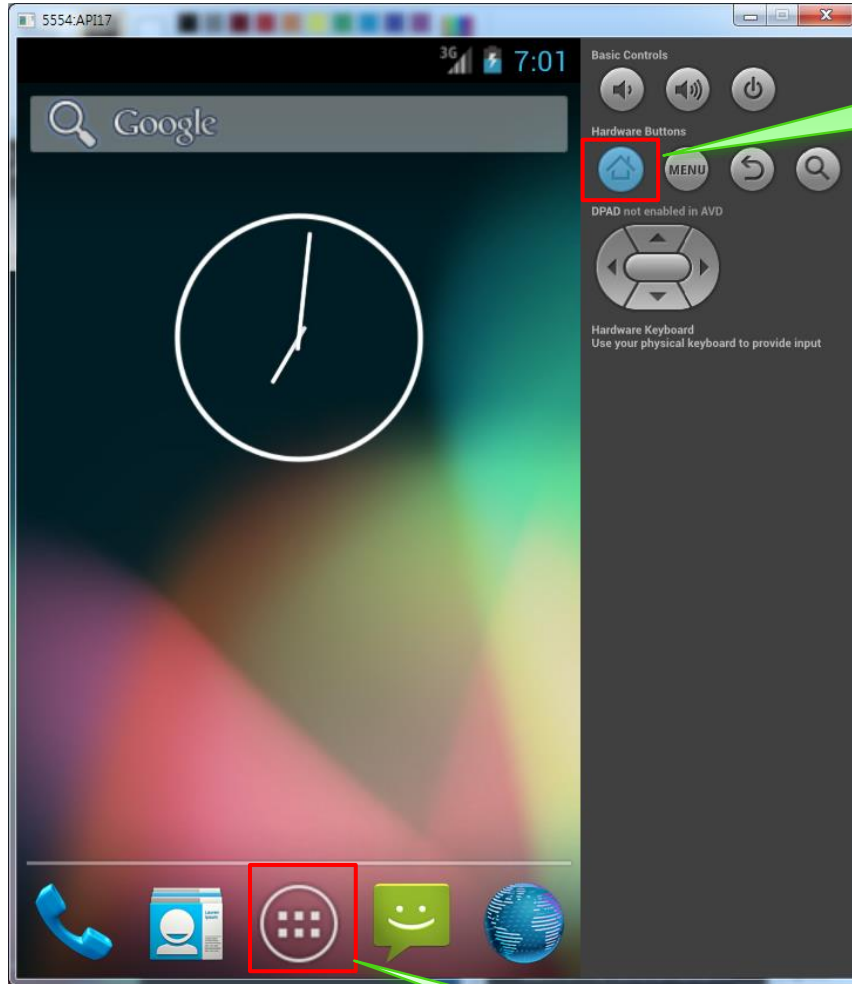
상세하게 보기



안드로이드 SDK  
저장위치

안드로이드 프로  
그래밍 및 SDK  
운영에 필요한  
유틸리티





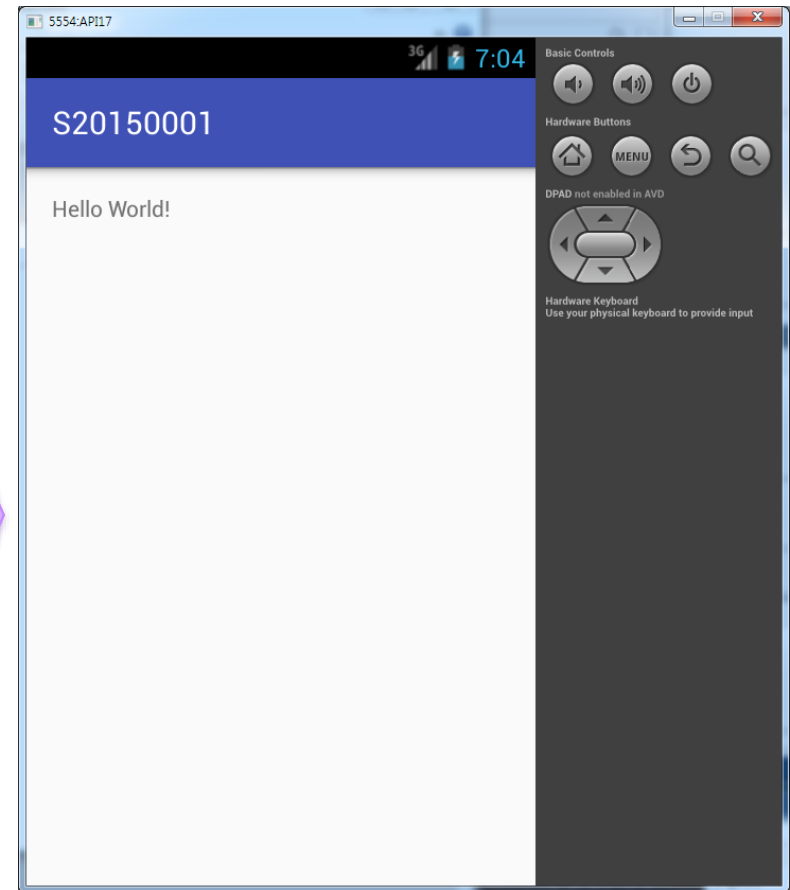
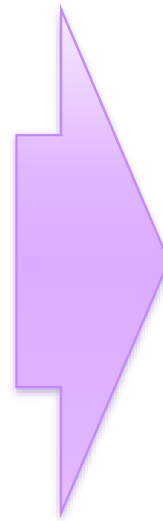
홈 화면

메뉴



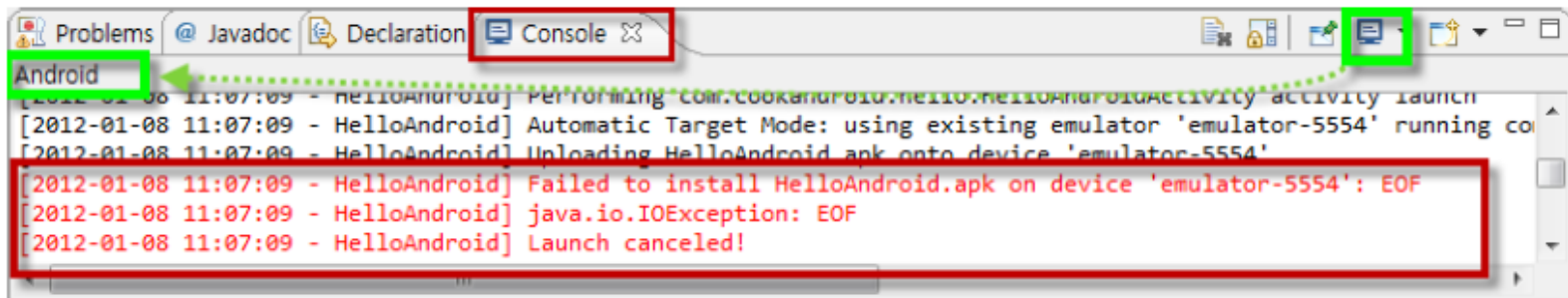


클릭하여 실행



# Tip. 오류처리

## (참고) 프로젝트가 AVD를 인식하지 않을 때 조치법



```
Android
[2012-01-08 11:07:09 - HelloAndroid] Performing com.cookandroid.hello.helloandroid.activity launch
[2012-01-08 11:07:09 - HelloAndroid] Automatic Target Mode: using existing emulator 'emulator-5554' running co
[2012-01-08 11:07:09 - HelloAndroid] Uploading HelloAndroid.apk onto device 'emulator-5554'
[2012-01-08 11:07:09 - HelloAndroid] Failed to install HelloAndroid.apk on device 'emulator-5554': EOF
[2012-01-08 11:07:09 - HelloAndroid] java.io.IOException: EOF
[2012-01-08 11:07:09 - HelloAndroid] Launch canceled!
```

- 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



2. 패키지 명

3. Import

1. 클릭

The screenshot shows the Android Studio IDE with the following structure:

- Left Sidebar (Project Structure):**
  - app
    - manifests
      - AndroidManifest.xml
    - java
      - com.example.administrator.s20150001
        - MainActivity** (selected)
    - res
      - drawable
      - layout
        - activity\_main.xml
      - mipmap
      - values
    - Gradle Scripts
- Main Editor (MainActivity.java):**

```
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);
    }
}
```

import 문장은 외부에서 패키지나 클래스를 포함

4. 화면 연결



# 안드로이드 리퍼런스



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

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

The screenshot displays the Android Developer website's reference page for the `Activity` class. The browser's address bar shows the URL `http://developer.android.com/reference/android/app/Activity.html`. The page features a navigation bar with tabs for Training, API Guides, Reference (selected), Tools, and Google Services. On the left, a sidebar lists various Android APIs, with `android.app` and `Activity` highlighted. The main content area shows the class `Activity` extending `ContextThemeWrapper` and implementing several interfaces. It also lists known direct and indirect subclasses. The 'Class Overview' section provides a brief description of the `Activity` class.



# 자동코드 분석

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



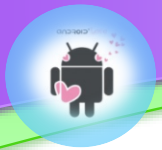
액티비티는 화면을 통하여 사용자와 상호작용하는 활동을 의미한다.

```
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
- @Override은 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.





## ○ 사용자 인터페이스 기술

### ○ 사용자 인터페이스 작성 방법

- ⊙ 코드를 사용하는 방법(기존의 자바)
- ⊙ XML을 사용하는 방법(안드로이드 선호 방법)

### ○ 안드로이드에서는 UI 화면의 구성을 XML을 이용하여 선언적으로 나타내는 방법을 선호

- ⊙ 애플리케이션의 외관과 애플리케이션의 Logic을 서로 분리
- ⊙ 빠르게 UI를 구축





## 일반적인 애플리케이션 작성 절차

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

화면 설계

기능 설계

필요에 따라  
작동 환경 설계





## 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);  
}
```





Android Studio interface showing the project structure and the `activity_main.xml` file.

**Project Structure (Left Panel):**

- app
  - android.support.v7.appcompat
    - R
  - com.example.administrator.s20150001
    - test
      - ApplicationTest
      - BuildConfig
      - MainActivity
      - R** (highlighted)
      - drawable
      - layout
      - mipmap-hdpi
      - mipmap-mdpi
      - mipmap-xhdpi
      - mipmap-xxhdpi
      - mipmap-xxxhdpi
      - values
      - values-w820dp
      - Libraries

**Files under the build folder are generated and should not be edited.**

**Search:** activity\_ma (1 match)

**Code (activity\_main.xml):**

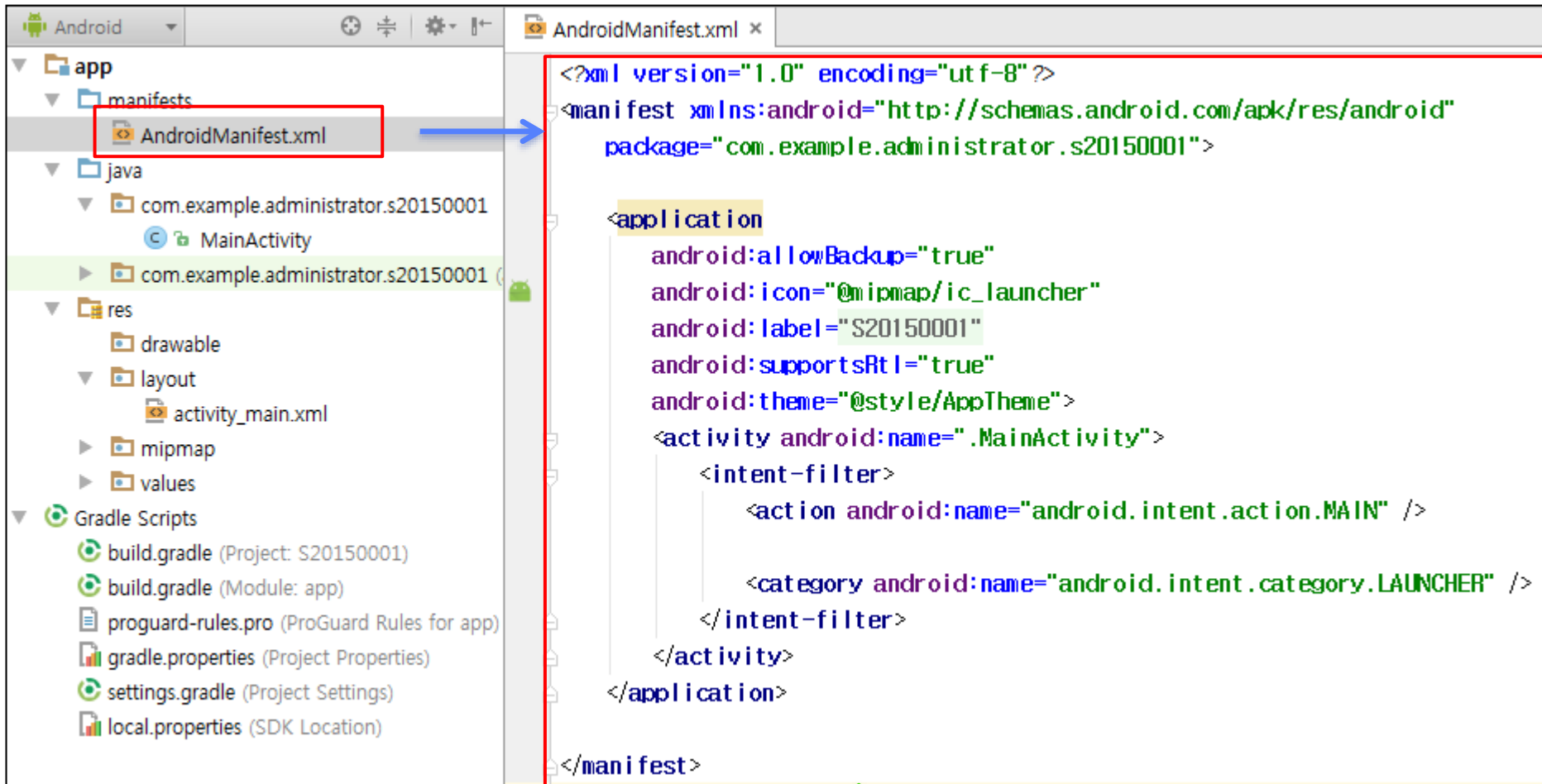
```
public static final int abc_max_action_buttons=0x7f0a0000;
public static final int cancel_button_image_alpha=0x7f0a0003;
public static final int status_bar_notification_info_maxnum=0x7f0a0004;

}

public static final class layout {

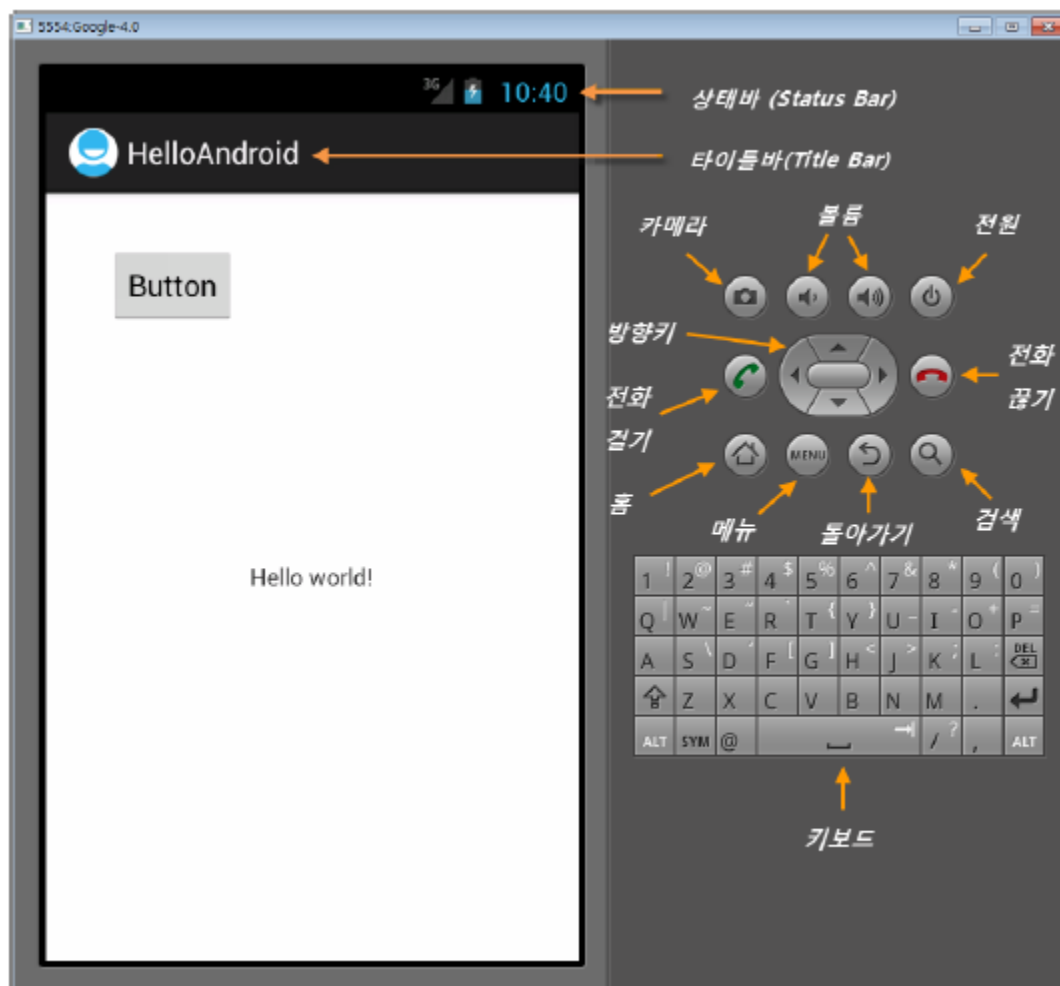
    public static final int abc_action_bar_title_item=0x7f040000;
    public static final int abc_action_bar_up_container=0x7f040001;
    public static final int abc_action_bar_view_list_nav_layout=0x7f040002;
    public static final int abc_action_menu_item_layout=0x7f040003;
    public static final int abc_action_menu_layout=0x7f040004;
    public static final int abc_action_mode_bar=0x7f040005;
    public static final int abc_action_mode_close_item_material=0x7f040006;
    public static final int abc_activity_chooser_view=0x7f040007;
    public static final int abc_activity_chooser_view_list_item=0x7f040008;
    public static final int abc_alert_dialog_button_bar_material=0x7f040009;
    public static final int abc_alert_dialog_material=0x7f04000a;
    public static final int abc_dialog_title_material=0x7f04000b;
    public static final int abc_expanded_menu_layout=0x7f04000c;
    public static final int abc_list_menu_item_checkbox=0x7f04000d;
    public static final int abc_list_menu_item_icon=0x7f04000e;
    public static final int abc_list_menu_item_layout=0x7f04000f;
    public static final int abc_list_menu_item_radio=0x7f040010;
    public static final int abc_popup_menu_item_layout=0x7f040011;
    public static final int abc_screen_content_include=0x7f040012;
    public static final int abc_screen_simple=0x7f040013;
    public static final int abc_screen_simple_overlay_action_mode=0x7f040014;
    public static final int abc_screen_toolbar=0x7f040015;
    public static final int abc_search_dropdown_item_icons_2line=0x7f040016;
    public static final int abc_search_view=0x7f040017;
    public static final int abc_select_dialog_material=0x7f040018;
    public static final int activity_main=0x7f040019;
```

**R.layout.activity\_main** (highlighted)



앱 아이콘, 화면 구성 스타일, 액티비티 이름, 등 정보

# AVD 명칭과 사용법



## 초기 화면과 가로 화면

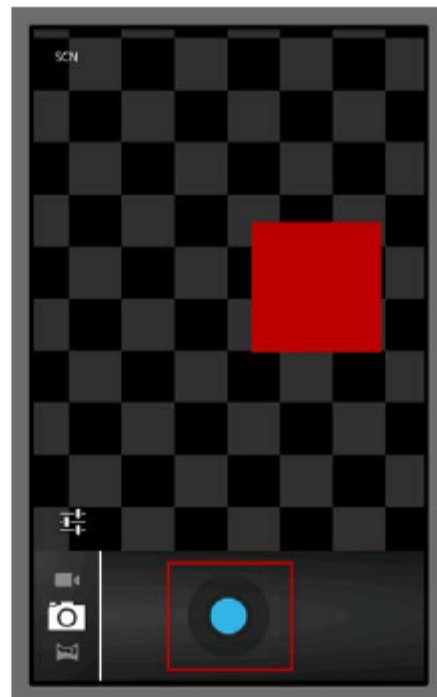
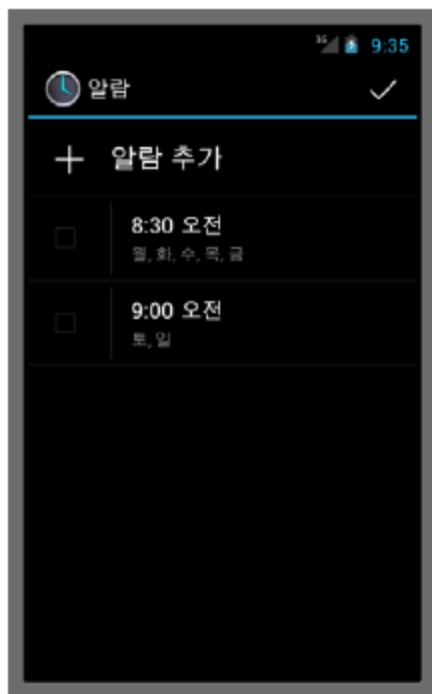


Ctrl + F11





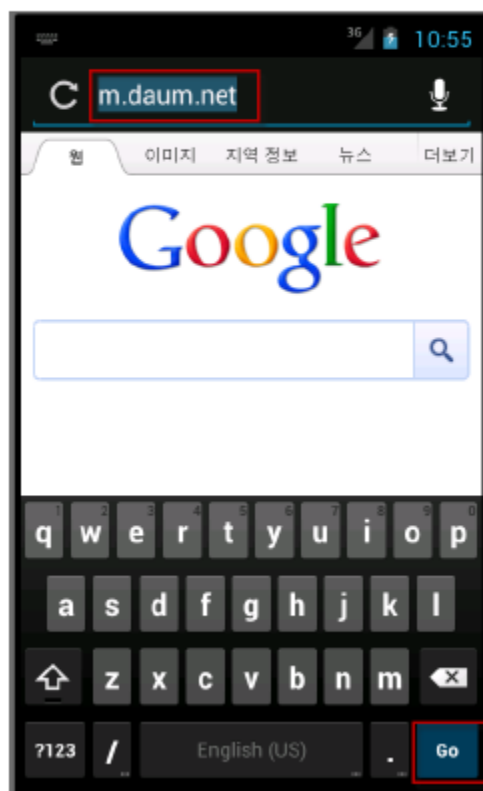
# 알람 추가 / 가상 카메라 / 갤러리



가상의 카메라 화면



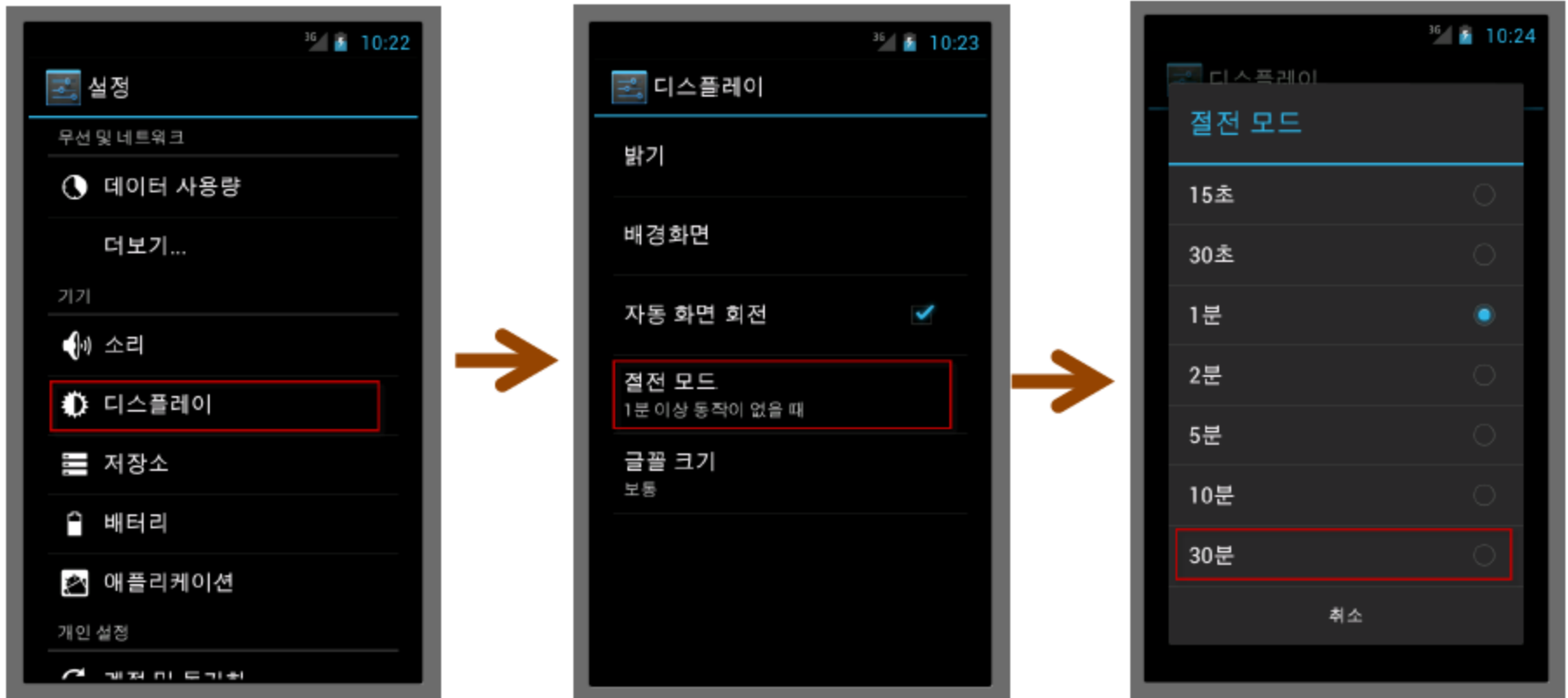
# 웹 브라우저



# 배경화면 변경



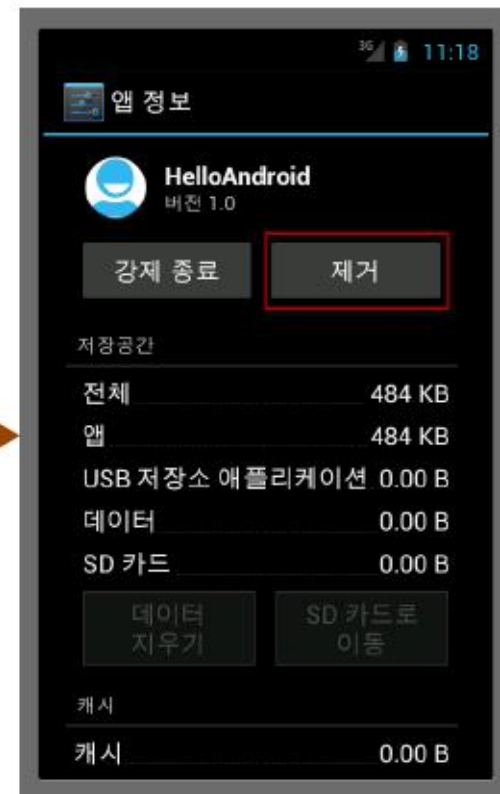
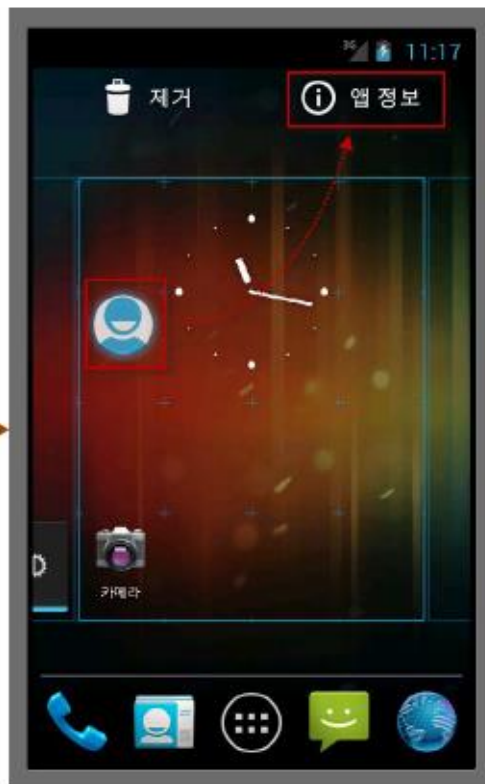
## 디스플레이 설정 변경



## ❖ 바탕화면에 응용 프로그램 복사 및 삭제



## 응용 프로그램 완전 삭제



```

MainActivity.java x
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 x
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 {

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

```

? android.support.v7.app.AppCompatActivity? Alt+Enter

2. 클릭 후 [Alt] + [Enter]

3. 클릭

MainActivity.java x

```

package com.example.administrator.s20150001;

public class MainActivity extends AppCompatActivity {

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

```

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

```

5. 클릭 후 [Alt] + [Enter]

? android.os.Bundle? Alt+Enter

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

- 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

6. 클릭

7. 추가 확인

MainActivity.java x

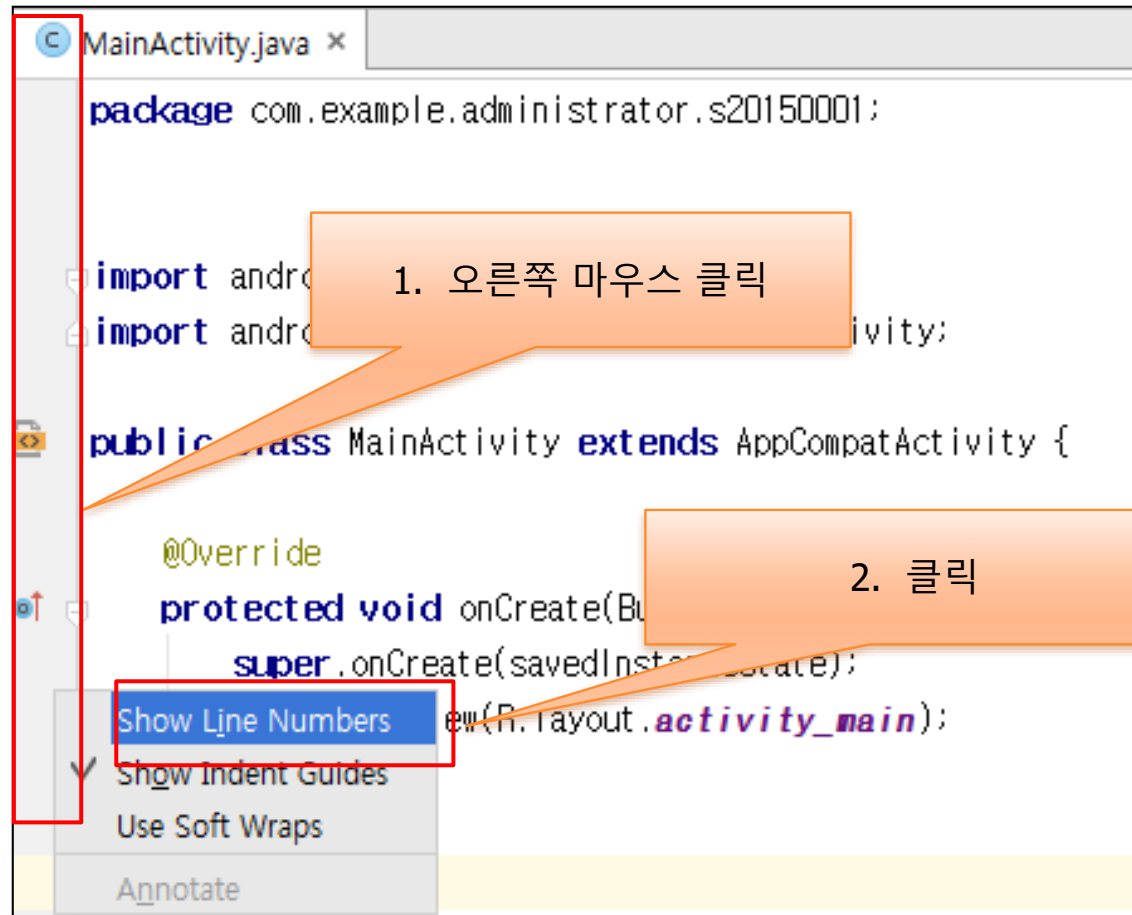
```
package com.example.administrator.s20150001;

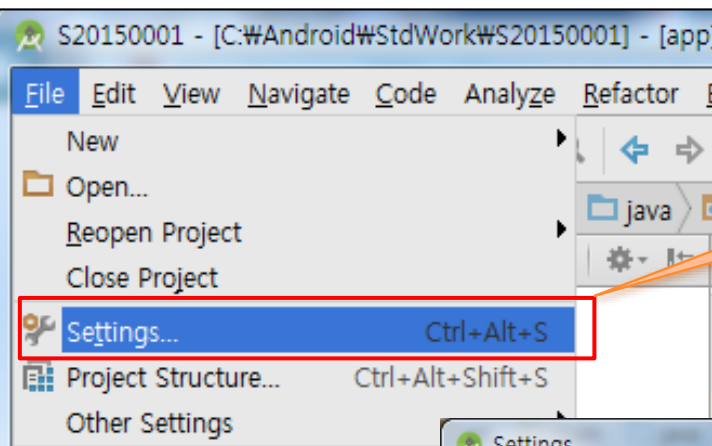
import android.os.Bundle;
import android.support.v7.app.AppCompatActivity;

public class MainActivity extends AppCompatActivity {

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

7. 추가 확인

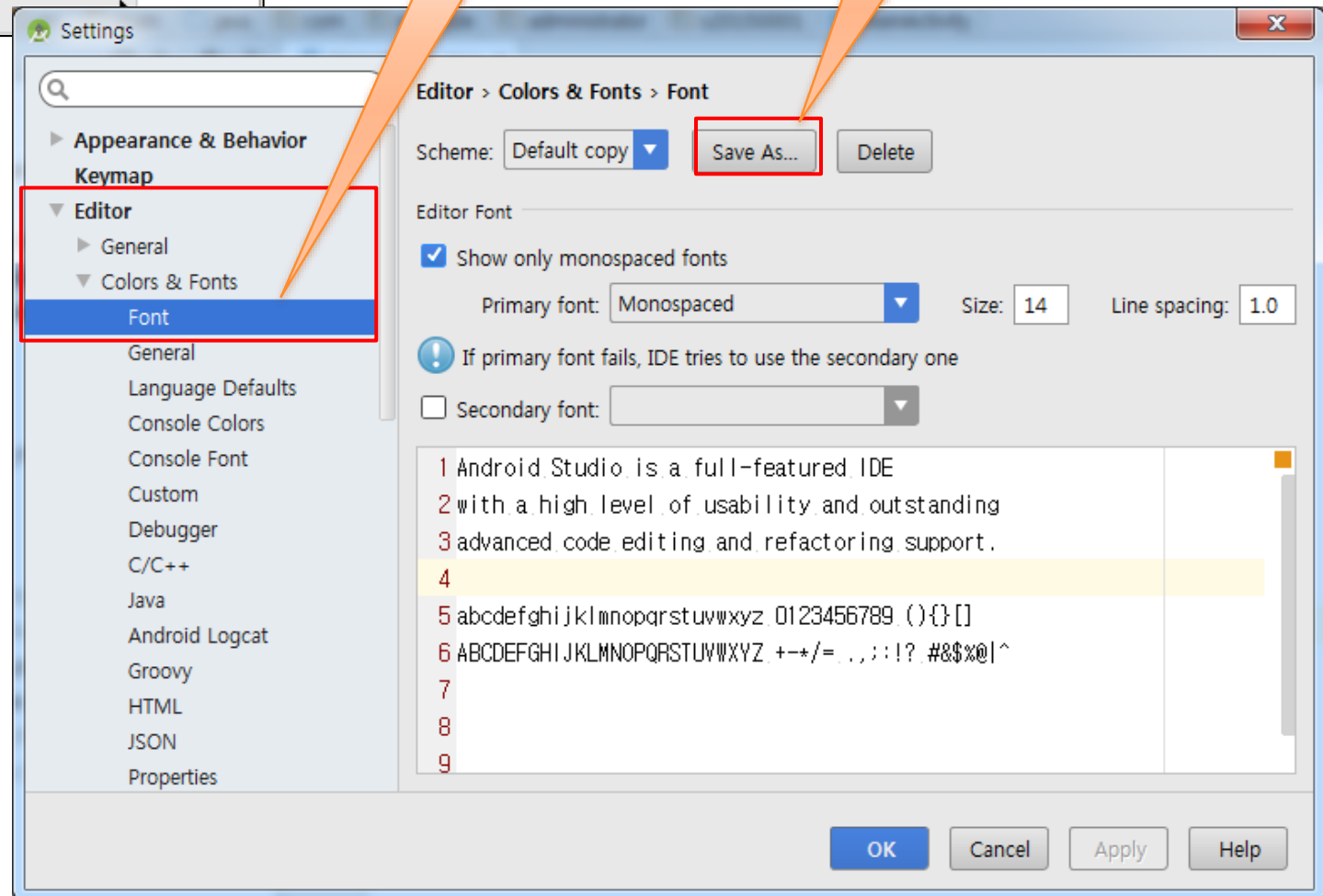


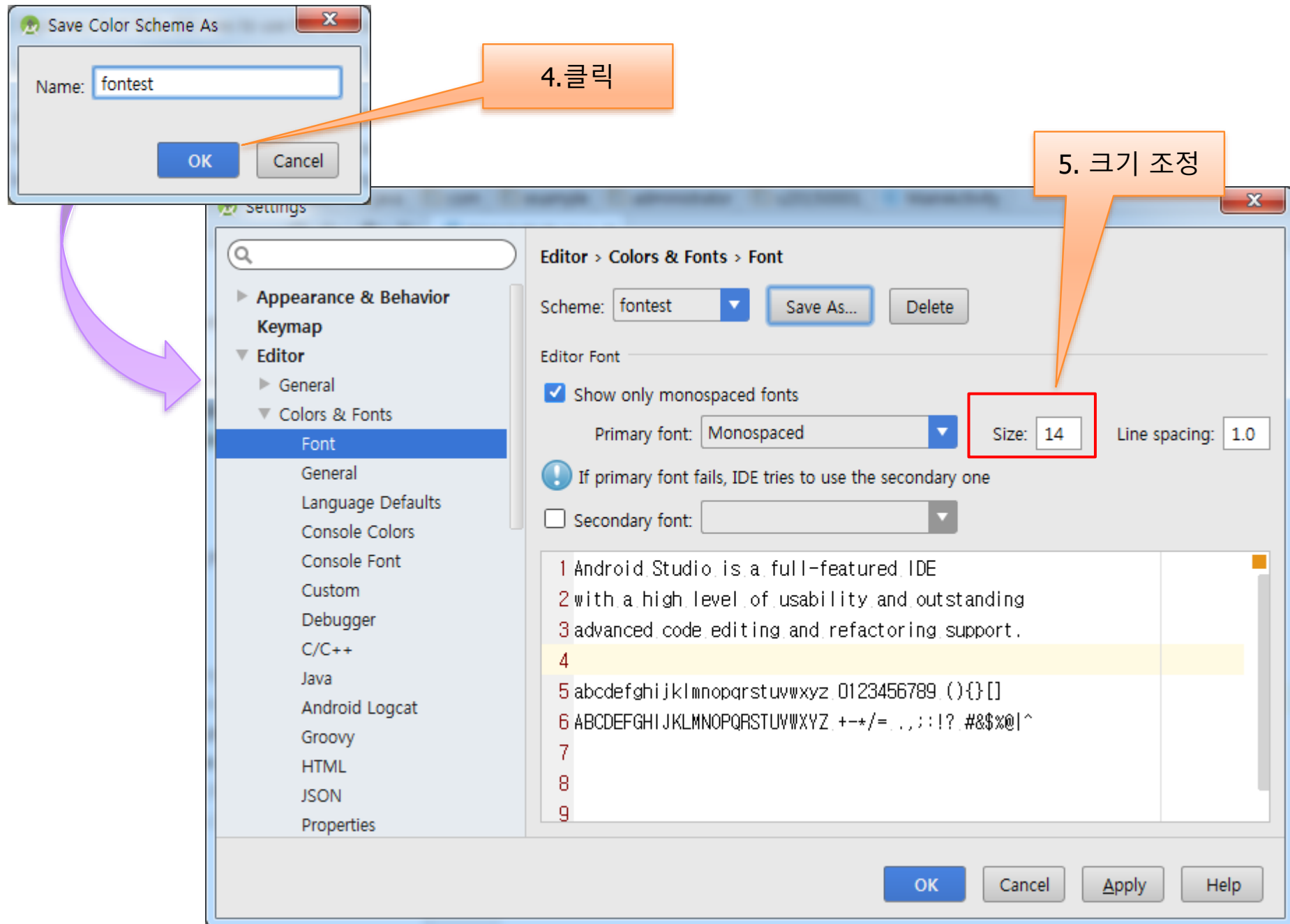


1. 클릭

2. 클릭

3. 클릭

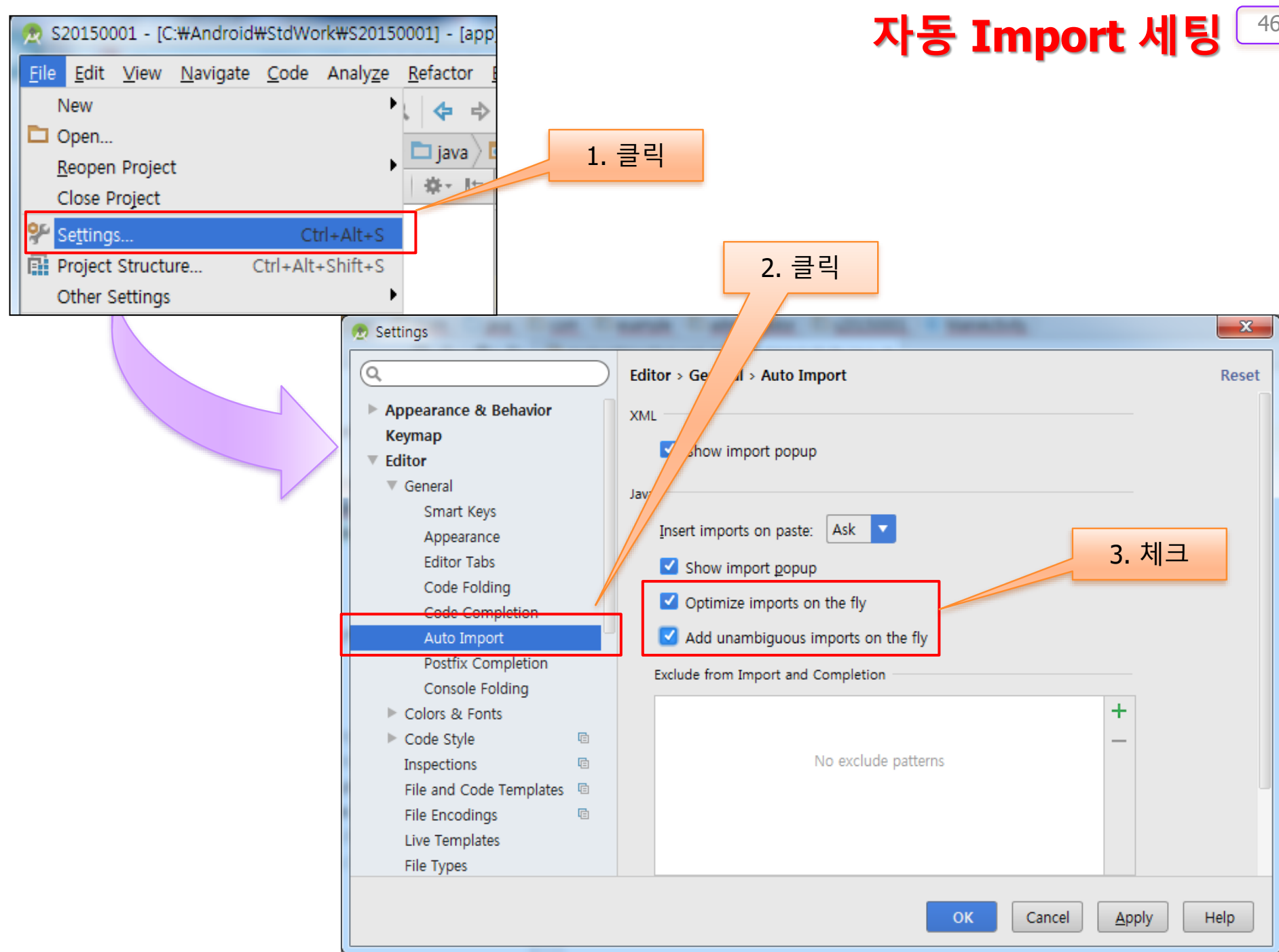




1. 클릭

2. 클릭

3. 체크



```
activity_main.xml x
<?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>
```

[CTRL] + [ALT] + L

activity\_main.xml x

```
<?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>
```