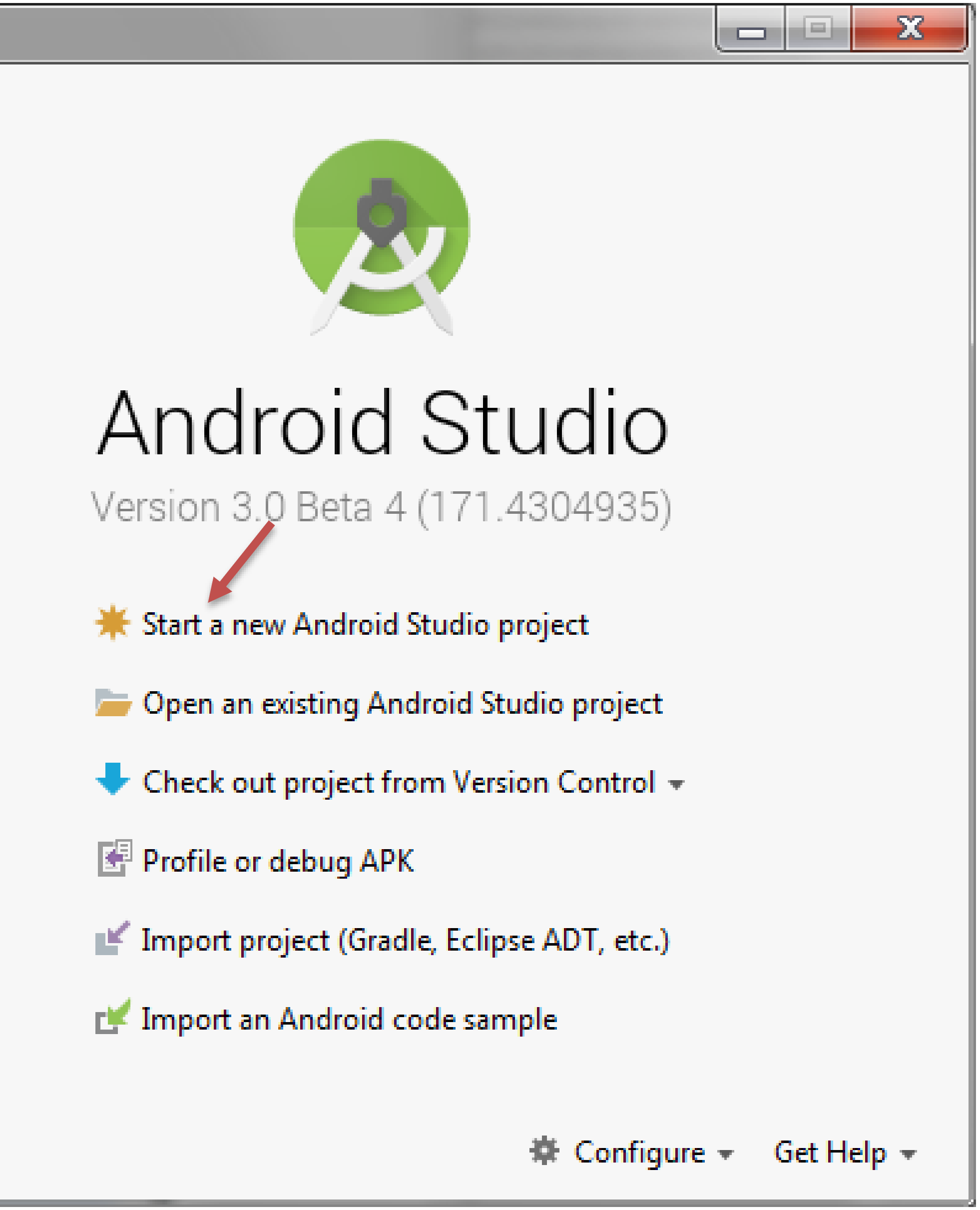
Mobile Programming

Lec 3. Making Your App Works

Ewha Womans University

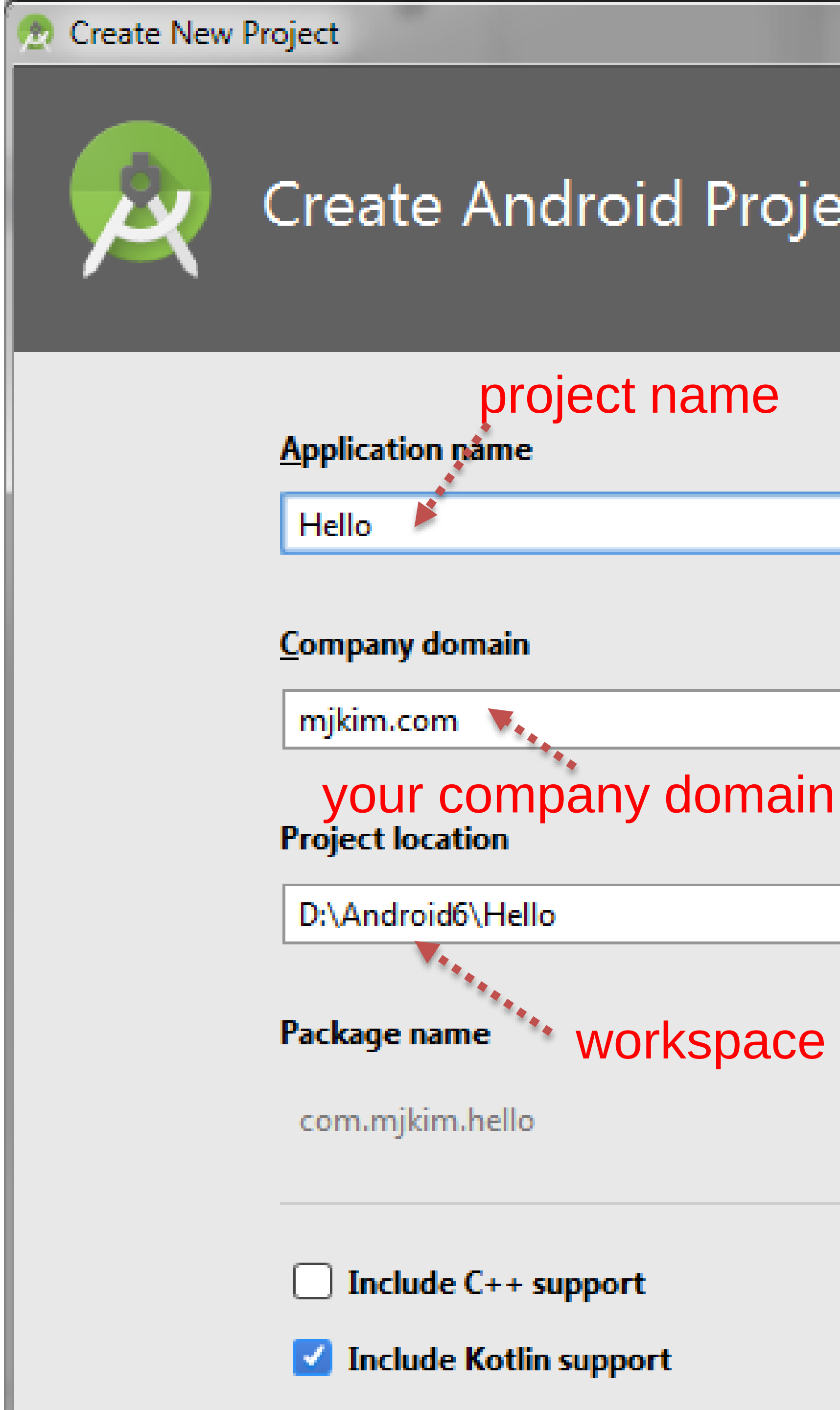
Create Project – Hello App



Android Studio

Version 3.0 Beta 4 (171.4304935)

✸ Start a new Android Studio project
Open an existing Android Studio project
Check out project from Version Control
Profile or debug APK
Import project (Gradle, Eclipse ADT, etc.)
Import an Android code sample
Configure
Get Help



Create New Project

Create Android Proje

project name

Application name

Hello

Company domain

mjkim.com

your company domain

Project location

D:\Android6\Hello

workspace

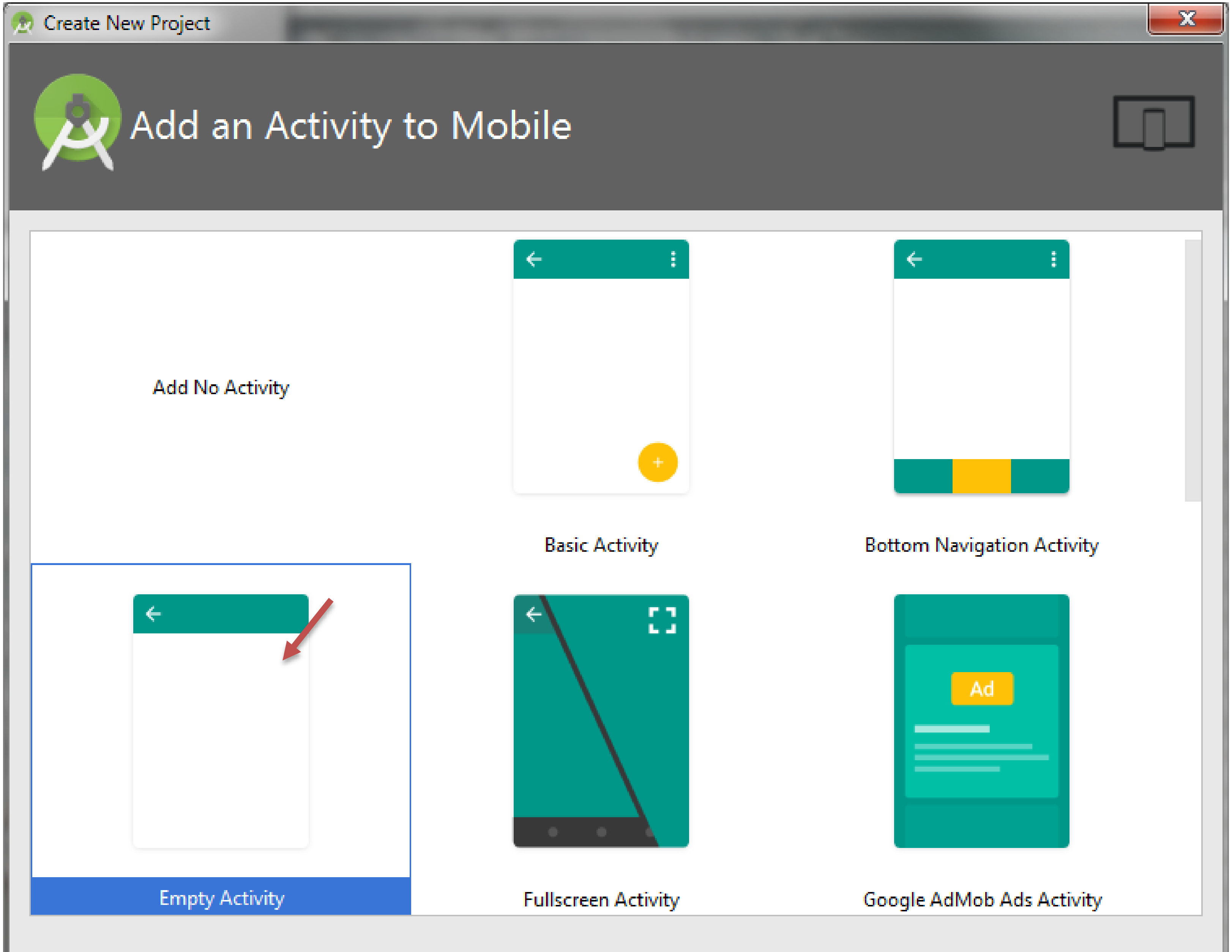
Package name

com.mjkim.hello

☐ Include C++ support

☑ Include Kotlin support

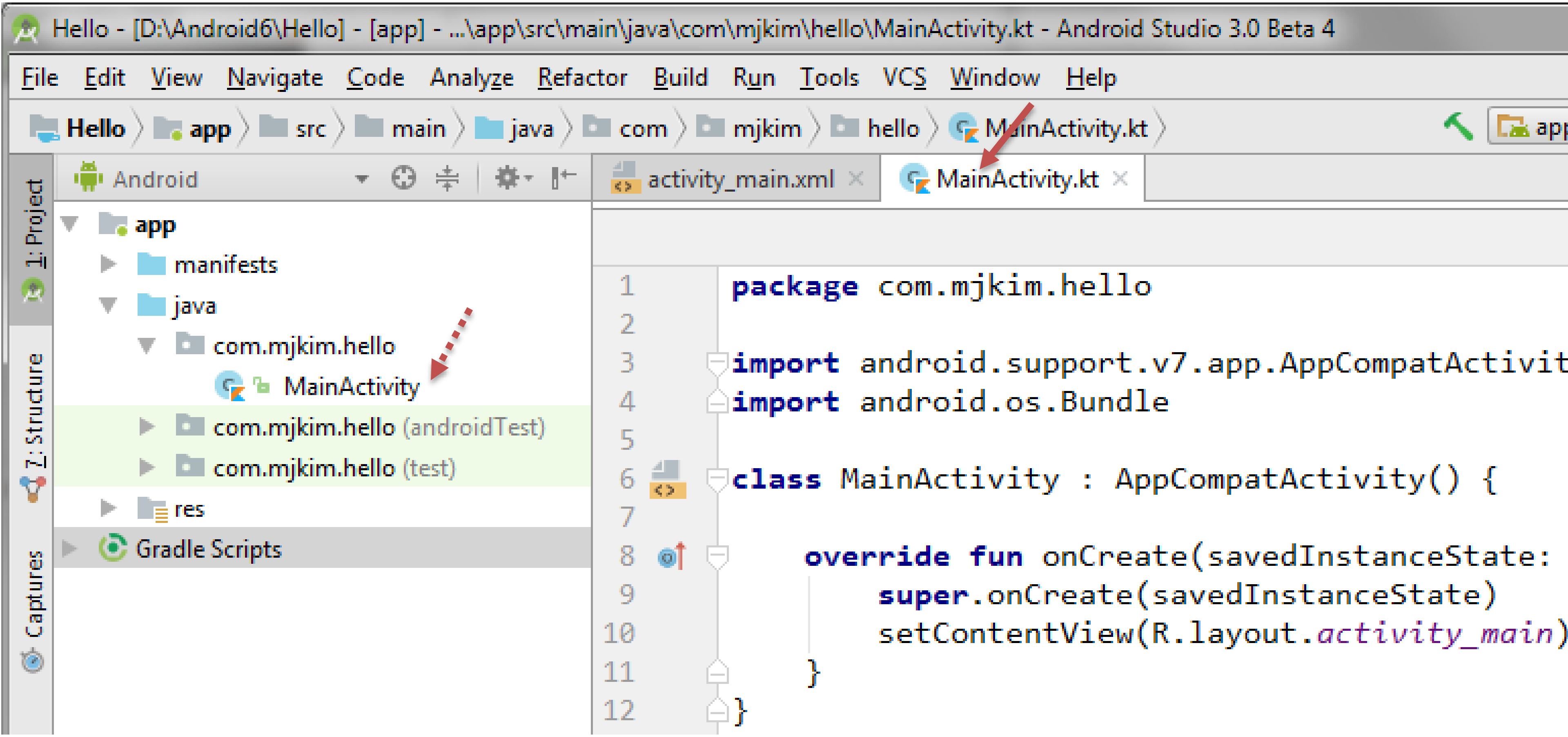
Select Empty Activity



Create New Project

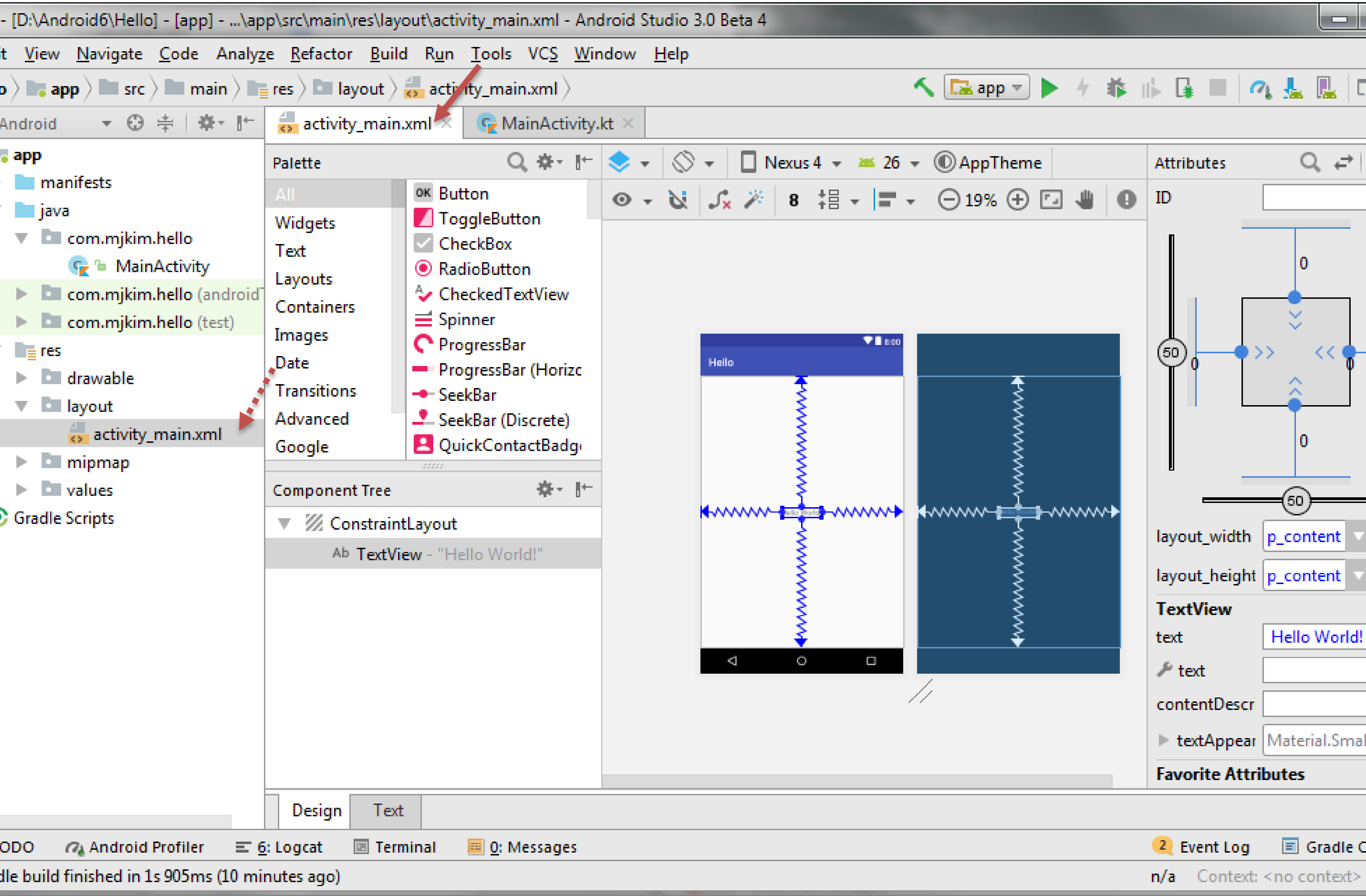
Add an Activity to Mobile

MainActivity.kt (Kotlin code for actions)



```
package com.mjkim.hello

import android.support.v7.app.AppCompatActivit
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState:
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

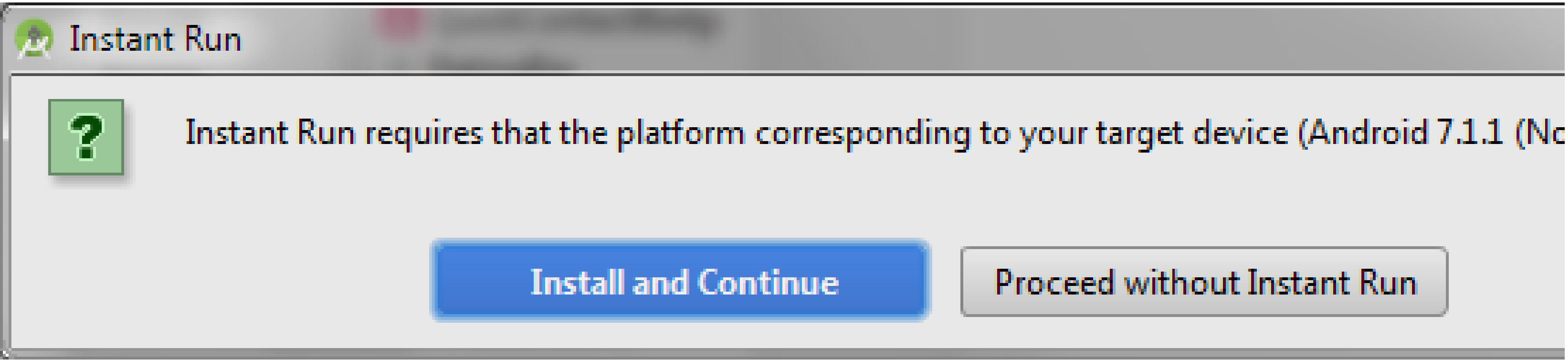
activity_main.xml (GUI Layout)



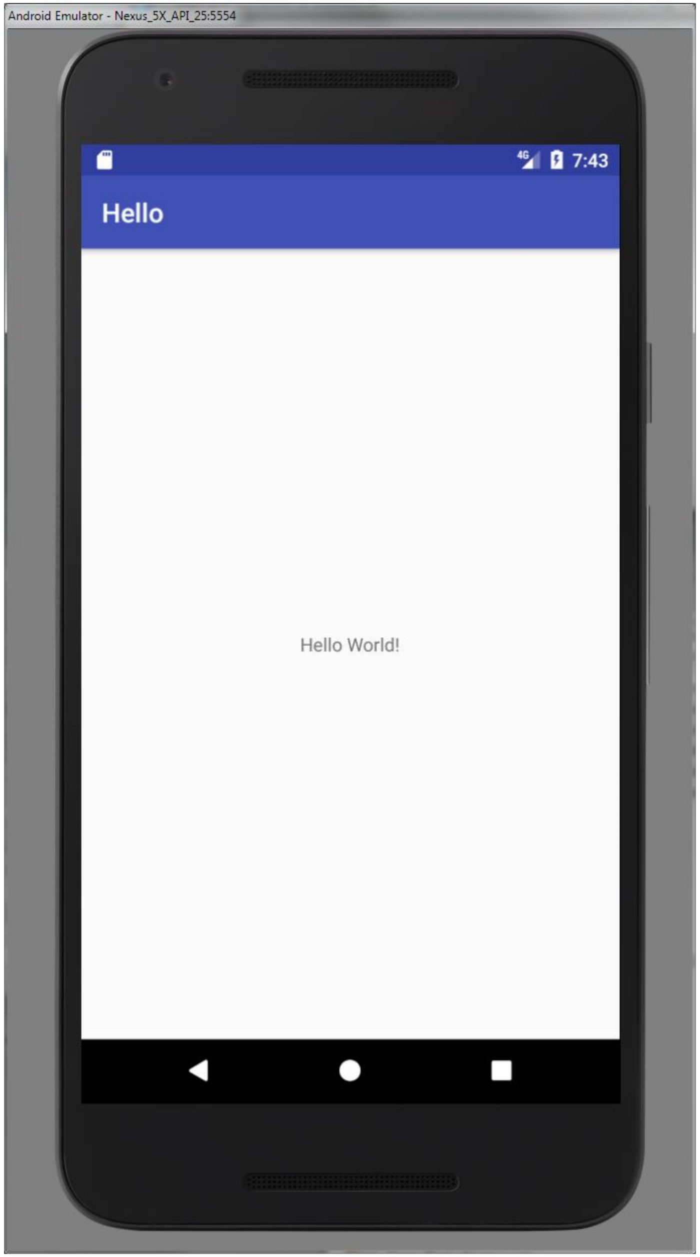
- [D:\Android6\Hello] - [app] - ...\app\src\main\res\layout\activity_main.xml - Android Studio 3.0 Beta 4

dle build finished in 1s 905ms (10 minutes ago)

Recommend not use ‘Instant Run’ (yet)



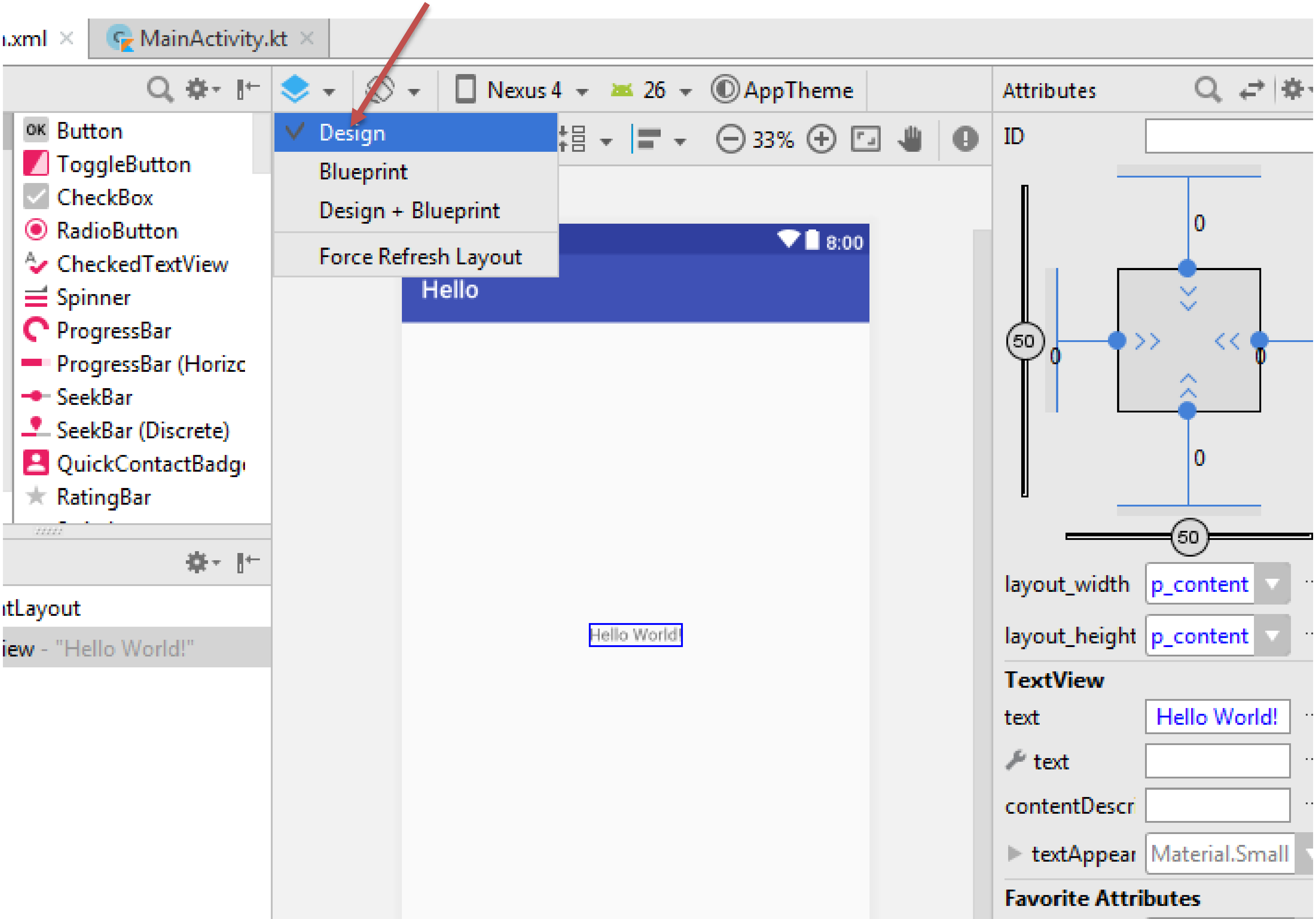
Instant Run requires that the platform corresponding to your target device (Android 7.1.1 (Nc



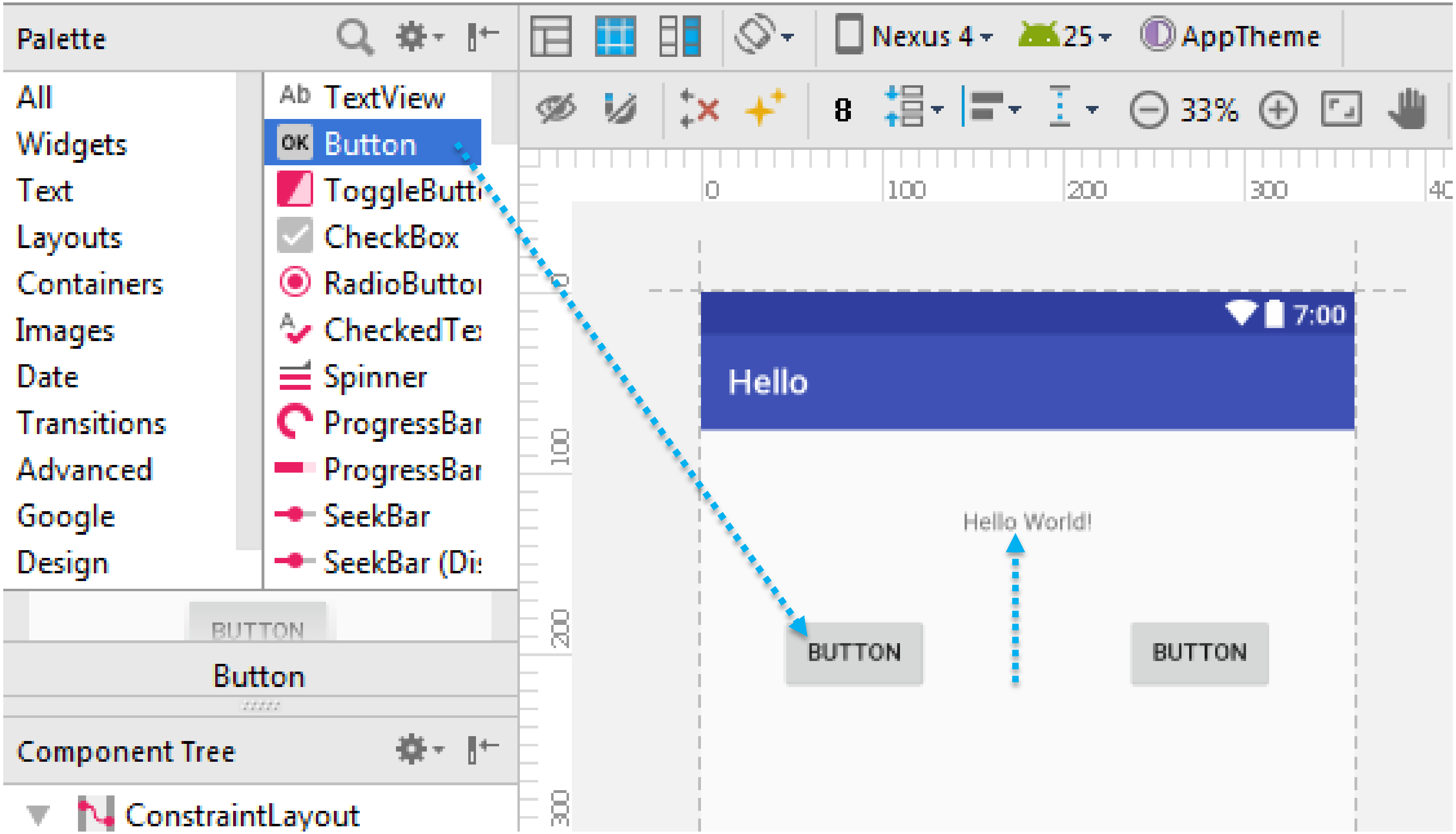
Hello World!

Add buttons and Layout

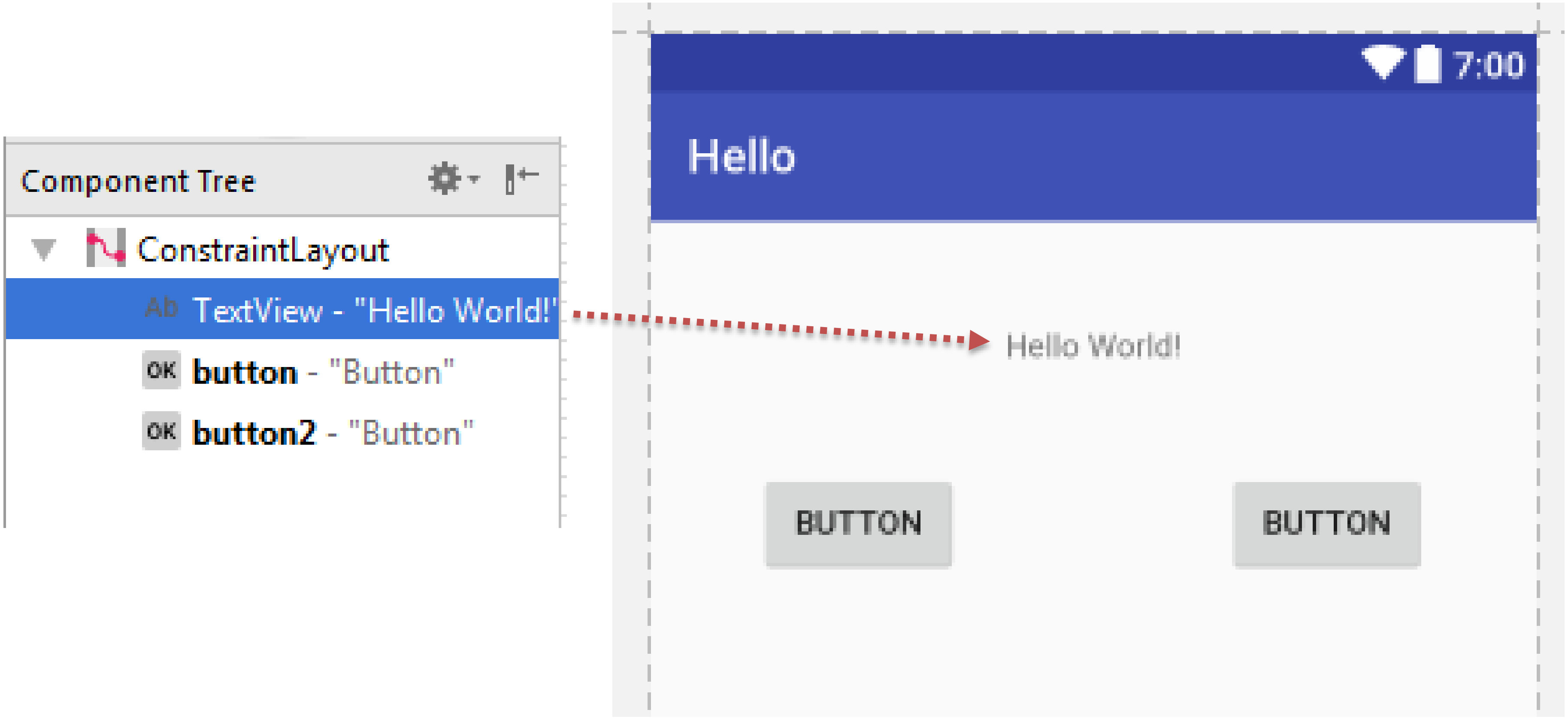
Design View


.xml
MainActivity.kt
Nexus 4
26
AppTheme
Attributes
✓ Design
Blueprint
Design + Blueprint
Force Refresh Layout
33%
Button
ToggleButton
CheckBox
RadioButton
CheckedTextView
Spinner
ProgressBar
ProgressBar (Horizc
SeekBar
SeekBar (Discrete)
QuickContactBadg
RatingBar
tLayout
iew - "Hello World!"
8:00
Hello
Hello World!
ID
0
50
0
0
0
50
layout_width
p_content
layout_height
p_content
TextView
text
Hello World!
text
contentDescr
textAppear
Material.Small
Favorite Attributes

Move text, Add button



Component Tree



Component Tree

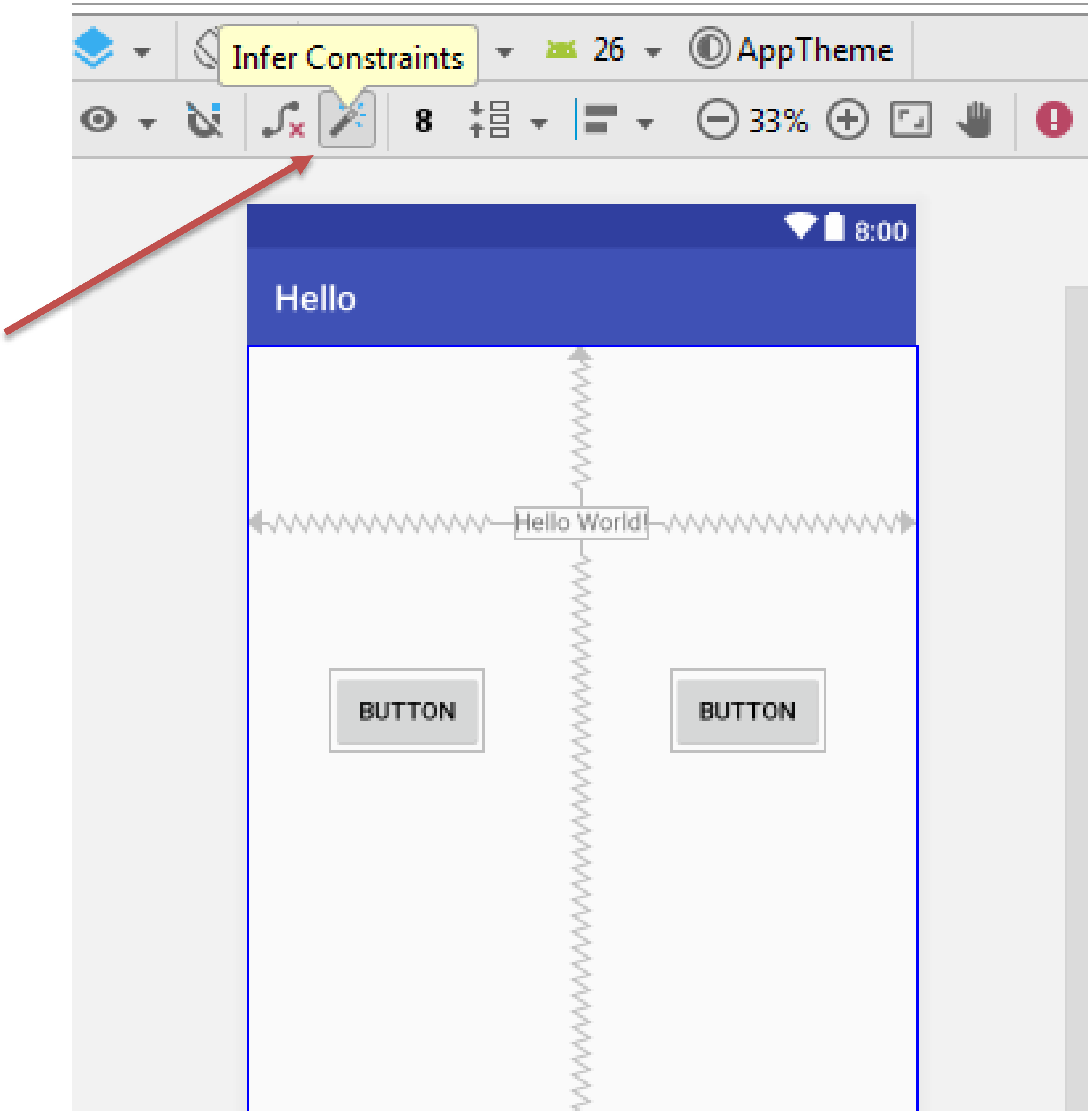
ConstraintLayout

TextView - "Hello World!"

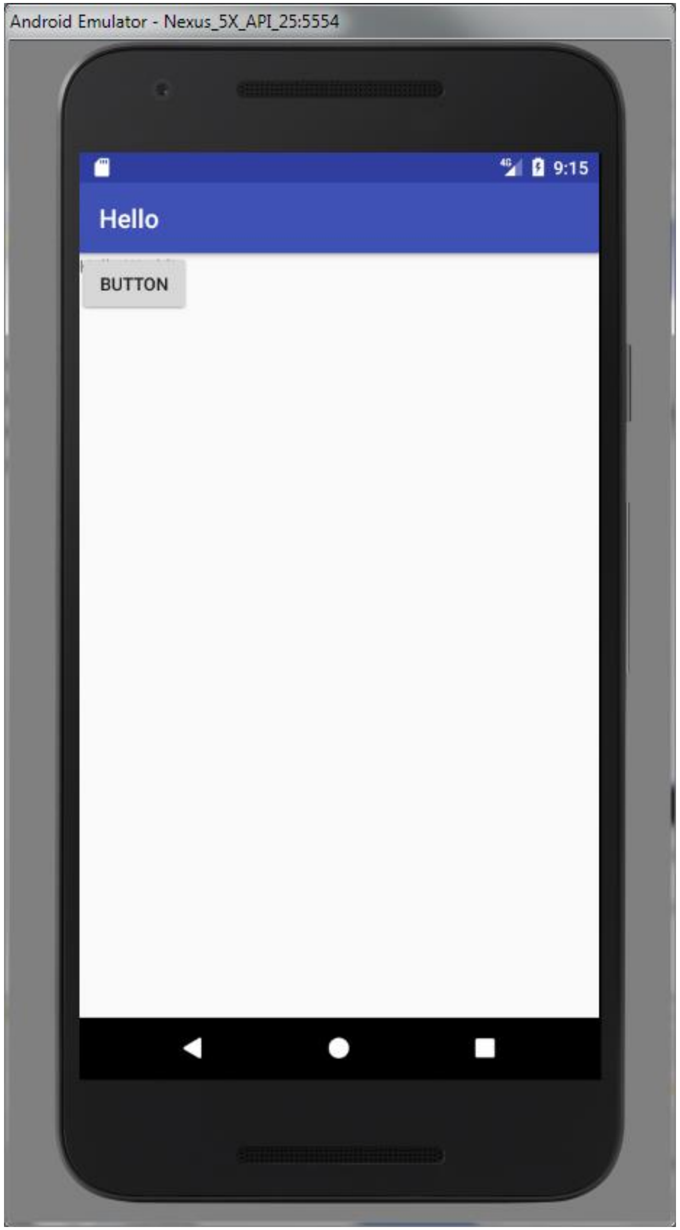
button - "Button"

button2 - "Button"

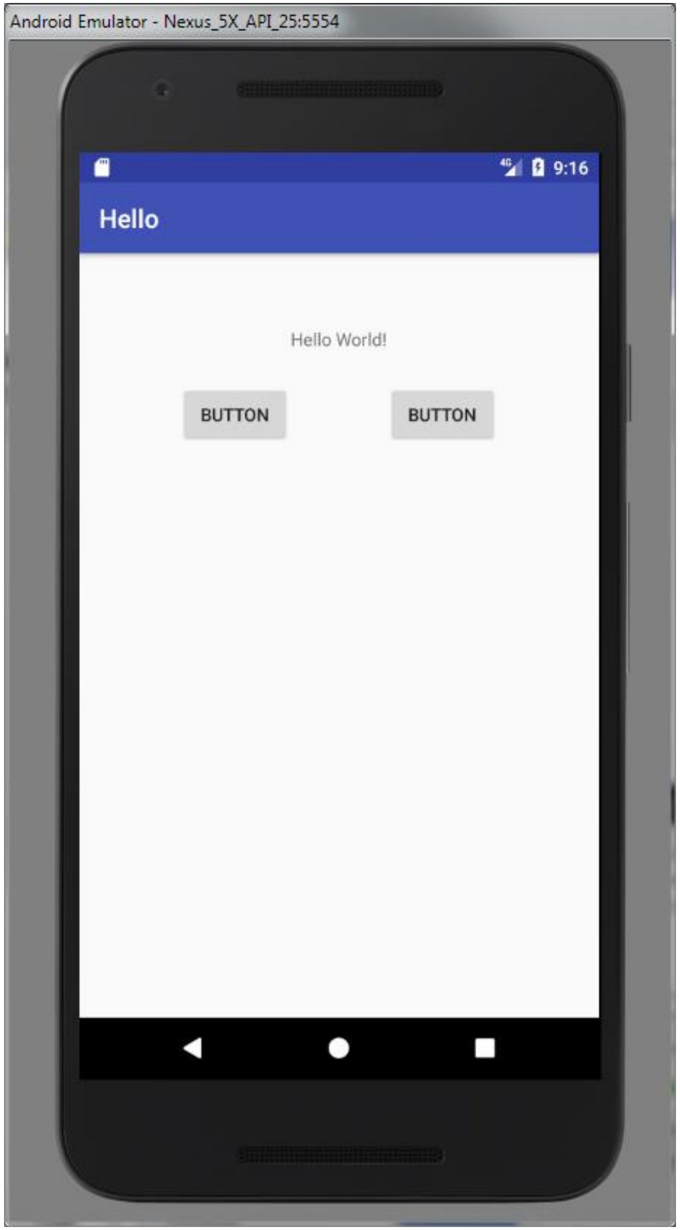
Do “Infer Constraints”



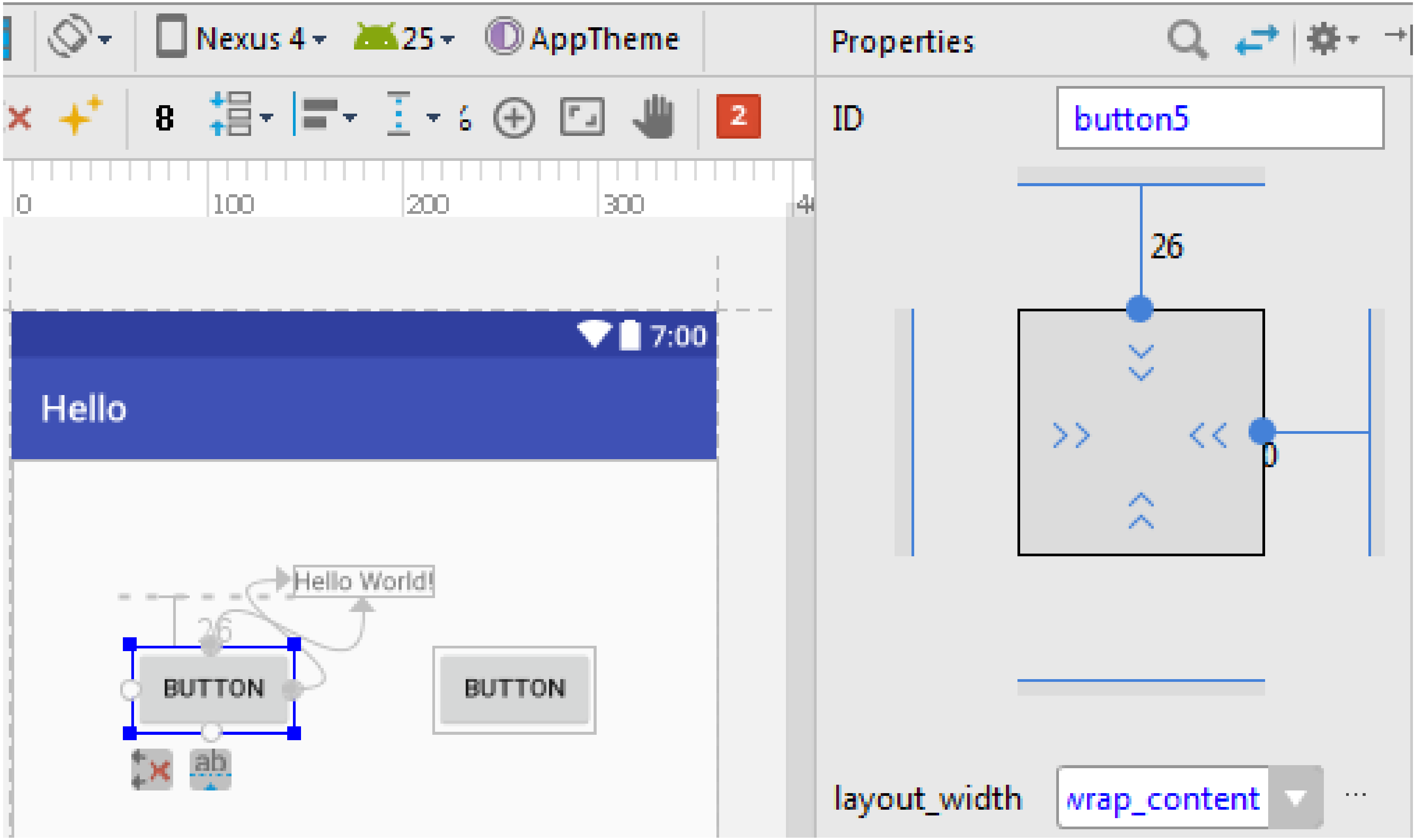
Without constraints… the layout doesn't work



Layout constraints



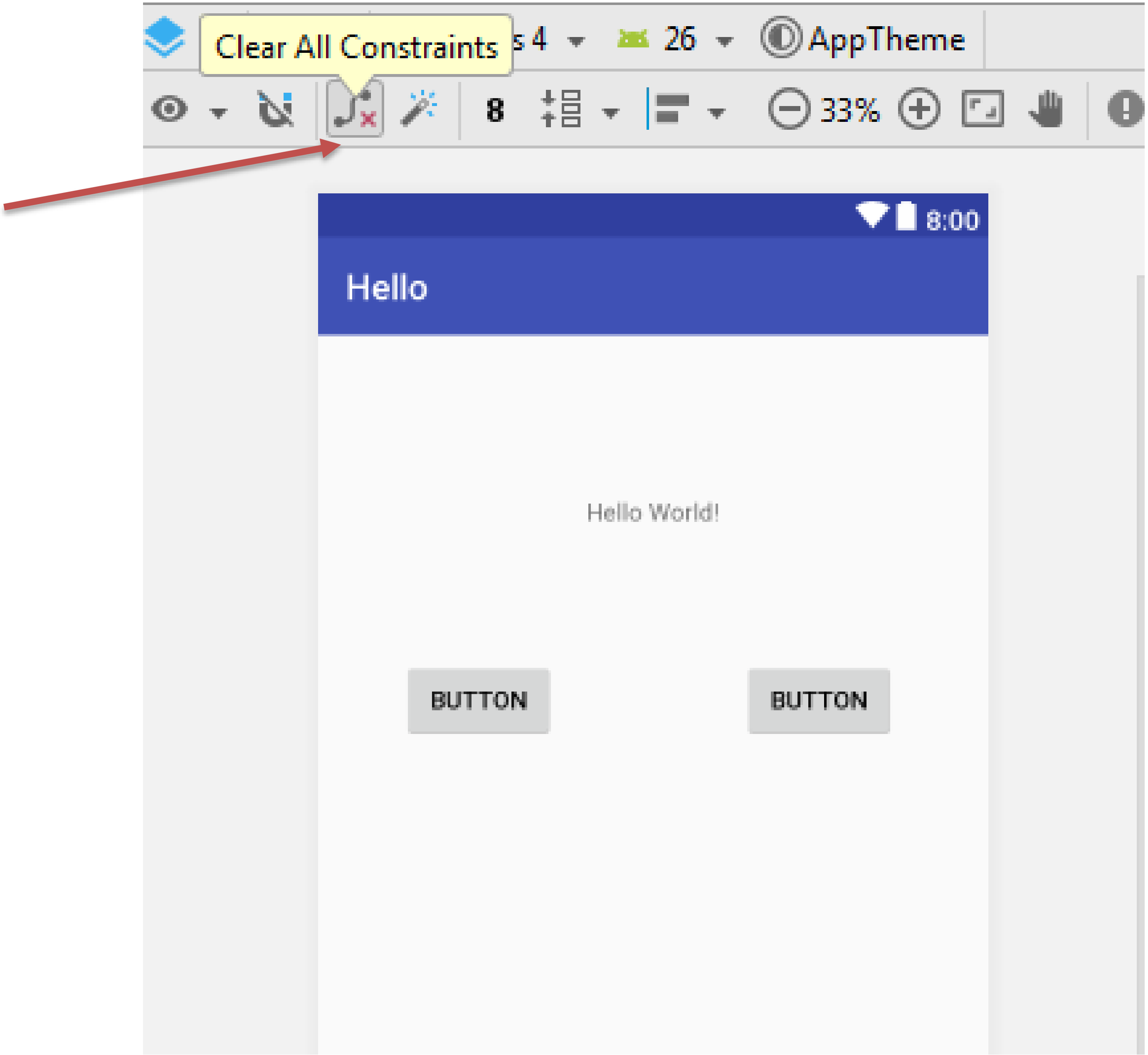
Constraints are relative position



ID: button5

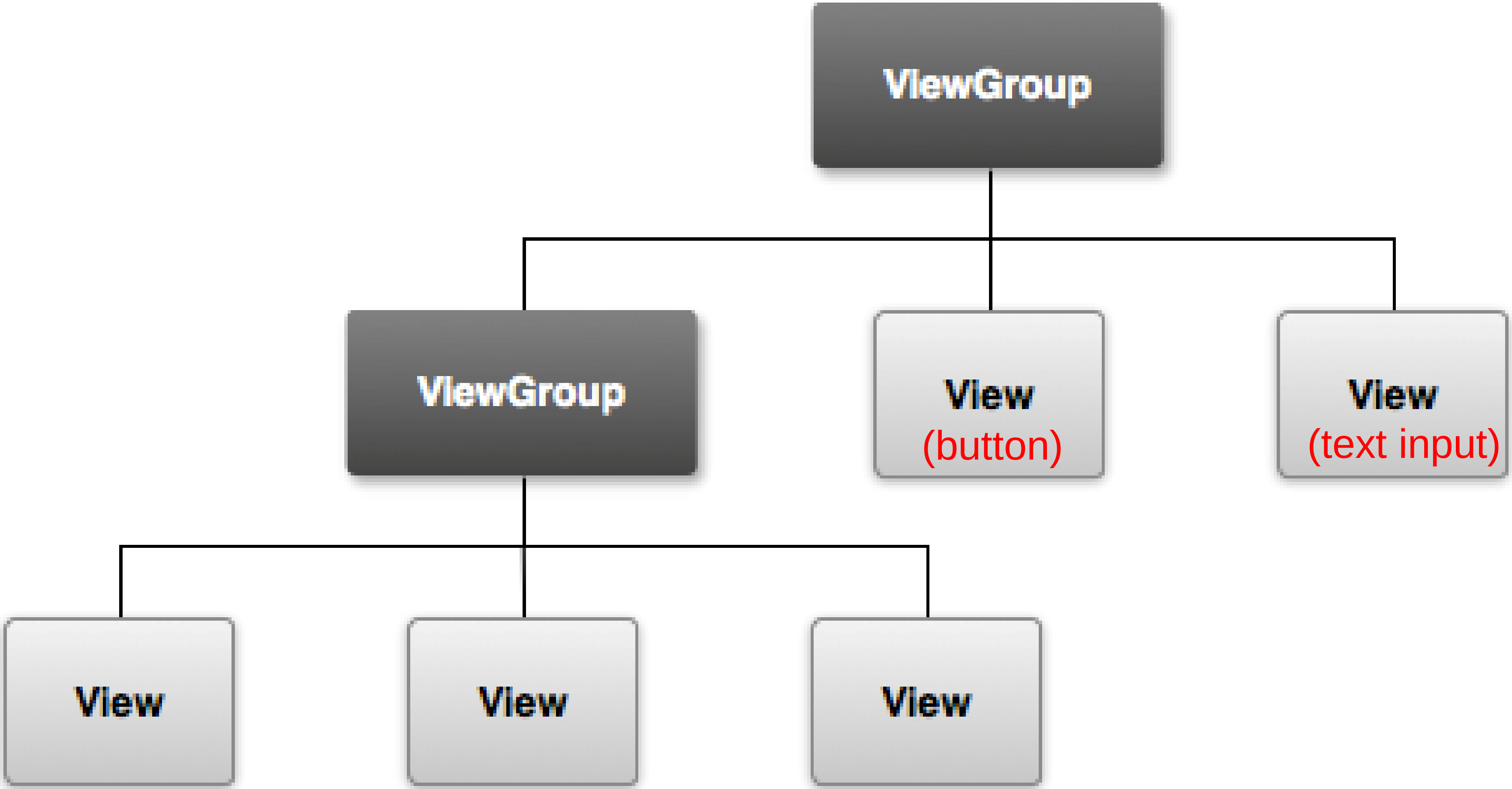
layout_width: wrap_content

Delete "Constraints" for (major) re-layout

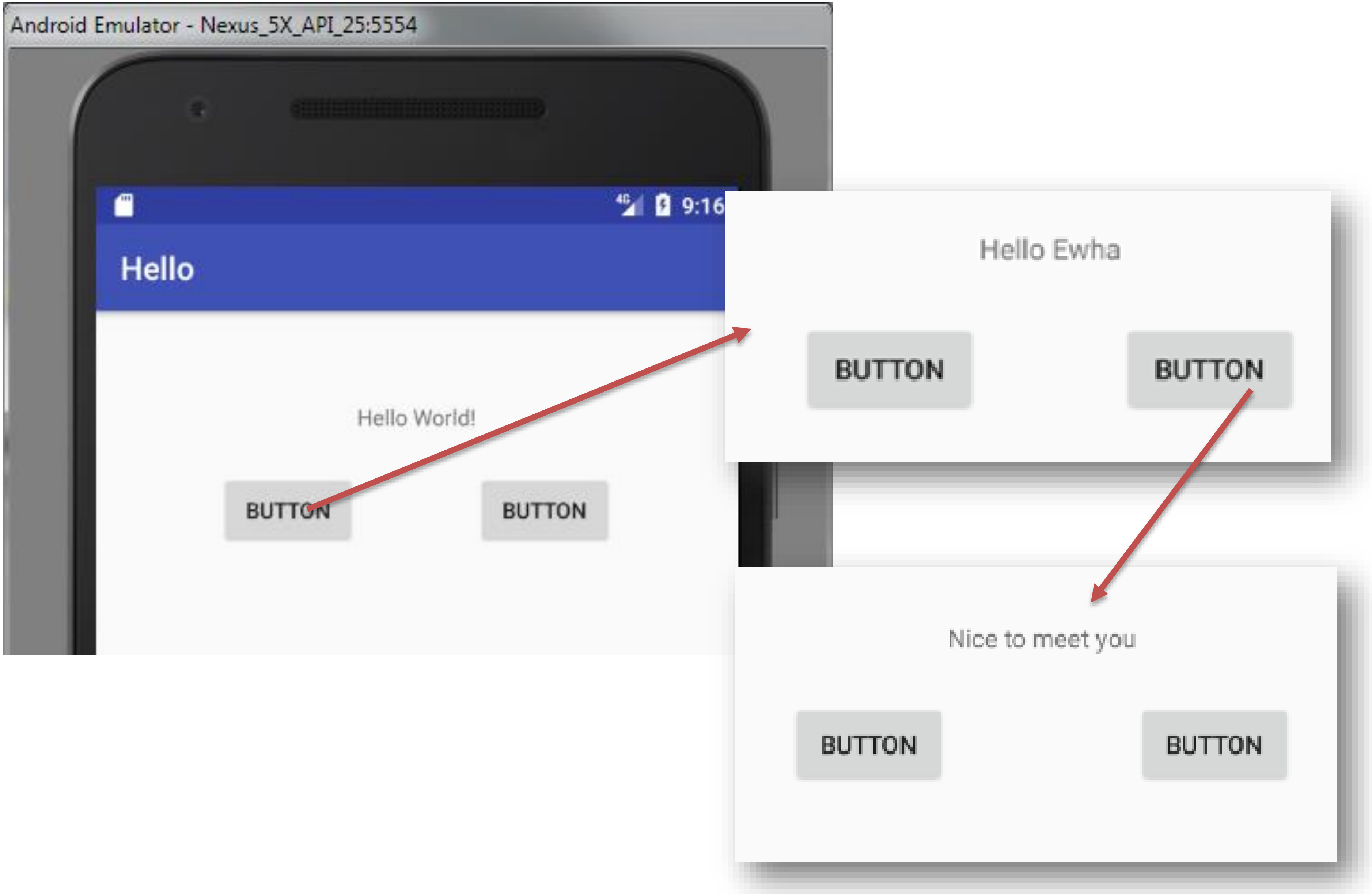


View & ViewGroup

- GUI is built using View & ViewGroup



Add button actions (Kotlin codes)



Android Emulator - Nexus_5X_API_25:5554

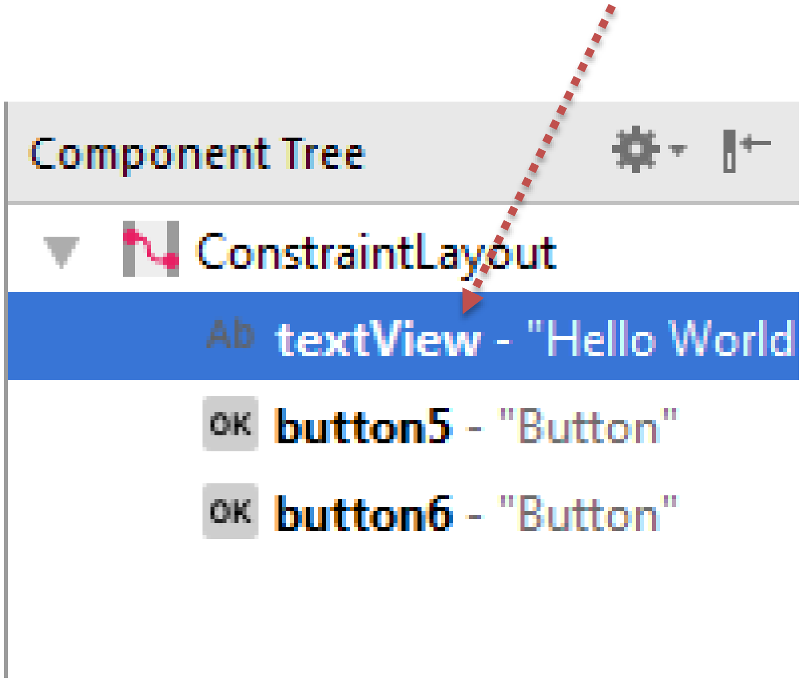
Hello

Hello World!

Hello Ewha

Nice to meet you

Check ID of TextView (Hello World)



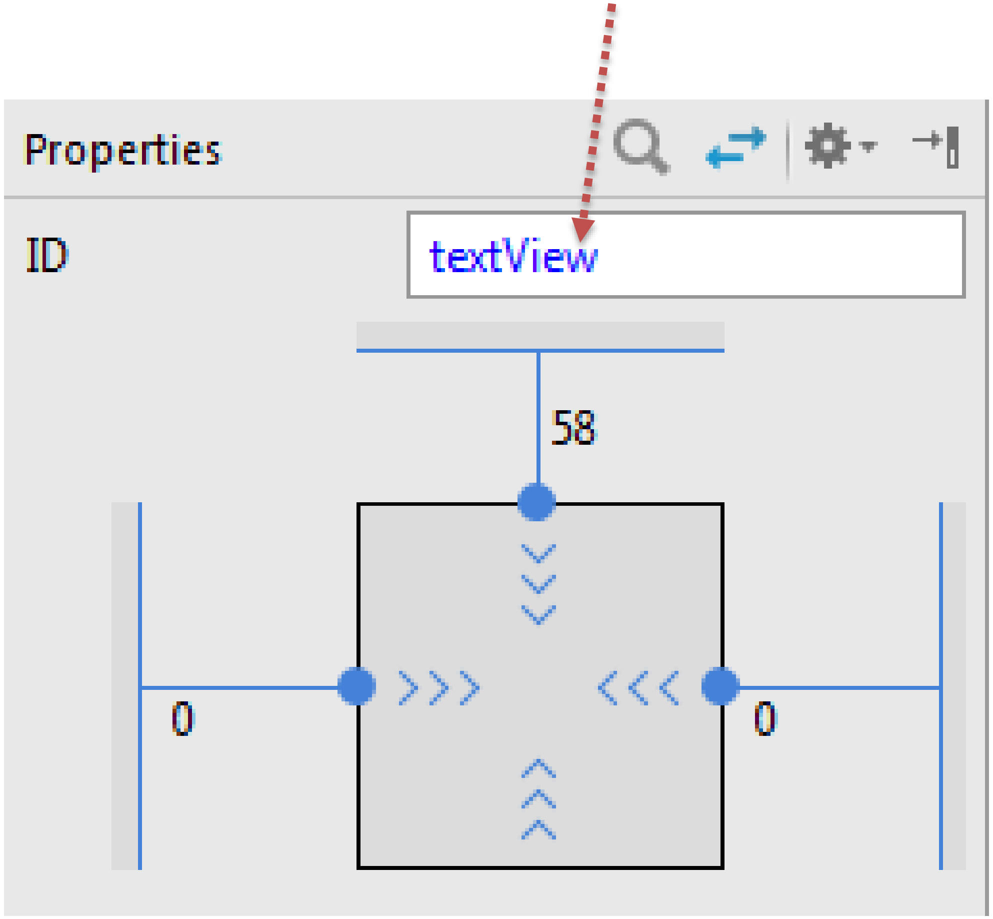
Component Tree

ConstraintLayout

Ab textView - "Hello World

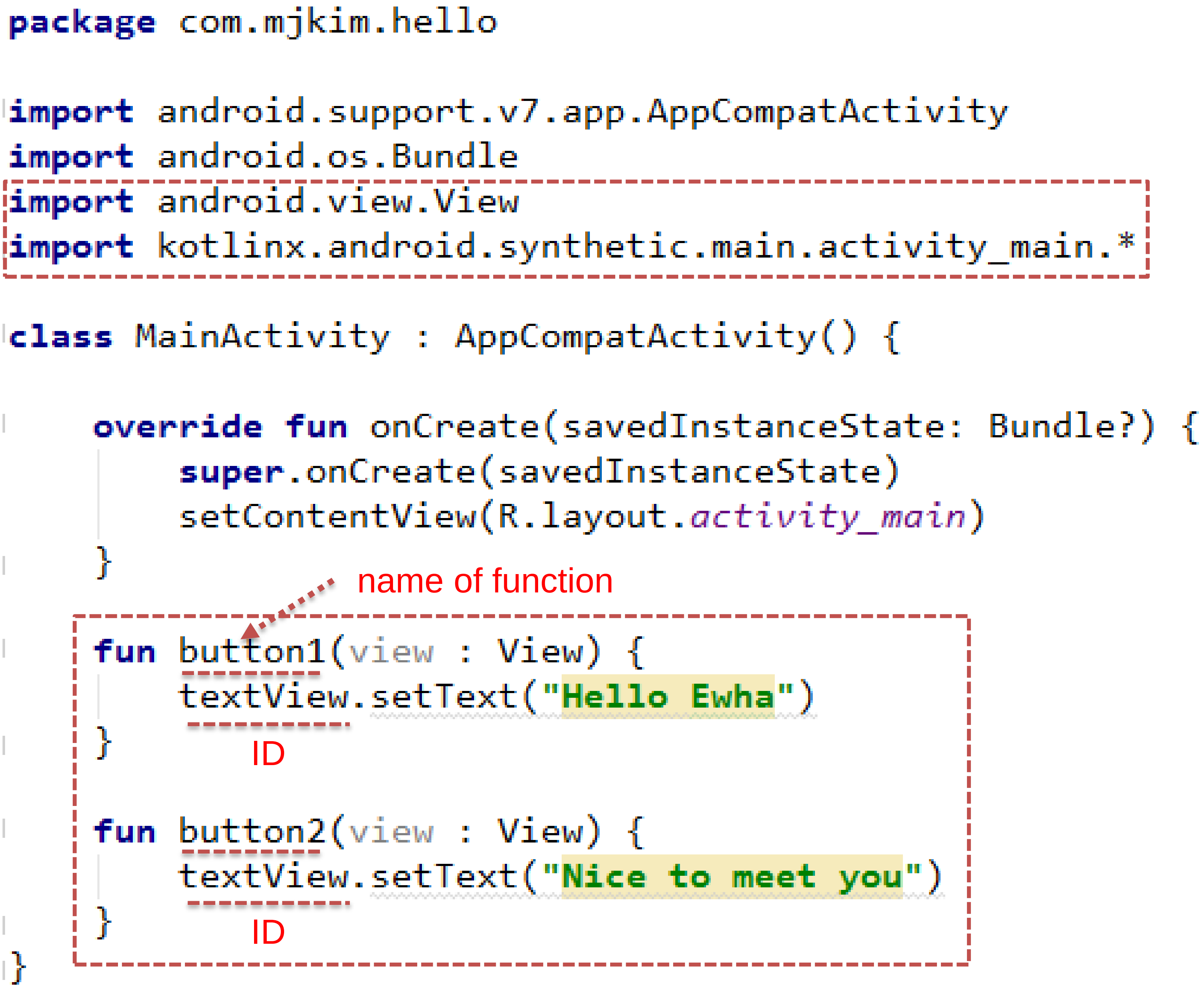
OK button5 - "Button"

OK button6 - "Button"



Properties

ID textView



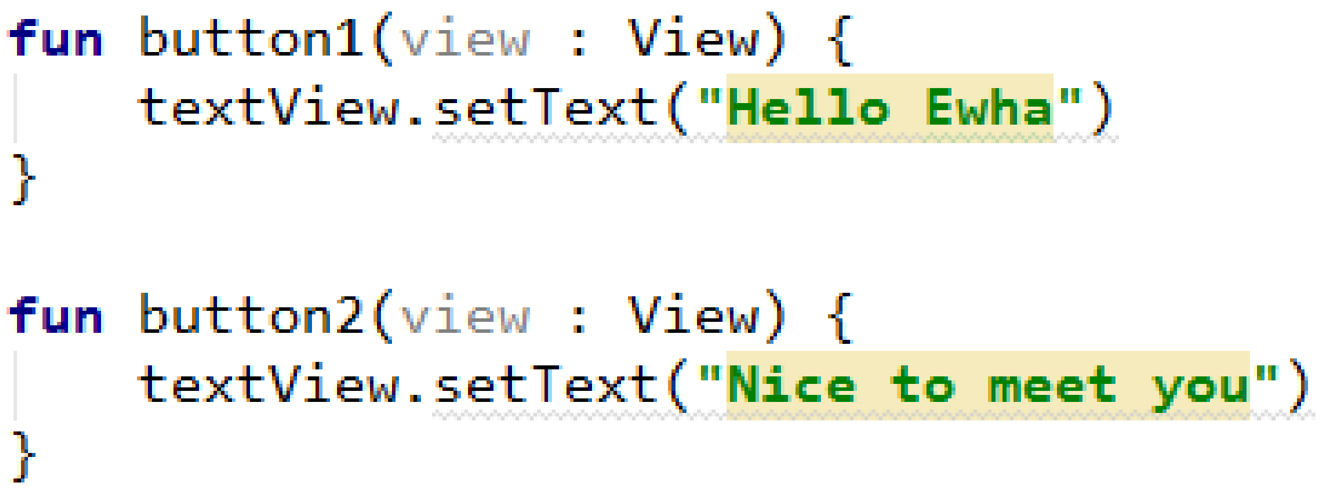
```kotlin
package com.mjkim.hello

import android.support.v7.app.AppCompatActivity
import android.os.Bundle
import android.view.View
import kotlinx.android.synthetic.main.activity_main.*

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }

    fun button1(view : View) {
        textView.setText("Hello Ewha")
    }

    fun button2(view : View) {
        textView.setText("Nice to meet you")
    }
}
```

name of function

ID

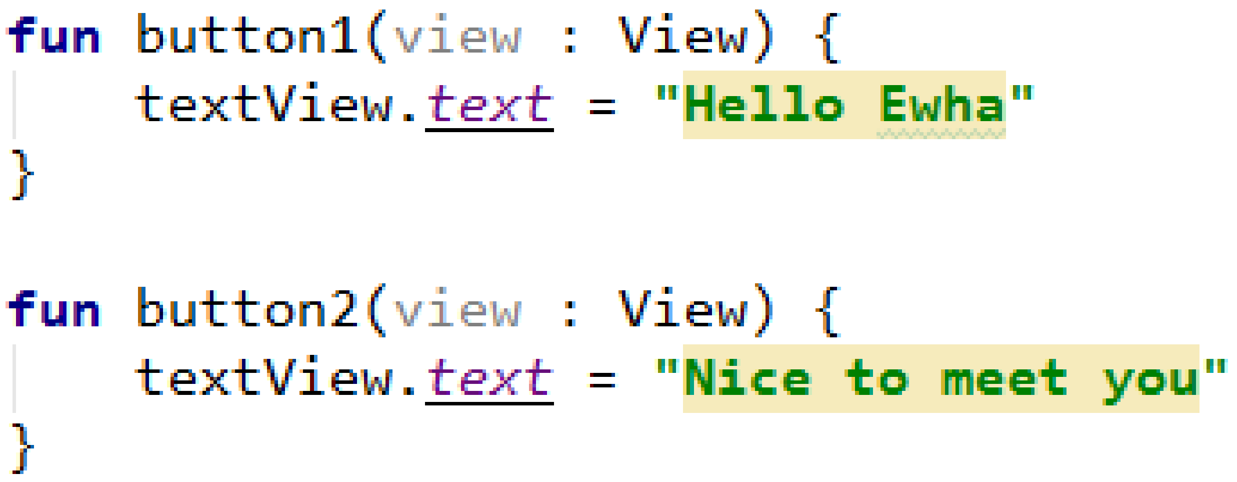
ID

The same, but different expression



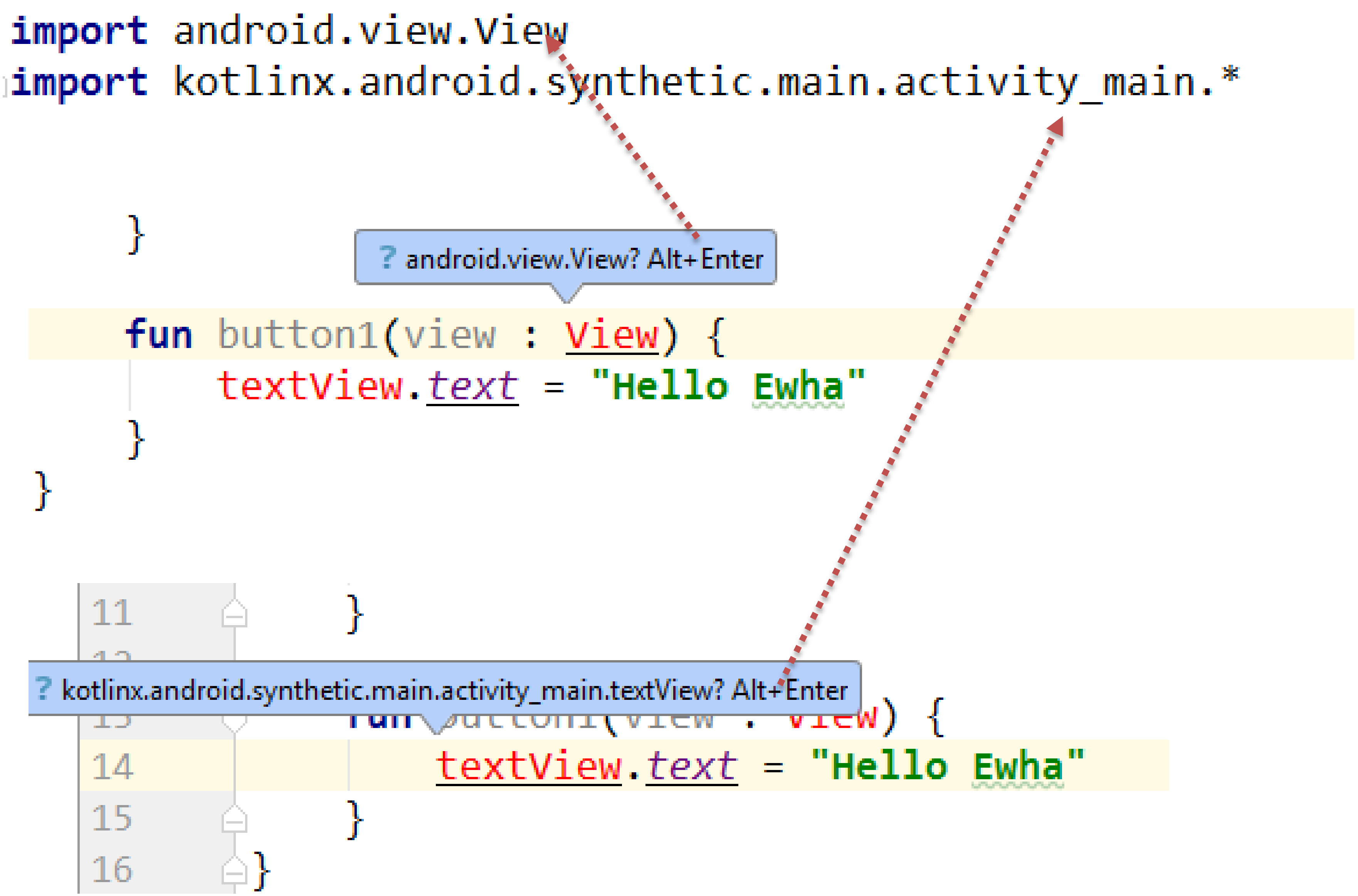
```
fun button1(view : View) {
    textView.setText("Hello Ewha")
}

fun button2(view : View) {
    textView.setText("Nice to meet you")
}
```

=



```
fun button1(view : View) {
    textView.text = "Hello Ewha"
}

fun button2(view : View) {
    textView.text = "Nice to meet you"
}
```

Android Studio(IntelliJ) helps you



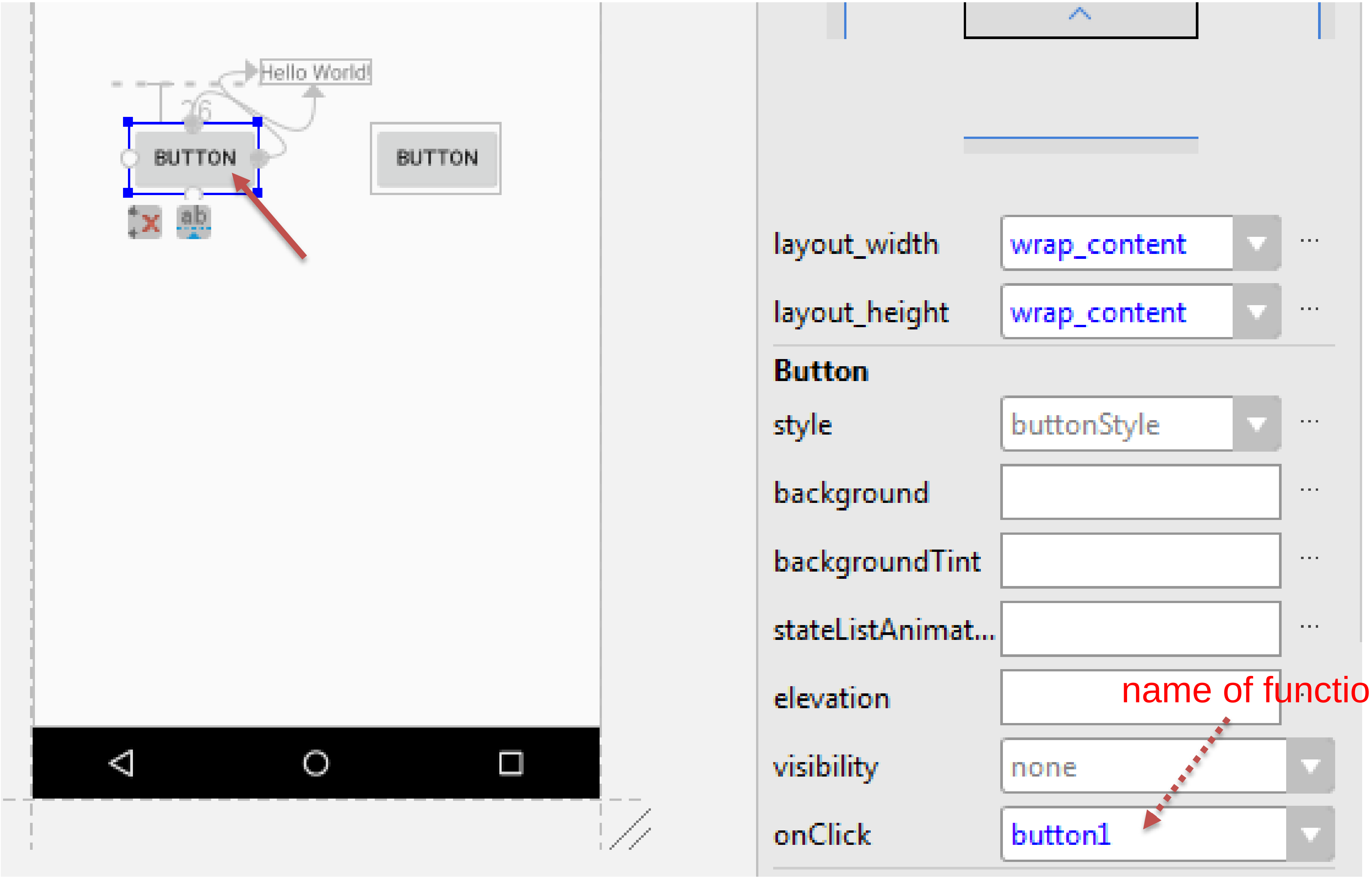
```
import android.view.View
import kotlinx.android.synthetic.main.activity_main.*


    }

    fun button1(view : View) {
        textView.text = "Hello Ewha"
    }
}
```

? android.view.View? Alt+Enter

```
    }

    fun button1(view : View) {
        textView.text = "Hello Ewha"
    }
}
```

? kotlinx.android.synthetic.main.activity_main.textView? Alt+Enter

Let Android knows : button → which function



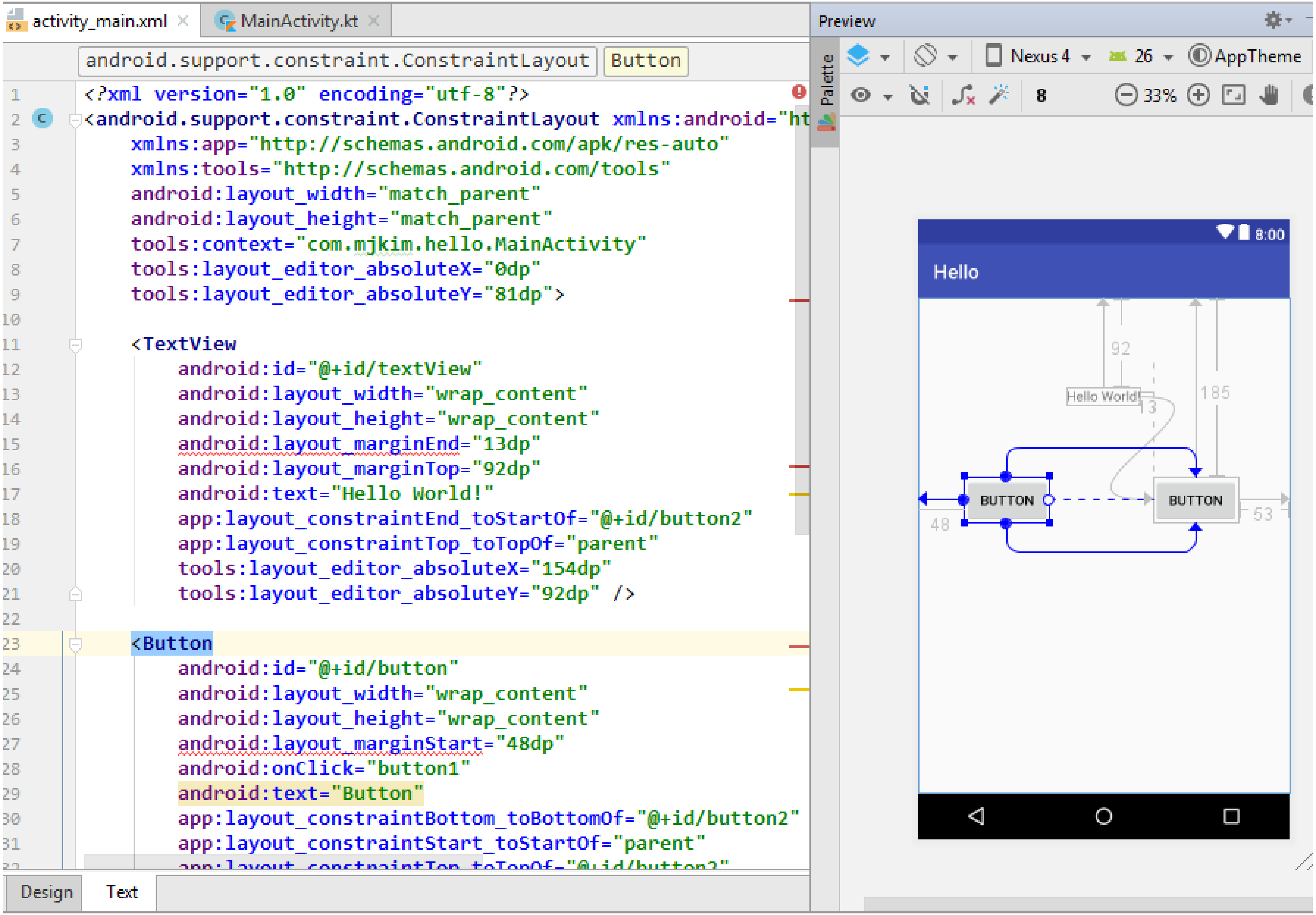
layout_width	wrap_content
layout_height	wrap_content

Button

style	buttonStyle
background	
backgroundTint	
stateListAnimat...	
elevation	
visibility	none
onClick	button1

name of function

Text(XML) view of GUI



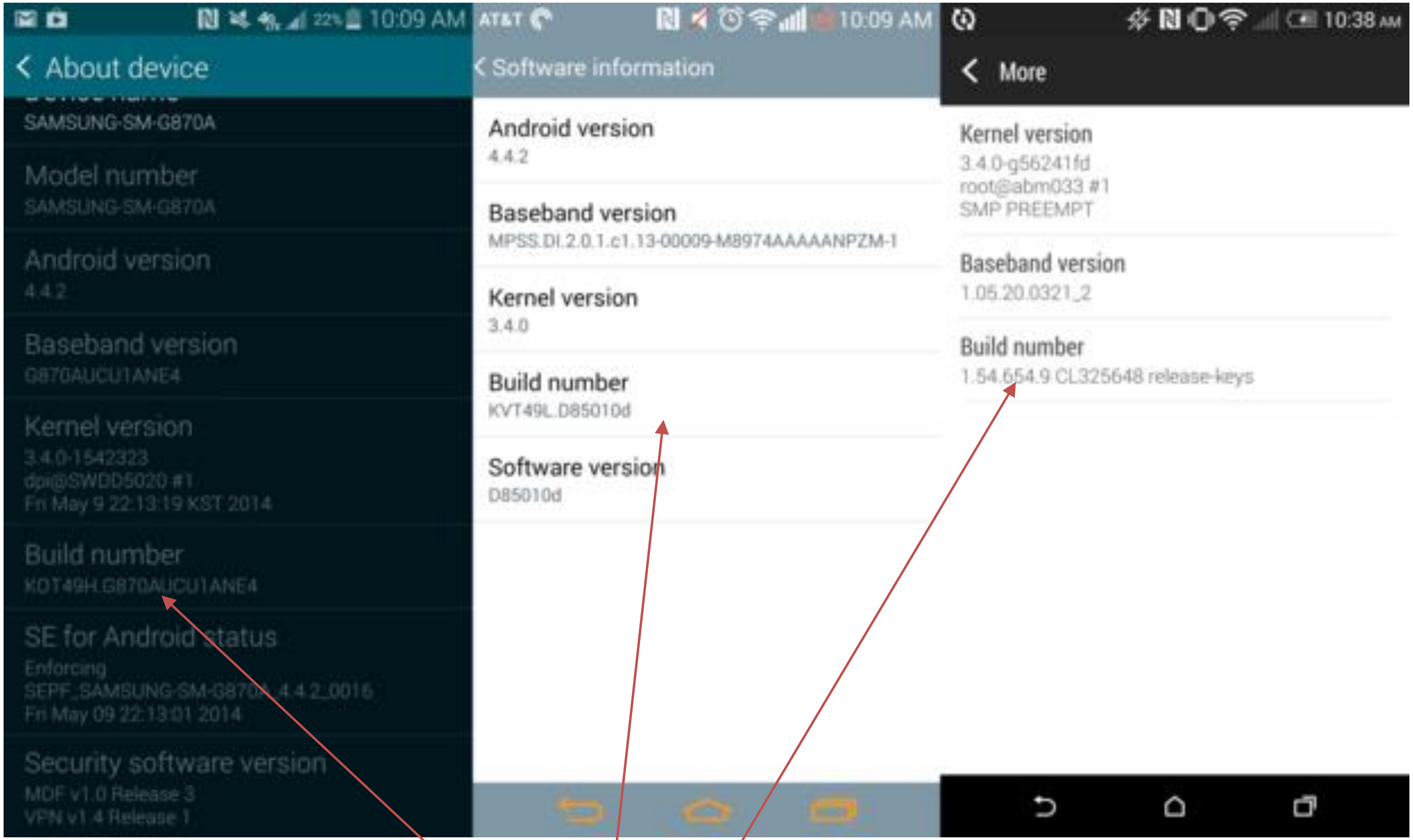
```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout xmlns:android="ht
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context="com.mjkim.hello.MainActivity"
    tools:layout_editor_absoluteX="0dp"
    tools:layout_editor_absoluteY="81dp">

    <TextView
        android:id="@+id/textView"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginEnd="13dp"
        android:layout_marginTop="92dp"
        android:text="Hello World!"
        app:layout_constraintEnd_toStartOf="@+id/button2"
        app:layout_constraintTop_toTopOf="parent"
        tools:layout_editor_absoluteX="154dp"
        tools:layout_editor_absoluteY="92dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginStart="48dp"
        android:onClick="button1"
        android:text="Button"
        app:layout_constraintBottom_toBottomOf="@+id/button2"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="@+id/button2"
```

Running on Real devices

Enable Developer Mode in Your Phone

- Enable “USB debugging”
  - Android 4.x ~
    - Setting/Developer Options/USB debugging
    - in 4.2 or higher
      - “Developer Options” is hidden
      - At the “About” screen, tap “Build number” 7 times to show “Developer Options”
  - Android 3.x
    - Setting/Applications/Development/USB debugging

Tap “Build number” 7 times



SAMSUNG-SM-G870A

Model number
SAMSUNG-SM-G870A

Android version
4.4.2

Baseband version
G870AUCU1ANE4

Kernel version
3.4.0-1542323
dpi@SWDD5020 #1
Fri May 9 22:13:19 KST 2014

Build number
KOT49H.G870AUCU1ANE4

SE for Android status
Enforcing
SEPF_SAMSUNG-SM-G870A_4.4.2_0016
Fri May 09 22:13:01 2014

Security software version
MDF v1.0 Release 3
VPN v1.4 Release 1

Android version
4.4.2

Baseband version
MPSS.DI.2.0.1.c1.13-00009-M8974AAAAANPZM-1

Kernel version
3.4.0

Build number
KVT49L.D85010d

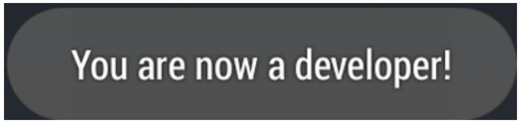
Software version
D85010d

Kernel version
3.4.0-g56241fd
root@abm033 #1
SMP PREEMPT

Baseband version
1.05.20.0321_2

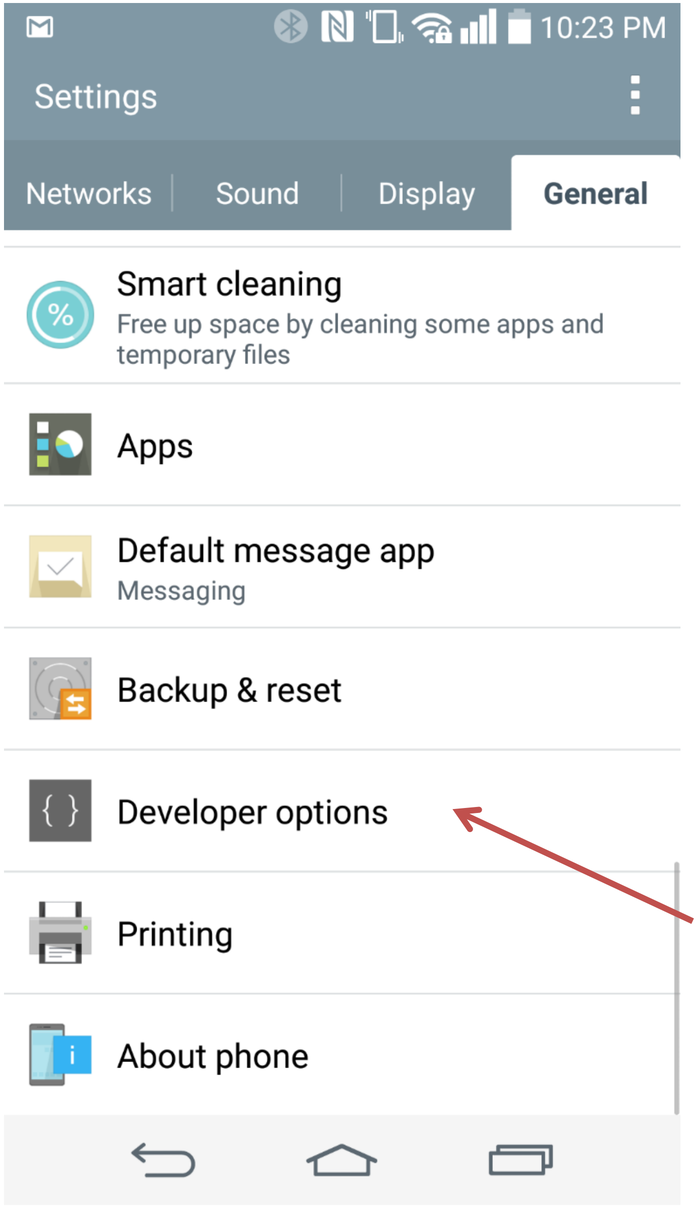
Build number
1.54.654.9 CL325648 release-keys

tab 7 times ⇨



You are now a developer!

Enable “USB debugging” in Your Phone



10:23 PM

Settings

Networks | Sound | Display | **General**

Smart cleaning
Free up space by cleaning some apps and temporary files

Apps

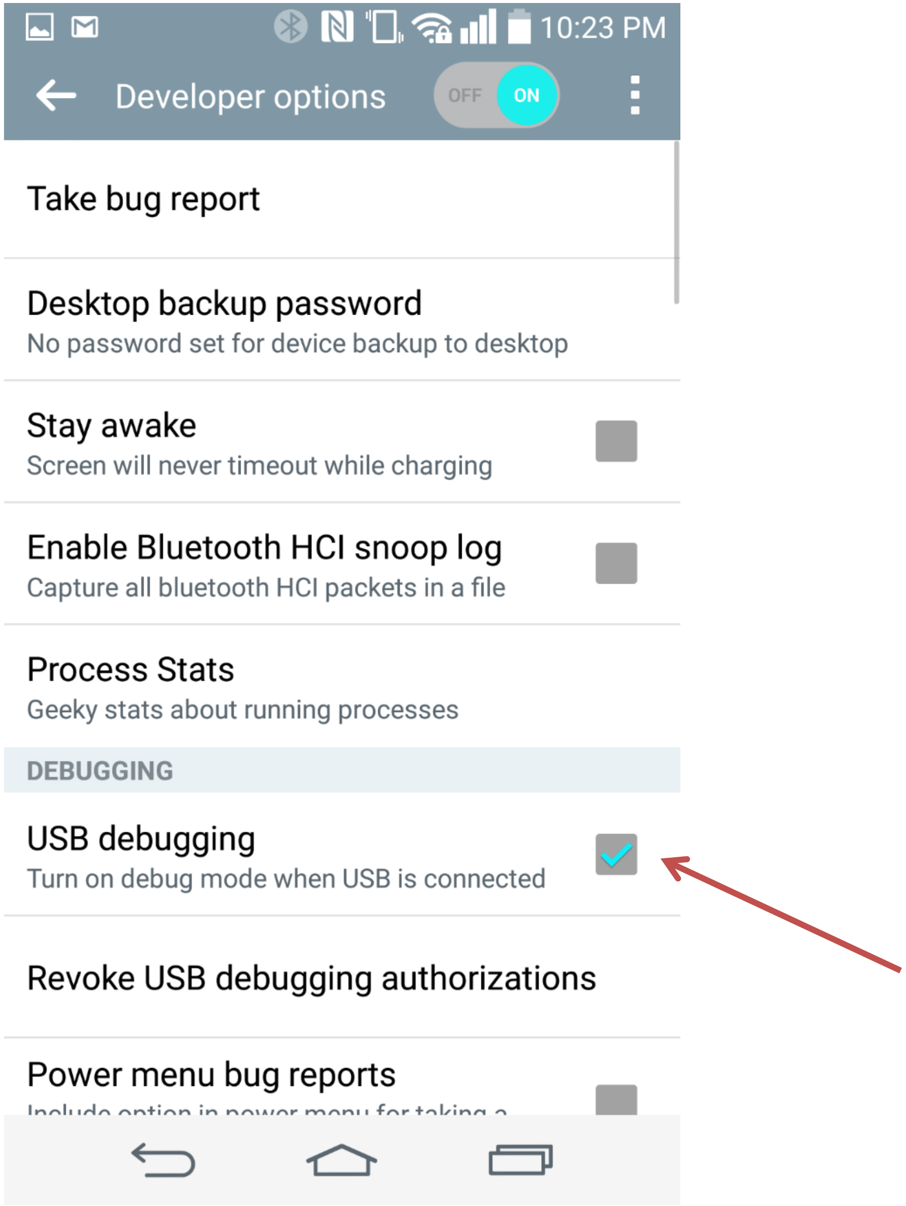
Default message app
Messaging

Backup & reset

Developer options

Printing

About phone



10:23 PM

Developer options OFF ON

Take bug report

Desktop backup password
No password set for device backup to desktop

Stay awake □
Screen will never timeout while charging

Enable Bluetooth HCI snoop log □
Capture all bluetooth HCI packets in a file

Process Stats
Geeky stats about running processes

DEBUGGING

USB debugging ☑
Turn on debug mode when USB is connected

Revoke USB debugging authorizations

Power menu bug reports □
Include option in power menu for taking a

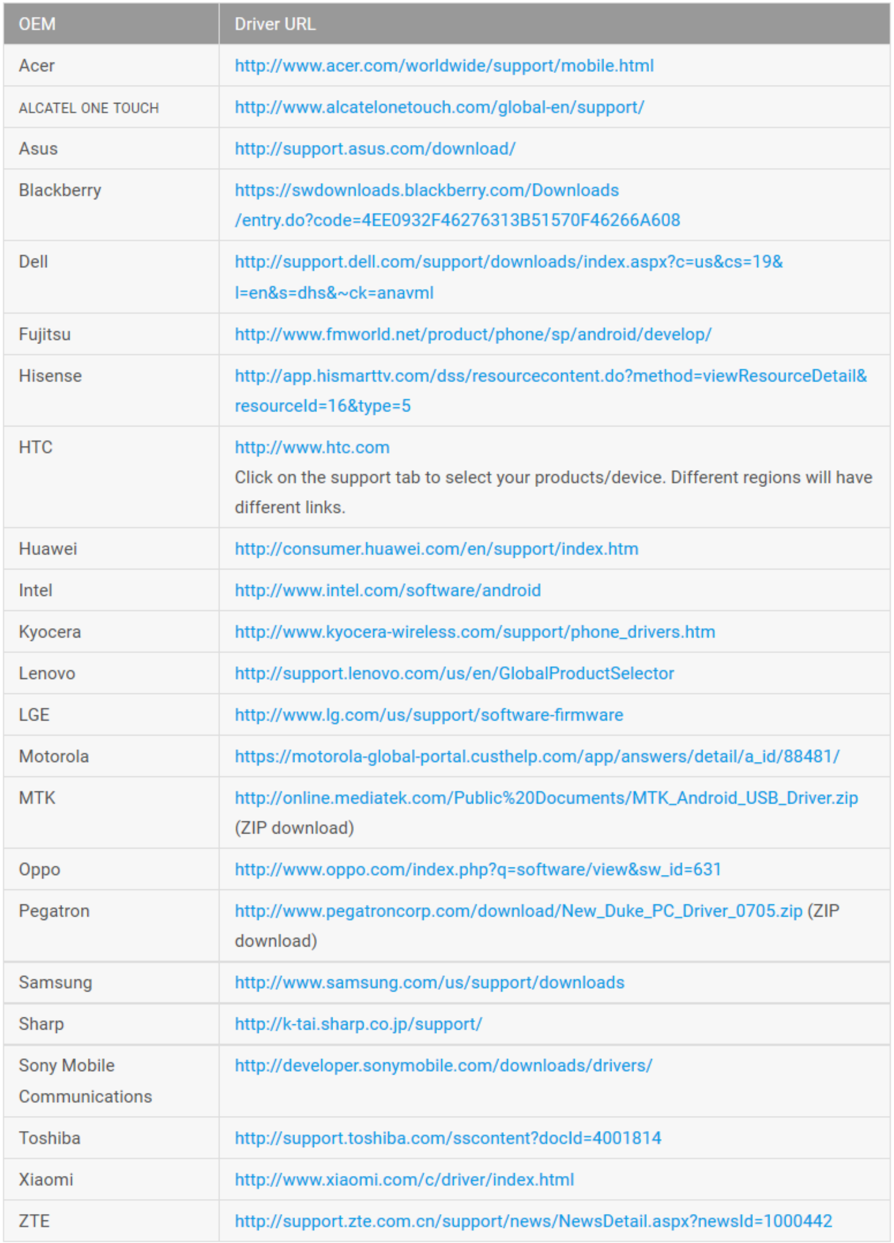
Find & Install USB driver for your phone

- Google Nexus Serious except Galaxy Nexus
  - Install Google USB driver
    http://developer.android.com/sdk/win-usb.html#download

- Samsung
  - Download & install ADB driver
    http://developer.samsung.com/android/tools-sdks/Samsung-Andorid-USB-Driver-for-Windows

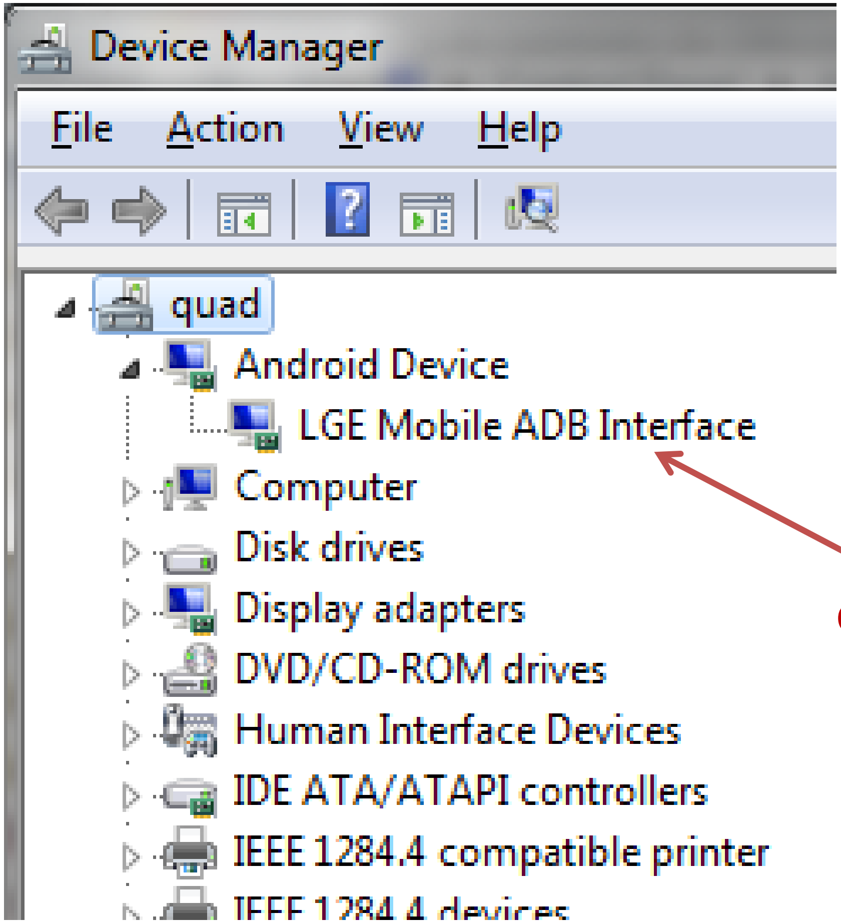
Find & Install USB driver for your phone

- http://developer.android.com/tools/extras/oem-usb.html



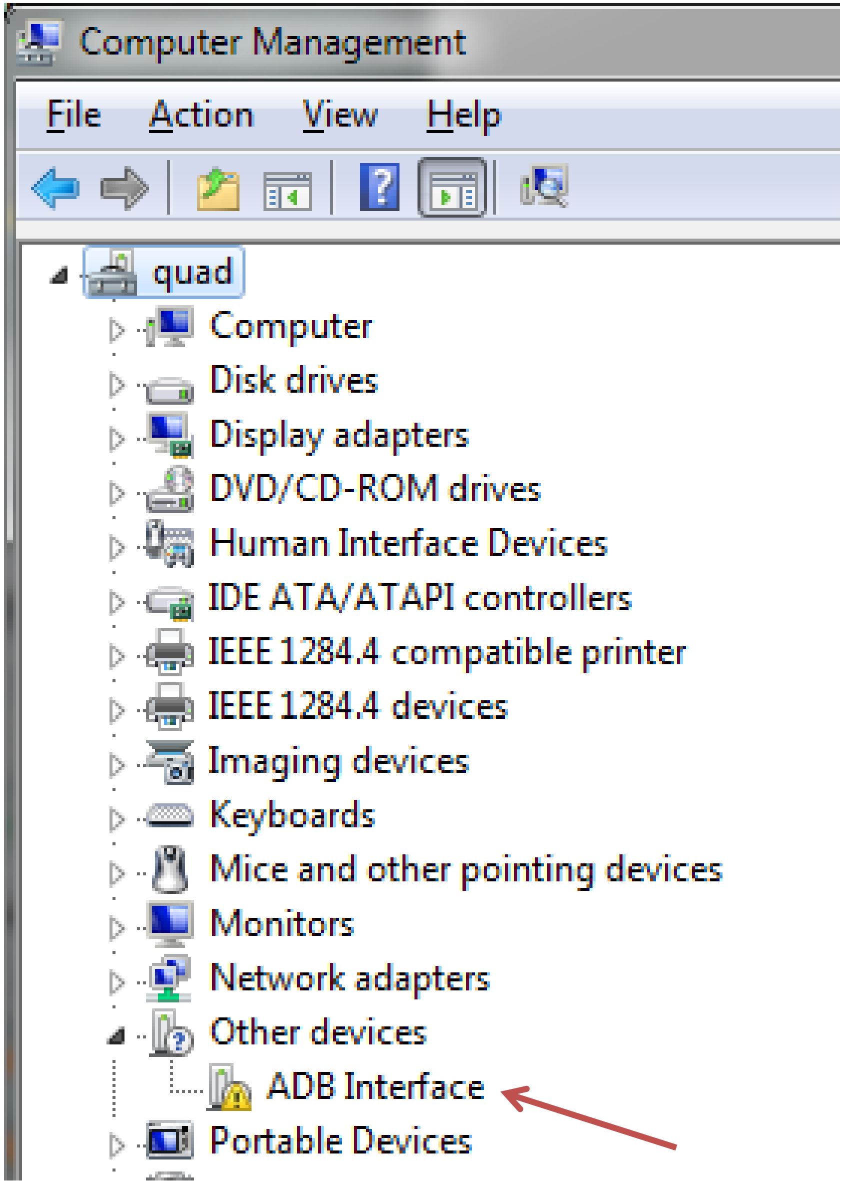
OEM	Driver URL
Acer	http://www.acer.com/worldwide/support/mobile.html
ALCATEL ONE TOUCH	http://www.alcatelonetouch.com/global-en/support/
Asus	http://support.asus.com/download/
Blackberry	https://swdownloads.blackberry.com/Downloads/entry.do?code=4EE0932F46276313B51570F46266A608
Dell	http://support.dell.com/support/downloads/index.aspx?c=us&cs=19&l=en&s=dhs&~ck=anavml
Fujitsu	http://www.fmworld.net/product/phone/sp/android/develop/
Hisense	http://app.hismarttv.com/dss/resourcecontent.do?method=viewResourceDetail&resourceId=16&type=5
HTC	http://www.htc.com Click on the support tab to select your products/device. Different regions will have different links.
Huawei	http://consumer.huawei.com/en/support/index.htm
Intel	http://www.intel.com/software/android
Kyocera	http://www.kyocera-wireless.com/support/phone_drivers.htm
Lenovo	http://support.lenovo.com/us/en/GlobalProductSelector
LGE	http://www.lg.com/us/support/software-firmware
Motorola	https://motorola-global-portal.custhelp.com/app/answers/detail/a_id/88481/
MTK	http://online.mediatek.com/Public%20Documents/MTK_Android_USB_Driver.zip (ZIP download)
Oppo	http://www.oppo.com/index.php?q=software/view&sw_id=631
Pegatron	http://www.pegatroncorp.com/download/New_Duke_PC_Driver_0705.zip (ZIP download)
Samsung	http://www.samsung.com/us/support/downloads
Sharp	http://k-tai.sharp.co.jp/support/
Sony Mobile Communications	http://developer.sonymobile.com/downloads/drivers/
Toshiba	http://support.toshiba.com/sscontent?docId=4001814
Xiaomi	http://www.xiaomi.com/c/driver/index.html
ZTE	http://support.zte.com.cn/support/news/NewsDetail.aspx?newsId=1000442

You should see your phone in Device Manager



- quad
  - Android Device
    - LGE Mobile ADB Interface
  - Computer
  - Disk drives
  - Display adapters
  - DVD/CD-ROM drives
  - Human Interface Devices
  - IDE ATA/ATAPI controllers
  - IEEE 1284.4 compatible printer
  - IEEE 1284.4 devices

OK

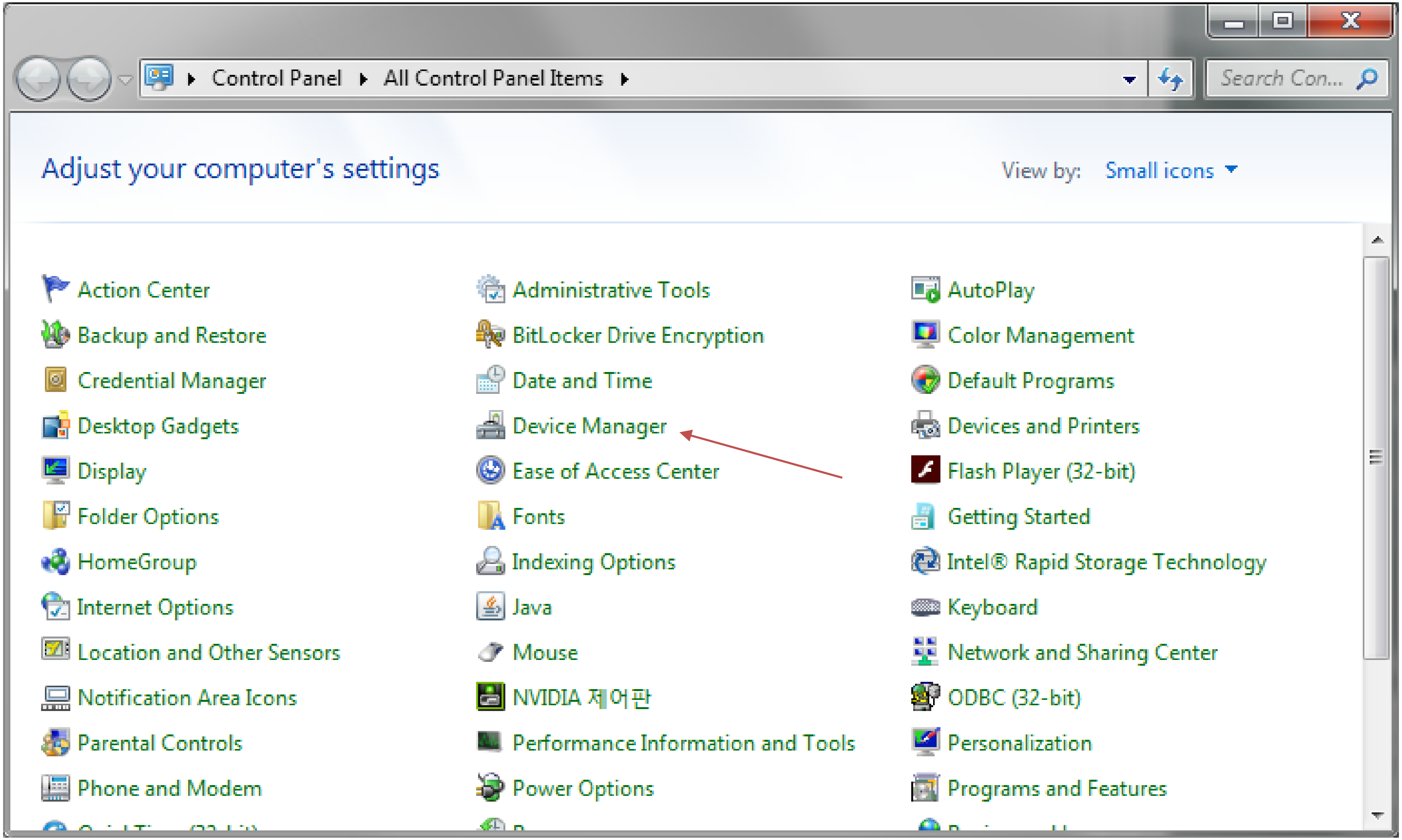


- quad
  - Computer
  - Disk drives
  - Display adapters
  - DVD/CD-ROM drives
  - Human Interface Devices
  - IDE ATA/ATAPI controllers
  - IEEE 1284.4 compatible printer
  - IEEE 1284.4 devices
  - Imaging devices
  - Keyboards
  - Mice and other pointing devices
  - Monitors
  - Network adapters
  - Other devices
    - ADB Interface
  - Portable Devices

No driver yet

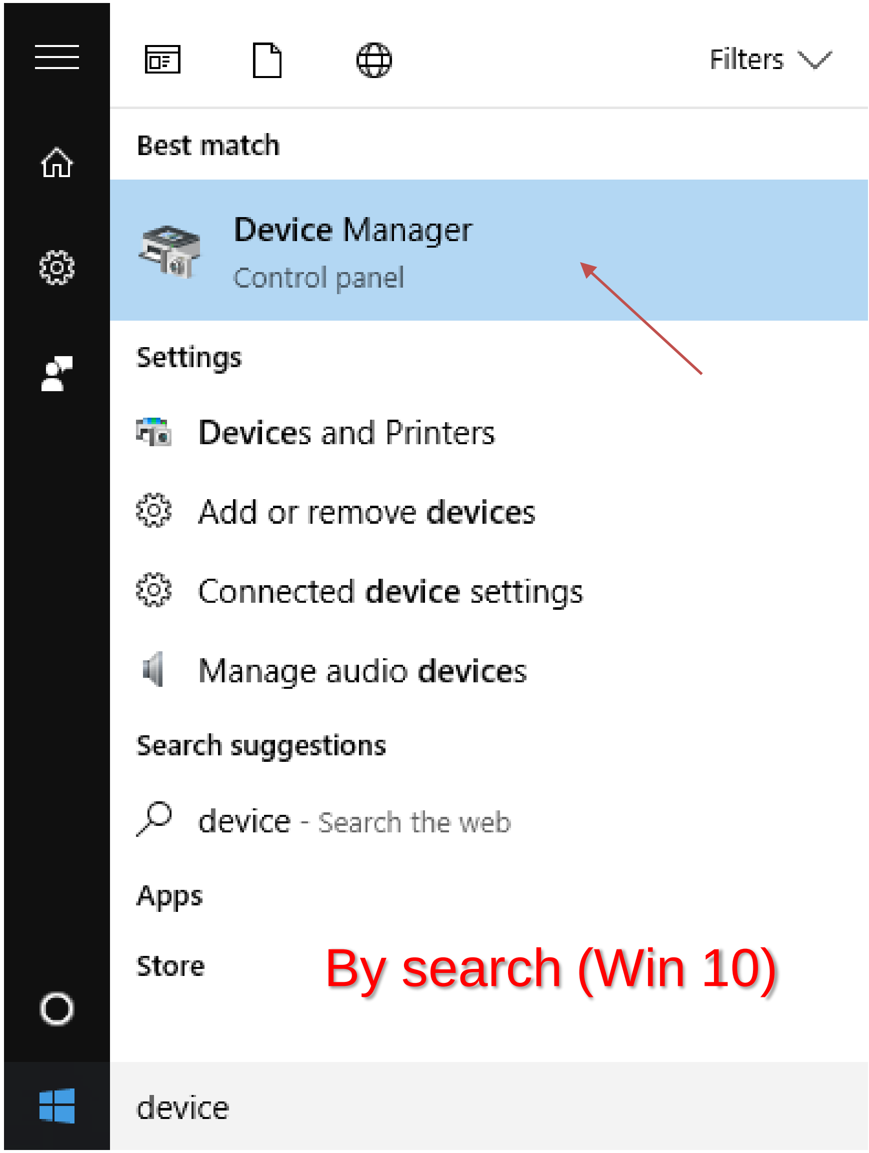
How to open device manager

From control panel (Win 7)



View by: Small icons

How to open device manager



Filters

Best match

Device Manager
Control panel

Settings

Devices and Printers

Add or remove devices

Connected device settings

Manage audio devices

Search suggestions

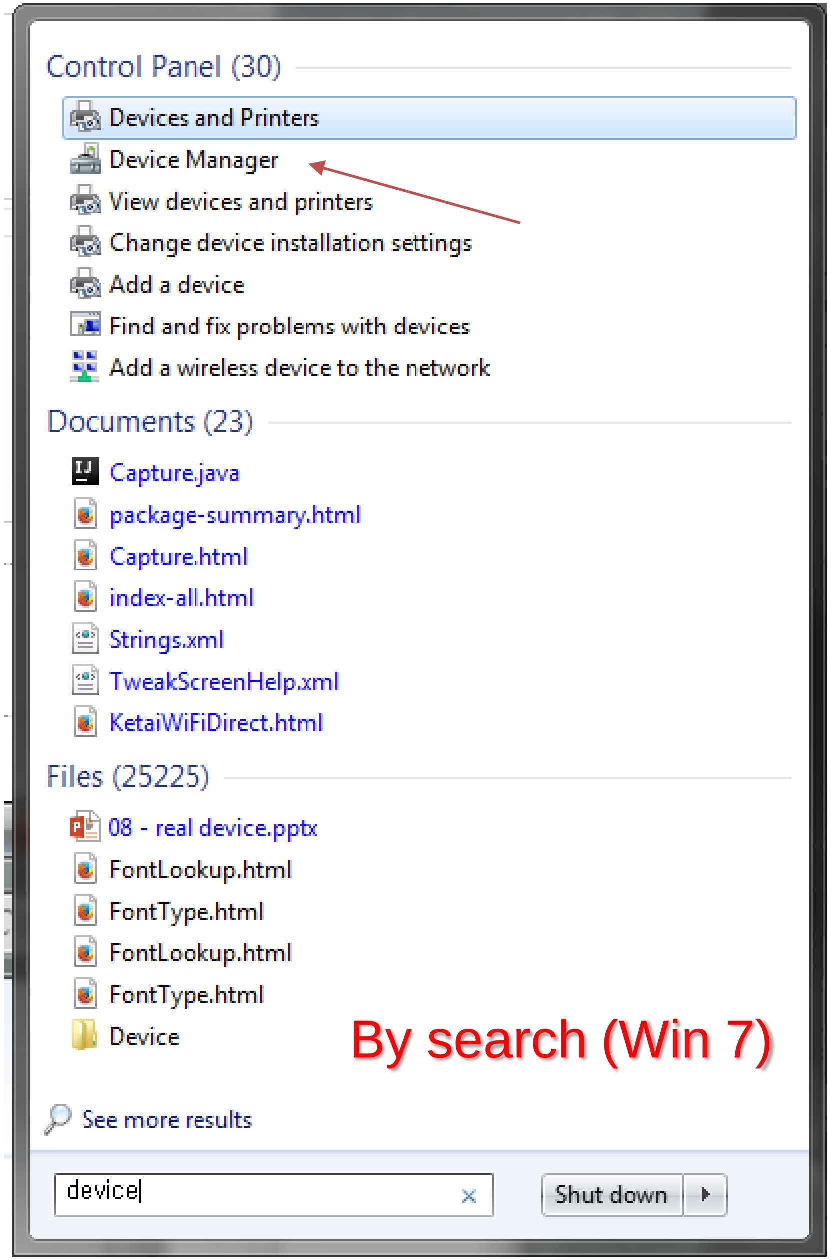
device - Search the web

Apps

Store

device

By search (Win 10)



Control Panel (30)

- Devices and Printers
- Device Manager
- View devices and printers
- Change device installation settings
- Add a device
- Find and fix problems with devices
- Add a wireless device to the network

Documents (23)

- Capture.java
- package-summary.html
- Capture.html
- index-all.html
- Strings.xml
- TweakScreenHelp.xml
- KetaiWiFiDirect.html

Files (25225)

- 08 - real device.pptx
- FontLookup.html
- FontType.html
- FontLookup.html
- FontType.html
- Device

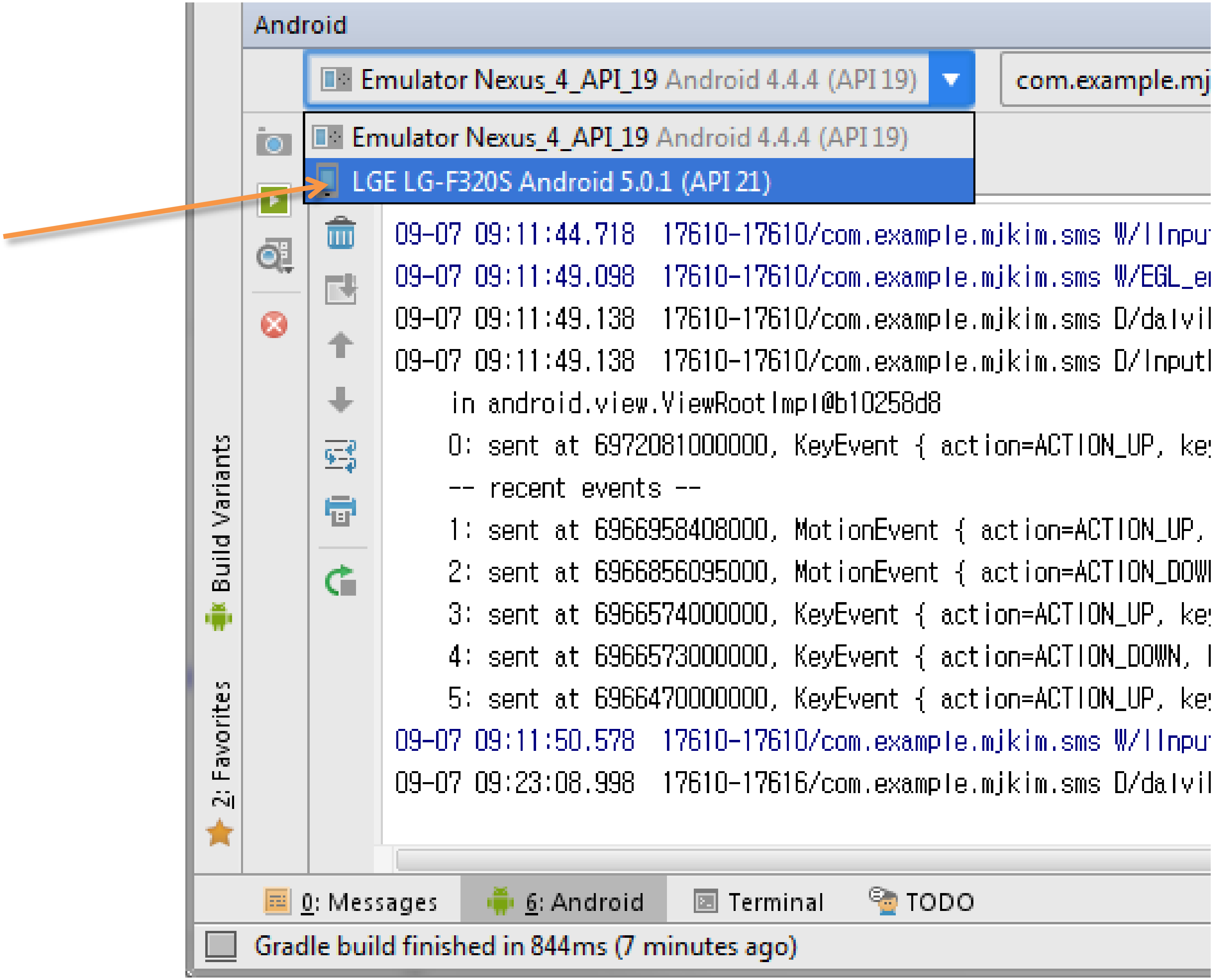
See more results

device

Shut down

By search (Win 7)

Finally you can see your phone in A-Studio



Emulator Nexus_4_API_19 Android 4.4.4 (API 19)

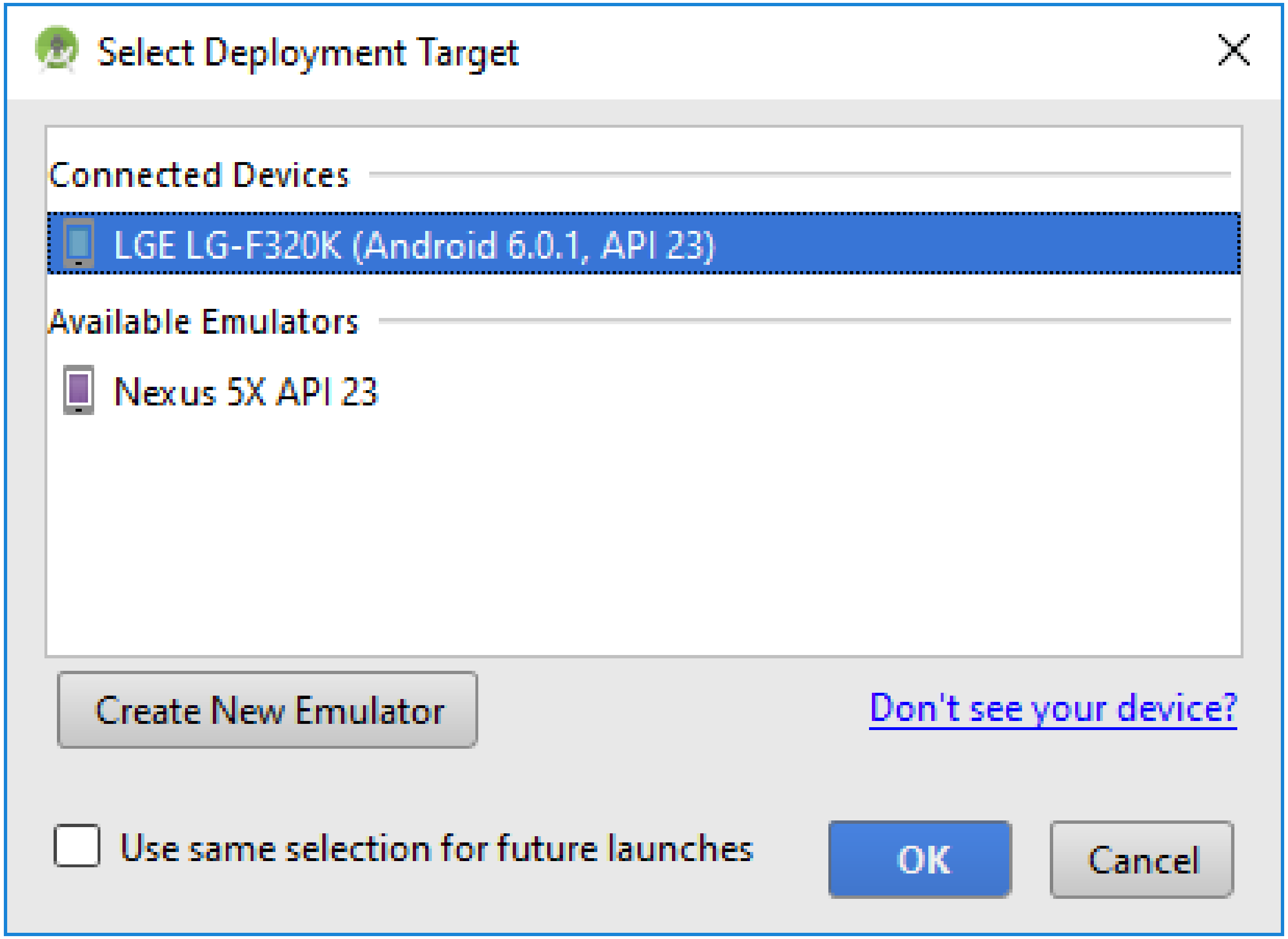
Emulator Nexus_4_API_19 Android 4.4.4 (API 19)

LGE LG-F320S Android 5.0.1 (API 21)

```
09-07 09:11:44.718  17610-17610/com.example.mjkim.sms W/IInpu
09-07 09:11:49.098  17610-17610/com.example.mjkim.sms W/EGL_e
09-07 09:11:49.138  17610-17610/com.example.mjkim.sms D/dalvi
09-07 09:11:49.138  17610-17610/com.example.mjkim.sms D/Input
    in android.view.ViewRootImpl@b10258d8
    0: sent at 6972081000000, KeyEvent { action=ACTION_UP, ke
    -- recent events --
    1: sent at 6966958408000, MotionEvent { action=ACTION_UP,
    2: sent at 6966856095000, MotionEvent { action=ACTION_DOW
    3: sent at 6966574000000, KeyEvent { action=ACTION_UP, ke
    4: sent at 6966573000000, KeyEvent { action=ACTION_DOWN, 
    5: sent at 6966470000000, KeyEvent { action=ACTION_UP, ke
09-07 09:11:50.578  17610-17610/com.example.mjkim.sms W/IInpu
09-07 09:23:08.998  17610-17616/com.example.mjkim.sms D/dalvi
```

Gradle build finished in 844ms (7 minutes ago)

Finally you can see your phone in A-Studio



Select Deployment Target

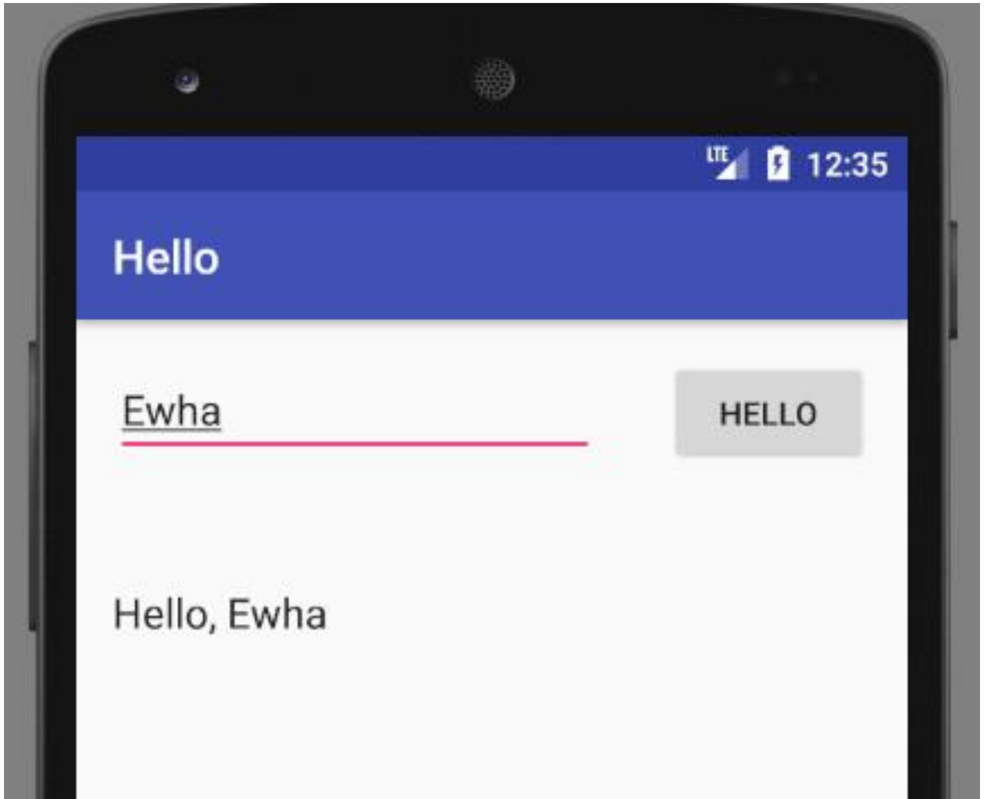
Connected Devices

LGE LG-F320K (Android 6.0.1, API 23)

Available Emulators

Nexus 5X API 23

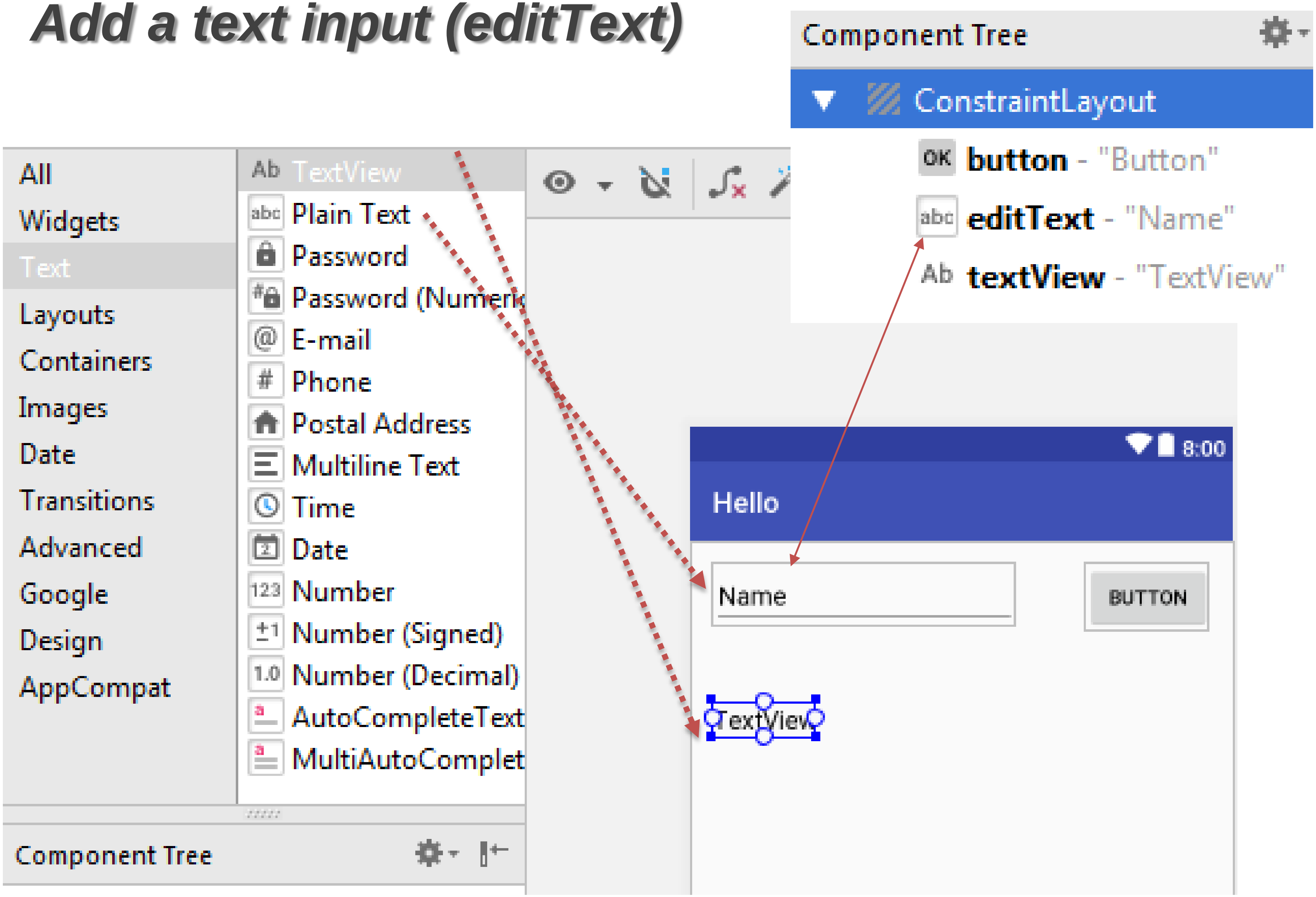
Hello, ‘your name’



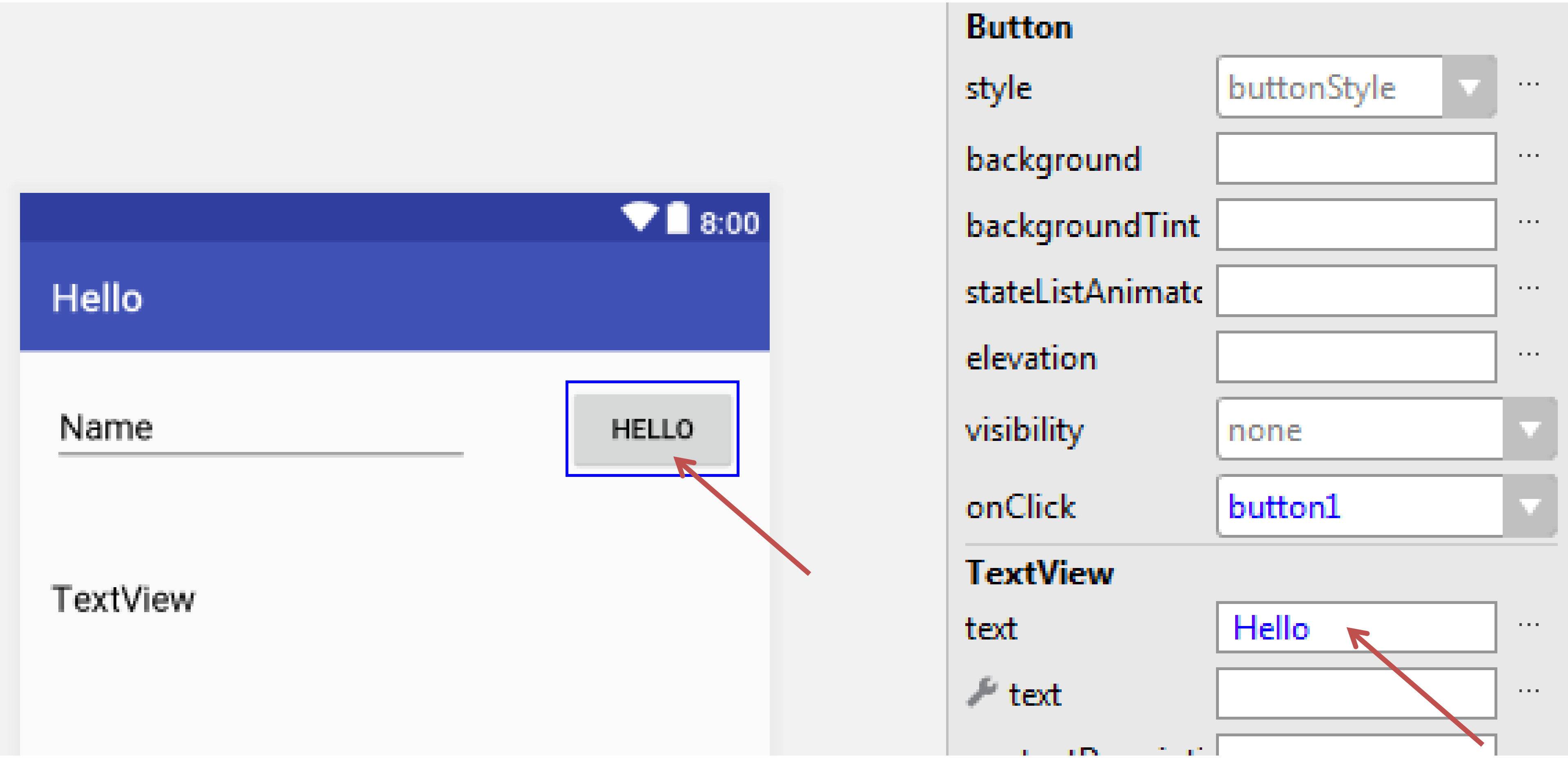
Ewha

Hello, Ewha

Add a text input (editText)



Change button text



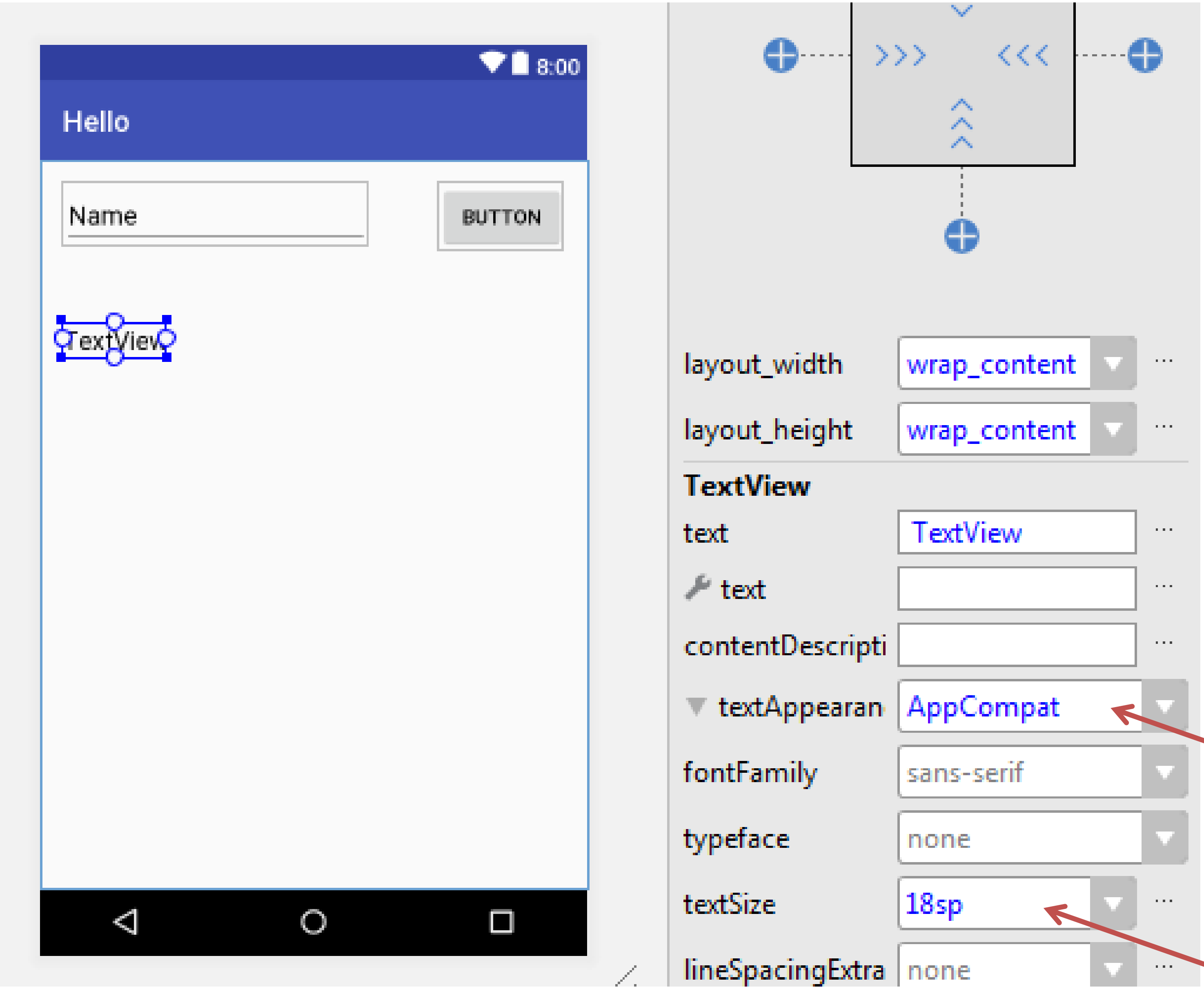
Button

style	buttonStyle
background	
backgroundTint	
stateListAnimatc	
elevation	
visibility	none
onClick	button1

TextView

text	Hello
text	

Change text appearance



layout_width: wrap_content

layout_height: wrap_content

TextView

text: TextView

text:

contentDescripti:

textAppearan: AppCompat

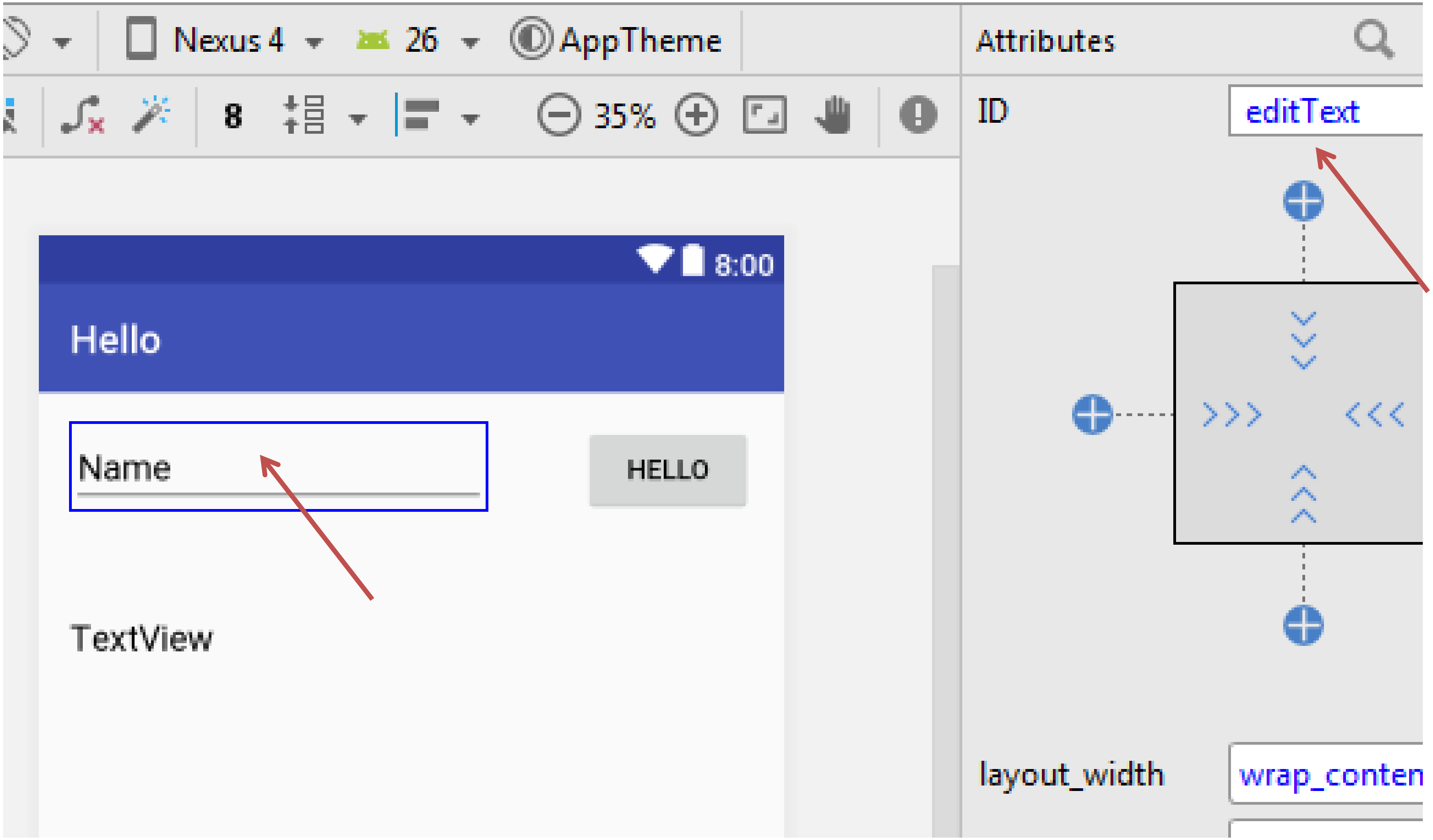
fontFamily: sans-serif

typeface: none

textSize: 18sp

lineSpacingExtra: none

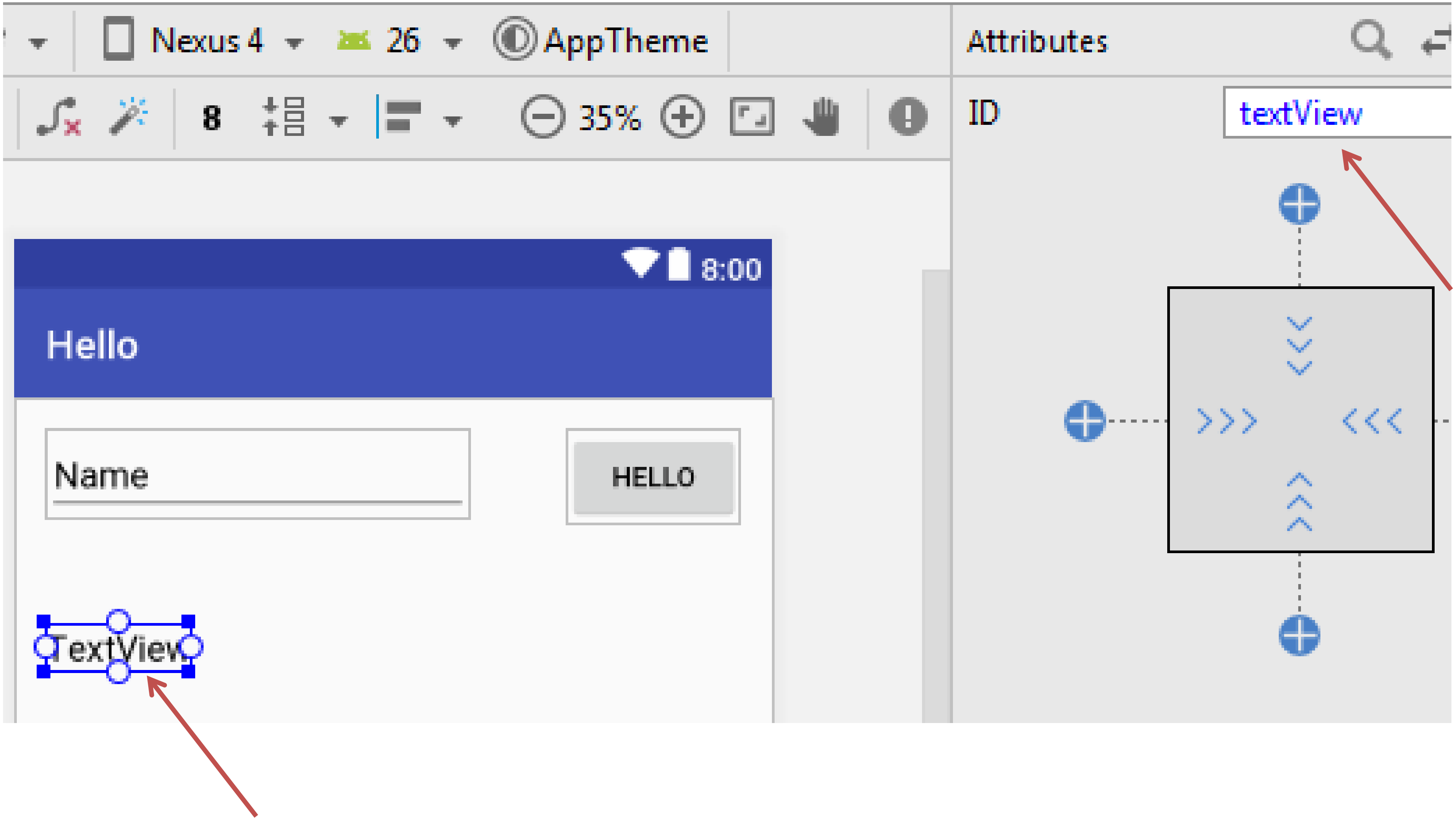
Check IDs



ID editText

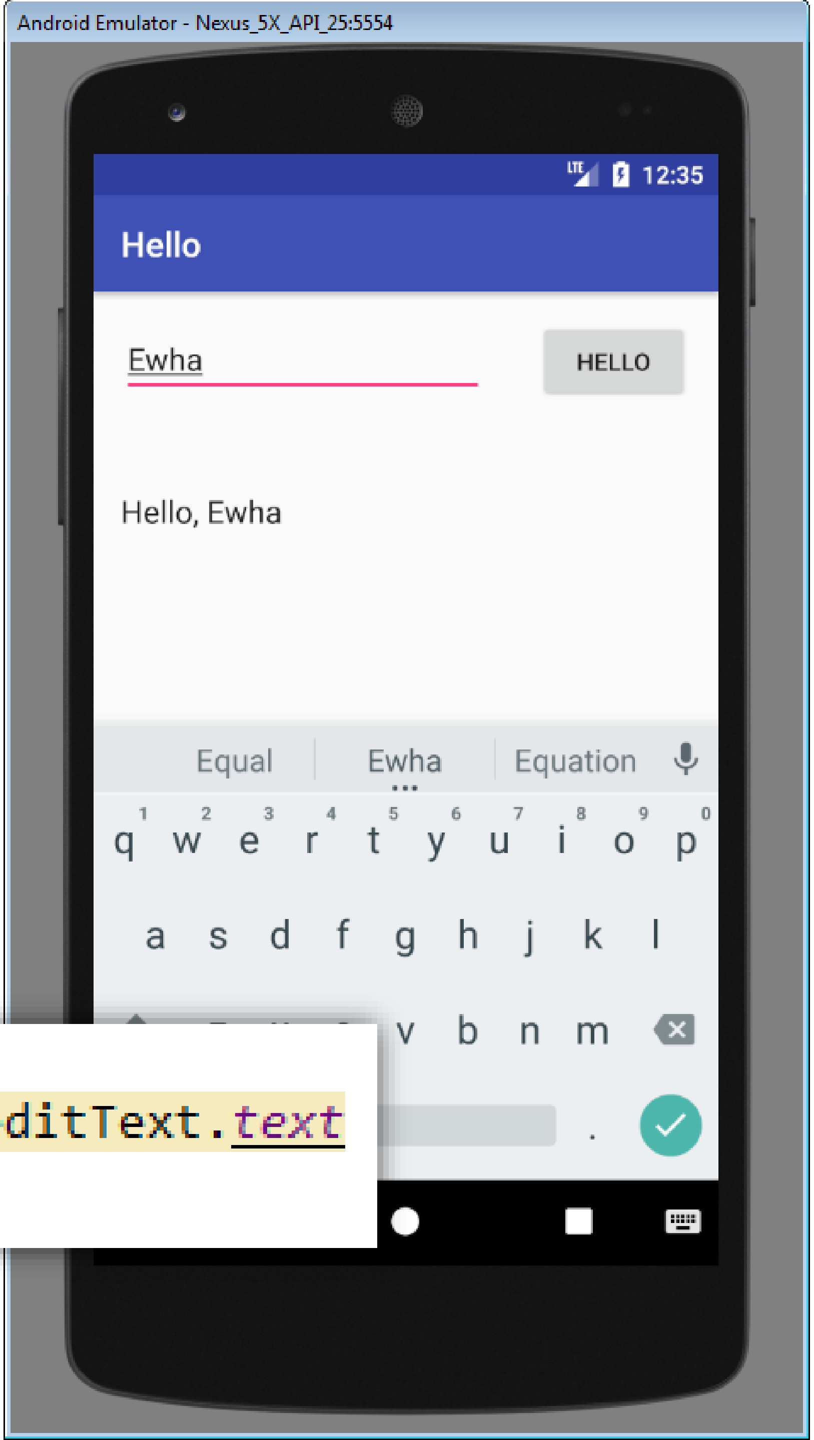
layout_width wrap_conten

Check IDs



ID textView

Kotlin code



Ewha

Hello, Ewha

```kotlin
fun button1(view : View) {
    textView.text = "Hello, " + editText.text
}
```