Enfoques de desarrollo de Aplicaciones Móviles

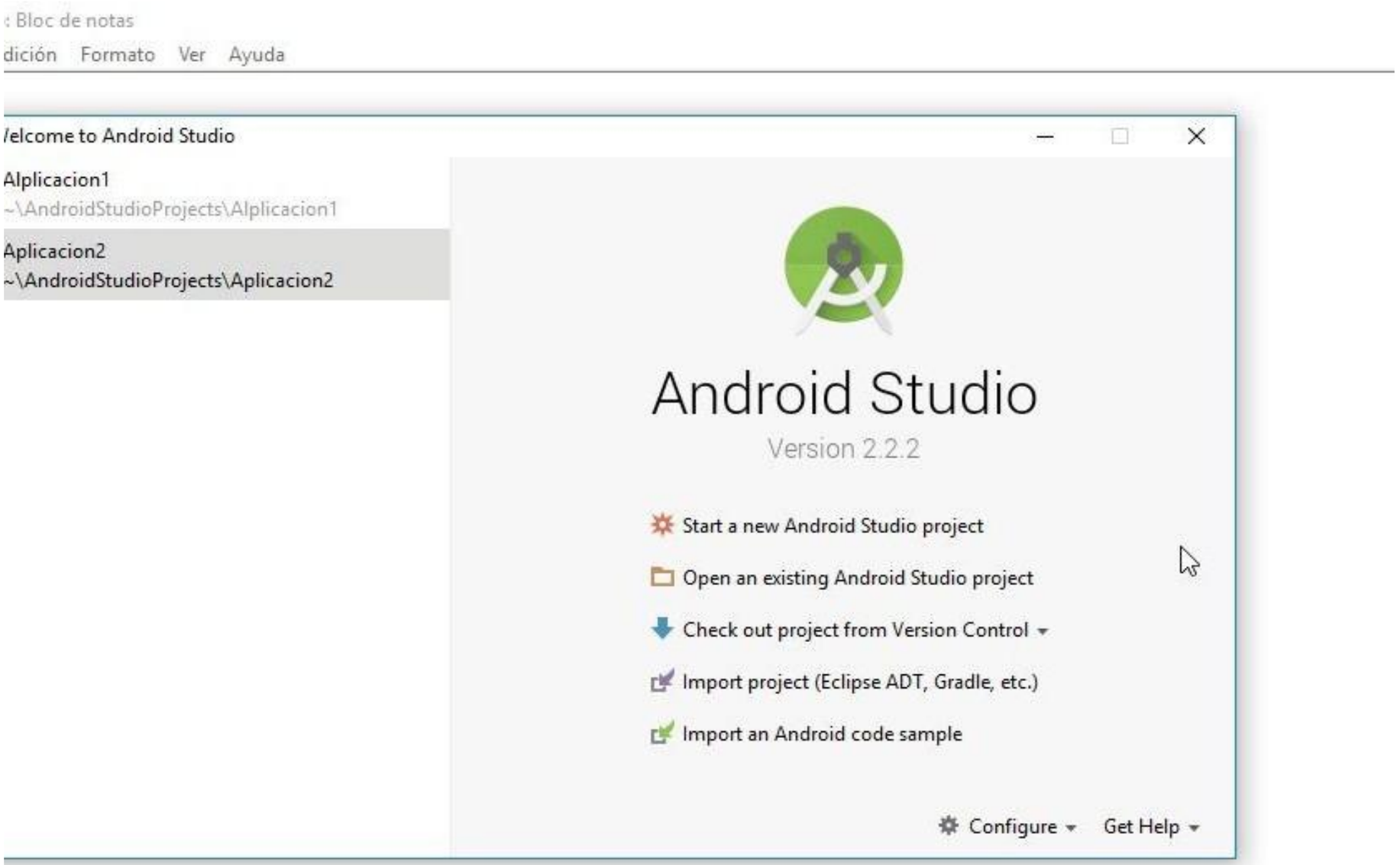
Aplicaciones Nativas con Android

Primeros pasos con Android

Android Studio es un IDE para la plataforma Android y reemplazó a Eclipse como el IDE oficial para el desarrollo de aplicaciones para Android. La primera versión estable fue publicada en diciembre de 2014.

Instrucciones sobre descarga e instalación en:
https://developer.android.com/studio/index.html

Hacer clic en ***Configure*** / ***SDK Manager***



Hacer clic en ***Configure*** / ***SDK Manager***

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: C:\Users\leona\AppData\Local\Android\Sdk Edit

SDK Platforms | SDK Tools | SDK Update Sites

Each Android SDK Platform package includes the Android platform and sources pertaining to an API level by default. Once installed, Android Studio will automatically check for updates. Check "show package details" to display individual SDK components.

Name	API Level	Revision	Status
Android 7.1.1 (Nougat)	25	1	Not installed
Android 7.0 (Nougat)	24	2	Installed
Android 6.0 (Marshmallow)	23	3	Partially installed
Android 5.1 (Lollipop)	22	2	Partially installed
Android 5.0 (Lollipop)	21	2	Not installed
Android 4.4W (KitKat Wear)	20	2	Not installed
Android 4.4 (KitKat)	19	4	Not installed
Android 4.3 (Jelly Bean)	18	3	Not installed
Android 4.2 (Jelly Bean)	17	3	Not installed
Android 4.1 (Jelly Bean)	16	5	Not installed
Android 4.0.3 (IceCreamSandwich)	15	5	Not installed
Android 4.0 (IceCreamSandwich)	14	4	Not installed
Android 3.2 (Honeycomb)	13	1	Not installed
Android 3.1 (Honeycomb)	12	3	Not installed
Android 3.0 (Honeycomb)	11	2	Not installed
Android 2.3.3 (Gingerbread)	10	2	Not installed
Android 2.3 (Gingerbread)	9	2	Not installed
Android 2.2 (Froyo)	8	3	Not installed
Android 2.1 (Eclair)	7	3	Not installed

Show Package Details

Android 7.0 instalado
Android 6.0 parcialmente instalado Android 5.1 parcialmente instalado

Apply Help

Hacer clic en ***Configure*** / ***SDK Manager***

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Android 4.2 (Jelly Bean)	17	3	Not installed
Android 4.1 (Jelly Bean)	16	5	Not installed
Android 4.0.3 (IceCreamSandwich)	15	5	Not installed
Android 4.0 (IceCreamSandwich)	14	4	Not installed
Android 3.2 (Honeycomb)	13	1	Not installed
Android 3.1 (Honeycomb)	12	3	Not installed
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Android 2.1 (Eclair)	7	3	Not installed

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Looking for updates...

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Launch Standalone SDK Manager

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Android SDK Platform 24	24	2	Installed
Sources for Android 24	24	1	Installed
Android TV Intel x86 Atom System Image	24	7	Not installed
Android Wear ARM EABI v7a System Image	24	2	Not installed
Android Wear Intel x86 Atom System Image	24	2	Not installed
ARM 64 v8a System Image	24	7	Not installed
ARM EABI v7a System Image	24	7	Not installed
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Android TV ARM EABI v7a System Image	23	2	Not installed

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Se recomienda al menos instalar la plataforma y las fuentes del nivel API con el que se compilarán las aplicaciones

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Android 6.0 (Marshmallow)			
Google APIs			
Android SDK Platform 23	23	3	Installed
Sources for Android 23	23	1	Not installed
Android TV ARM EABI v7a System Image	23	3	Not installed

Opcionalmente puede instalar Google APIs para acceder a los servicios Google (map, sing-in, places,

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Todas estas imágenes pertenecen a dispositivos que podemos emular para correr y depurar las aplicaciones que desarrollemos

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Android 7.0 (Nougat)			
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Android SDK Platform 23	23	3	Installed
		1	Not installed
		3	Not installed

Show Package Details

Es conveniente emular dispositivos x86 para aprovechar el acelerador Haxm

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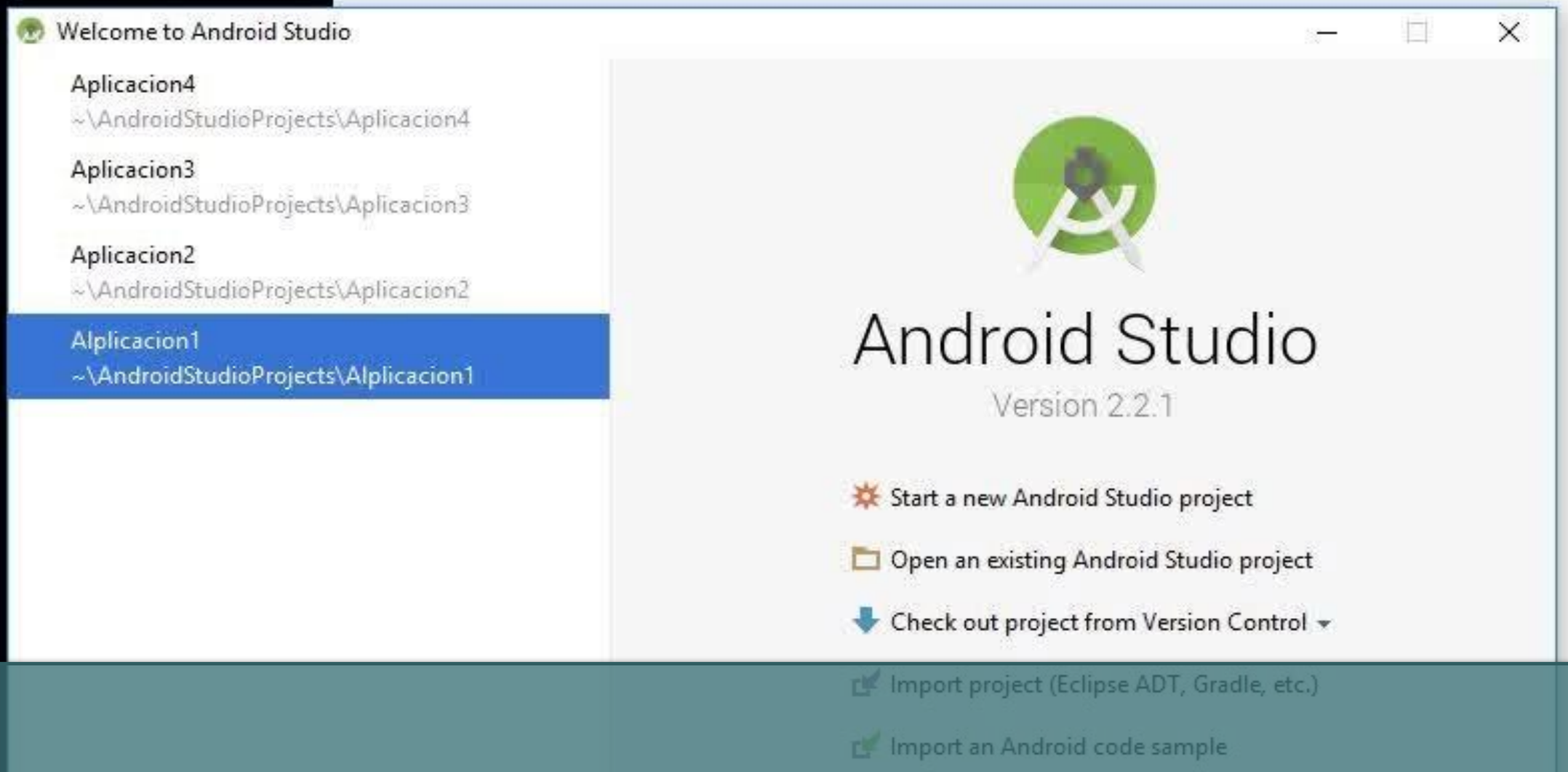
Show Package Details

Launch Standalone SDK Manager

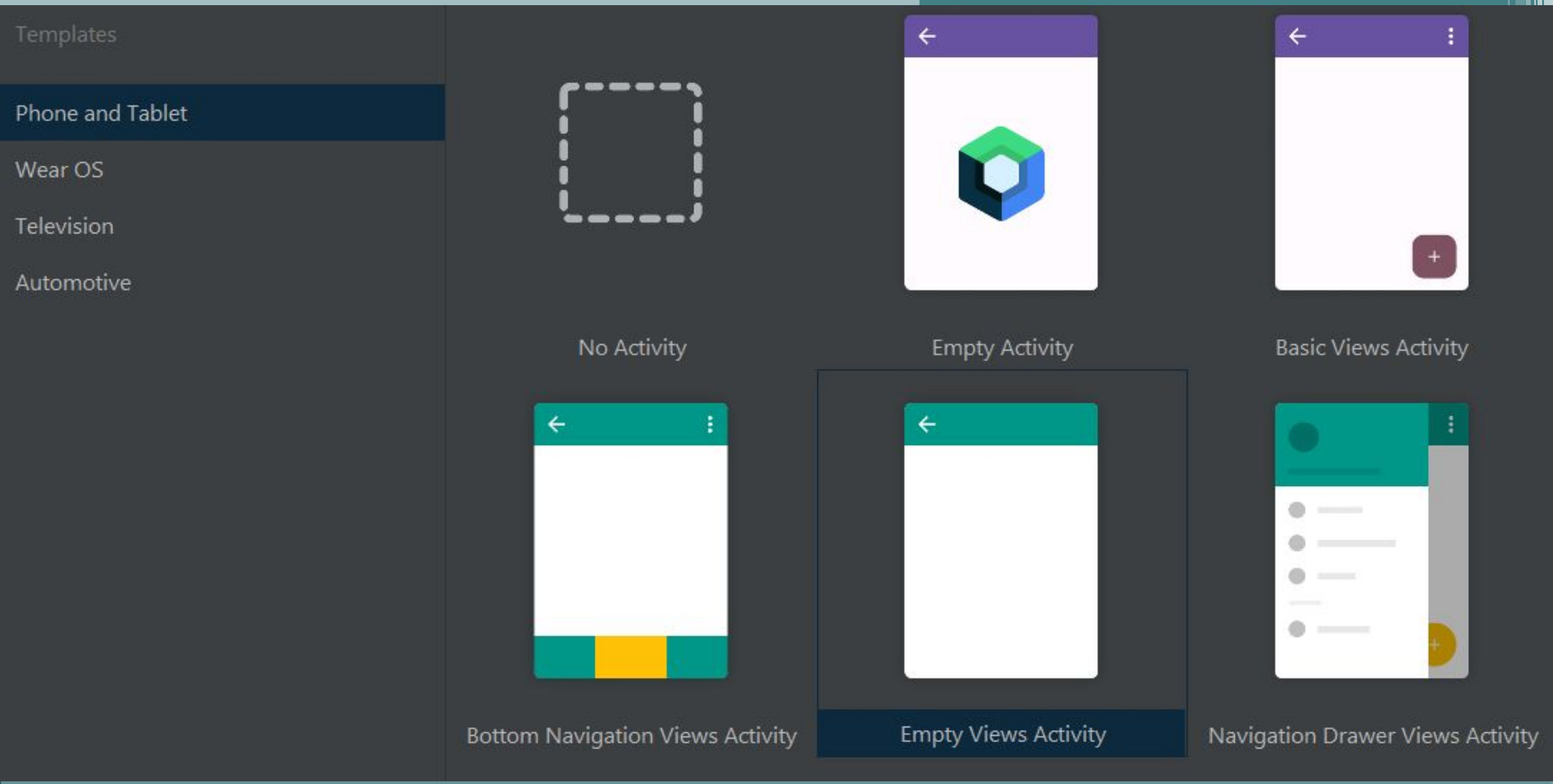
OK | Cancel | Apply | Help

Tener instalada la plataforma de la API 23, nos permite correr y depurar las aplicaciones que desarrollemos en un dispositivo con Android 6.0

Presionar en el botón



Hacer clic en ***Start a new Android Studio project*** y elegir el nombre de la aplicación



Seleccionar ***Phone and Tablet.***

En esta ventana elegir Empty Views Activity

Dejar el ***Activity Name .*** Seleccionar el lenguaje con el que desea desarrollar y la mínima versión SDK

Android Platform/API Version Distribution

ANDROID PLATFORM VERSION	API LEVEL	CUMULATIVE DISTRIBUTION
4.1 Jelly Bean	16	
4.2 Jelly Bean	17	99,9%
4.3 Jelly Bean	18	99,7%
4.4 KitKat	19	99,7%
5.0 Lollipop	21	98,8%
5.1 Lollipop	22	98,4%
6.0 Marshmallow	23	96,2%
7.0 Nougat	24	92,7%
7.1 Nougat	25	90,4%
8.0 Oreo	26	88,2%
8.1 Oreo	27	85,2%
9.0 Pie	28	77,3%
10. Q	29	62,8%
		40,5%

Marshmallow

Security
Fingerprint Authentication
Confirm Credential
System
App Linking
Adoptable Storage Devices
Multimedia
4K Display Mode
Support for MIDI
Create digital audio capture and playback objects
APIs to associate audio and input devices
List of all audio devices
Updated video processing APIs
Flashlight API
Reprocessing Camera2 API
Updated ImageWriter objects and Image Reader class
User Input
Voice Interactions
Assist API
Bluetooth Stylus Support
User Interface
Themeable ColorStateLists

Wireless & Connectivity
Hotspot 2.0
Improved Bluetooth Low Energy Scanning
Android for Work
Controls for Corporate-Owned, Single-Use devices
Silent install and uninstall of apps by Device Owner
Silent enterprise certificate access
Auto-acceptance of system updates
Delegated certificate installation
Data usage tracking
Runtime permission management
Work status notification

Last updated: August 4th, 2022

https://developer.android.com/about/versions/marshmallow/android-6.0.html

Cancel

Si se selecciona ***help me choose*** en la ventana anterior se despliega esta información que puede ayudarnos a elegir la versión mínima soportada por nuestra aplicación

Presiones en Finish

New Project

Empty Activity

Creates a new empty activity

Name: My Application

Package name: com.example.myapplication

Save location: C:\Users\Verena\AndroidStudioProjects\MyApplication3

Language: Kotlin

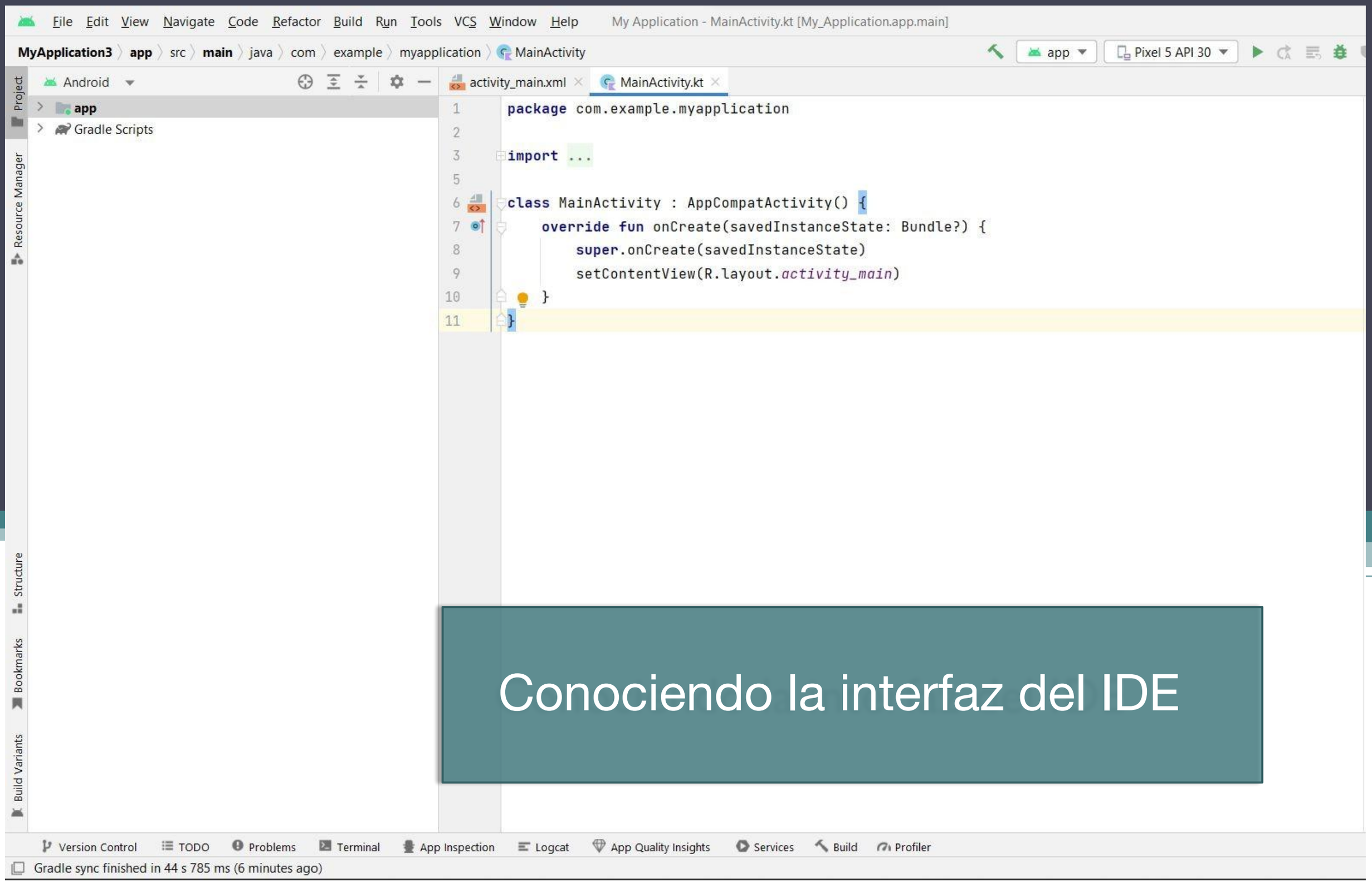
Minimum SDK: API 26: Android 8.0 (Oreo)

Your app will run on approximately **92,4%** of devices.
Help me choose

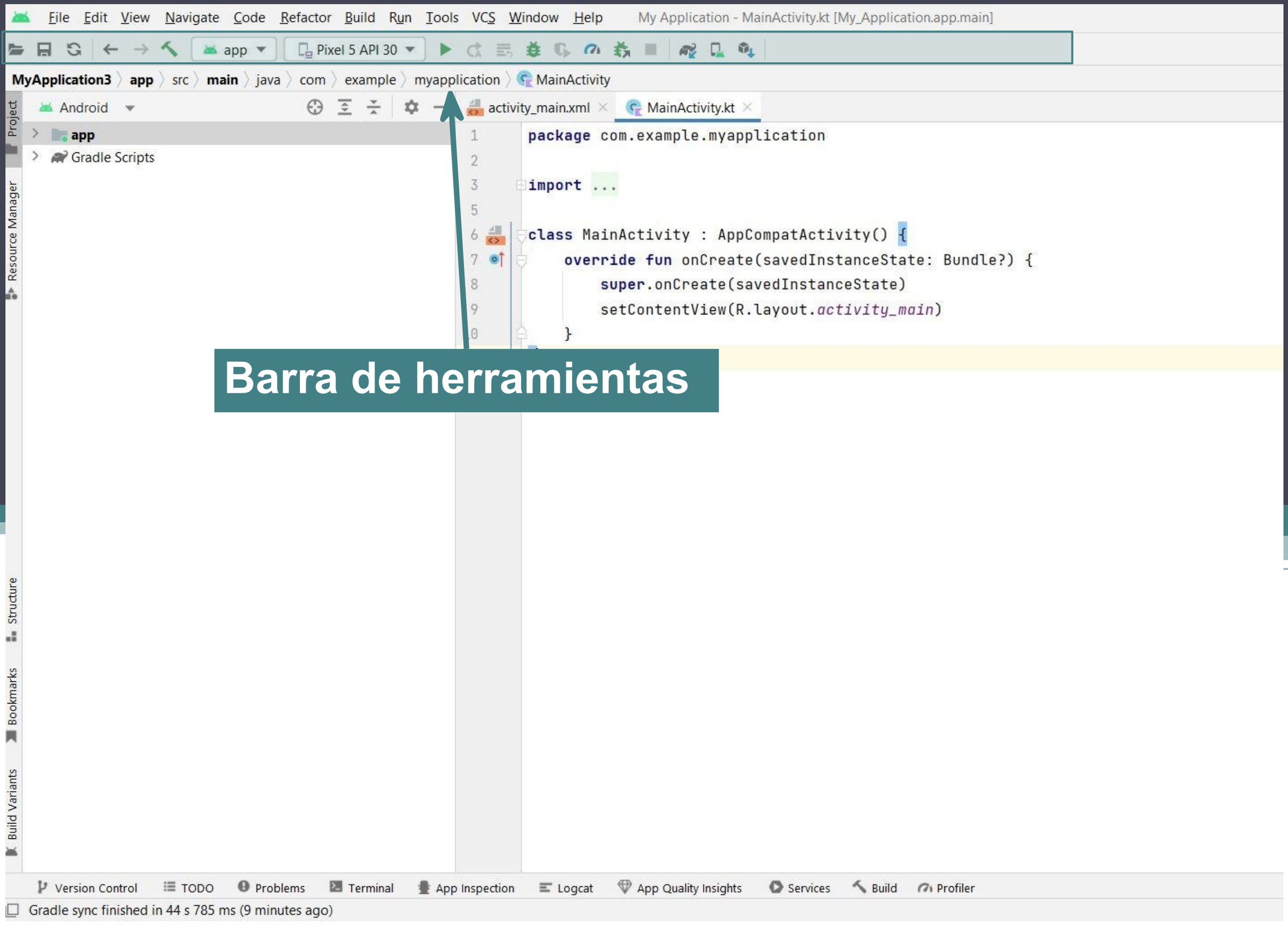
Use legacy android.support libraries

Using legacy android.support libraries will prevent you from using the latest Play Services and Jetpack libraries

Previous | Next | Cancel | Finish



Conociendo la interfaz del IDE


File Edit View Navigate Code Refactor Build Run Tools VCS Window Help
My Application - MainActivity.kt [My_Application.app.main]
app
Pixel 5 API 30
MyApplication3 app src main java com example myapplication MainActivity
Android
activity_main.xml
MainActivity.kt
app
Gradle Scripts
package com.example.myapplication
import ...
class MainActivity : AppCompatActivity() {
override fun onCreate(savedInstanceState: Bundle?) {
super.onCreate(savedInstanceState)
setContentView(R.layout.activity_main)
}
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Bookmarks
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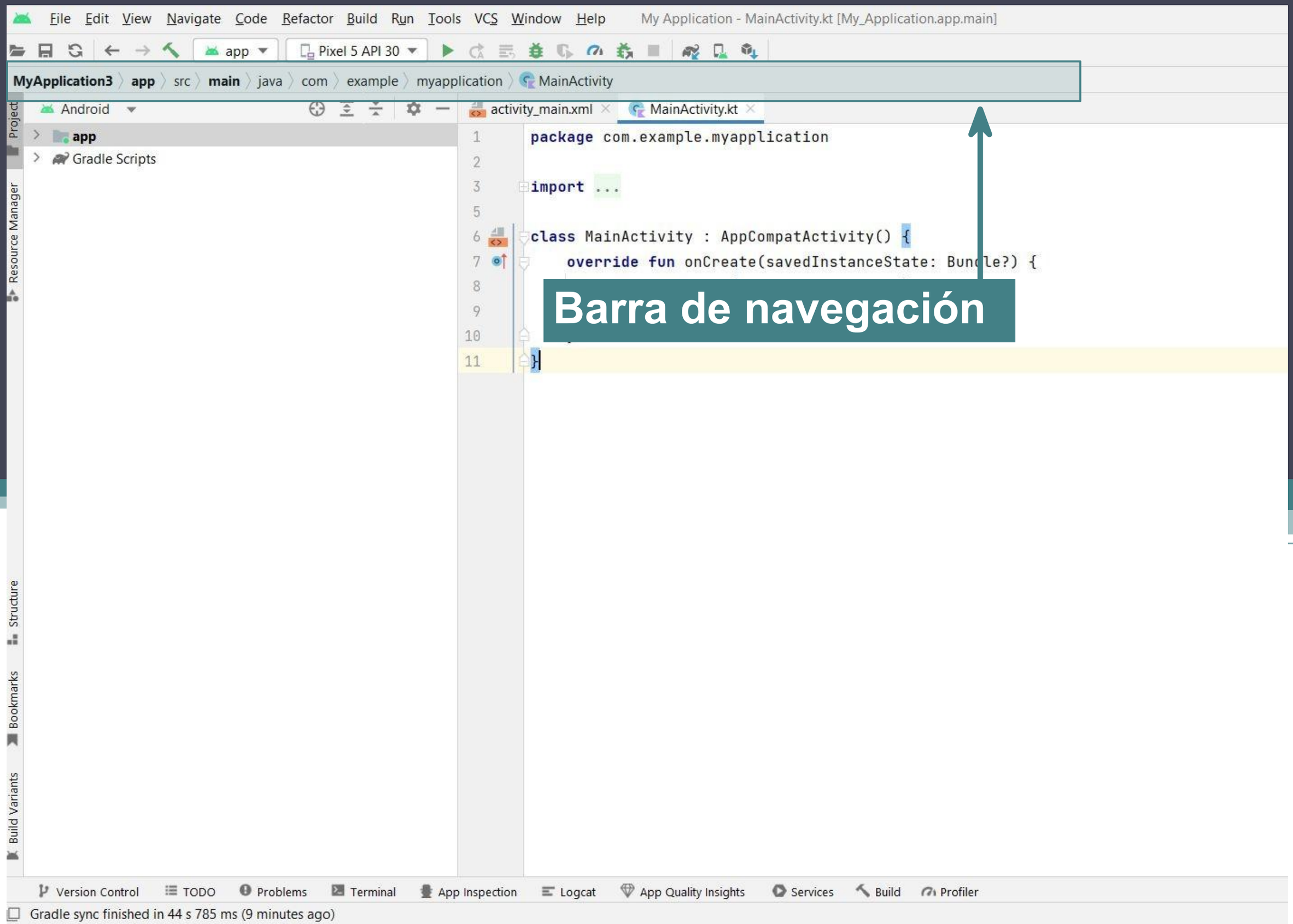
Version Control
TODO
Problems
Terminal
App Inspection
Logcat
App Quality Insights
Services
Build
Profiler
Gradle sync finished in 44 s 785 ms (9 minutes ago)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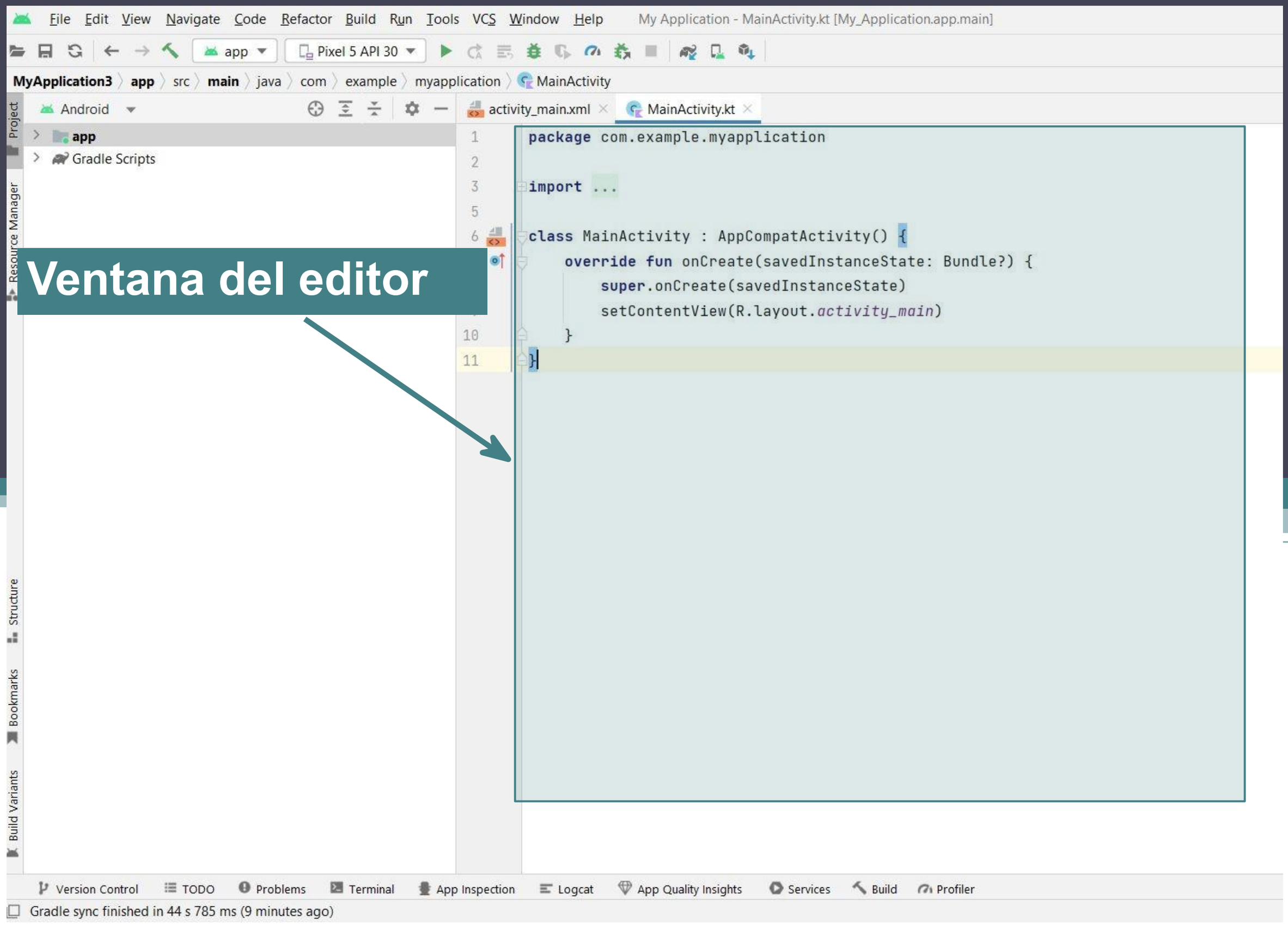
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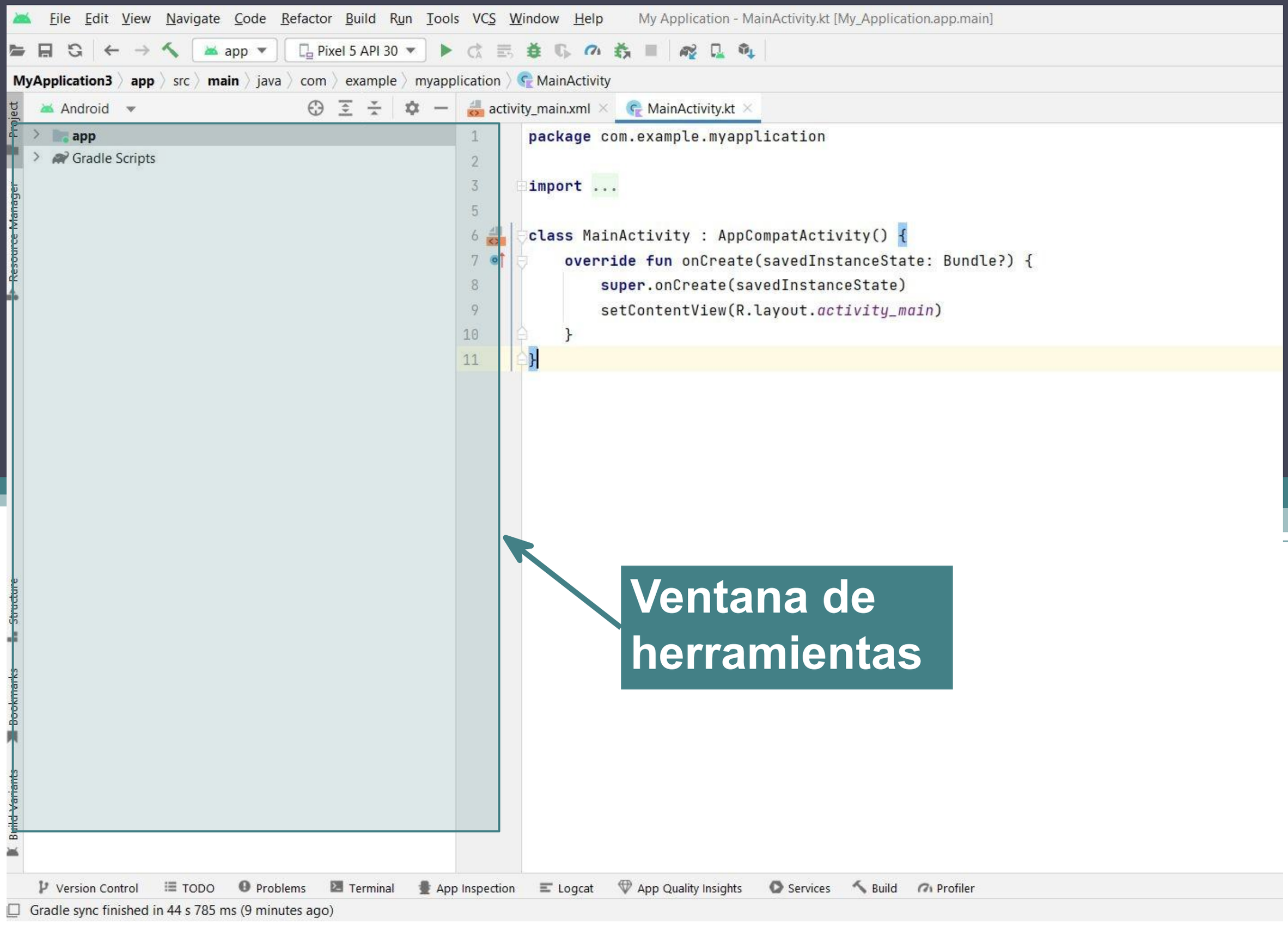
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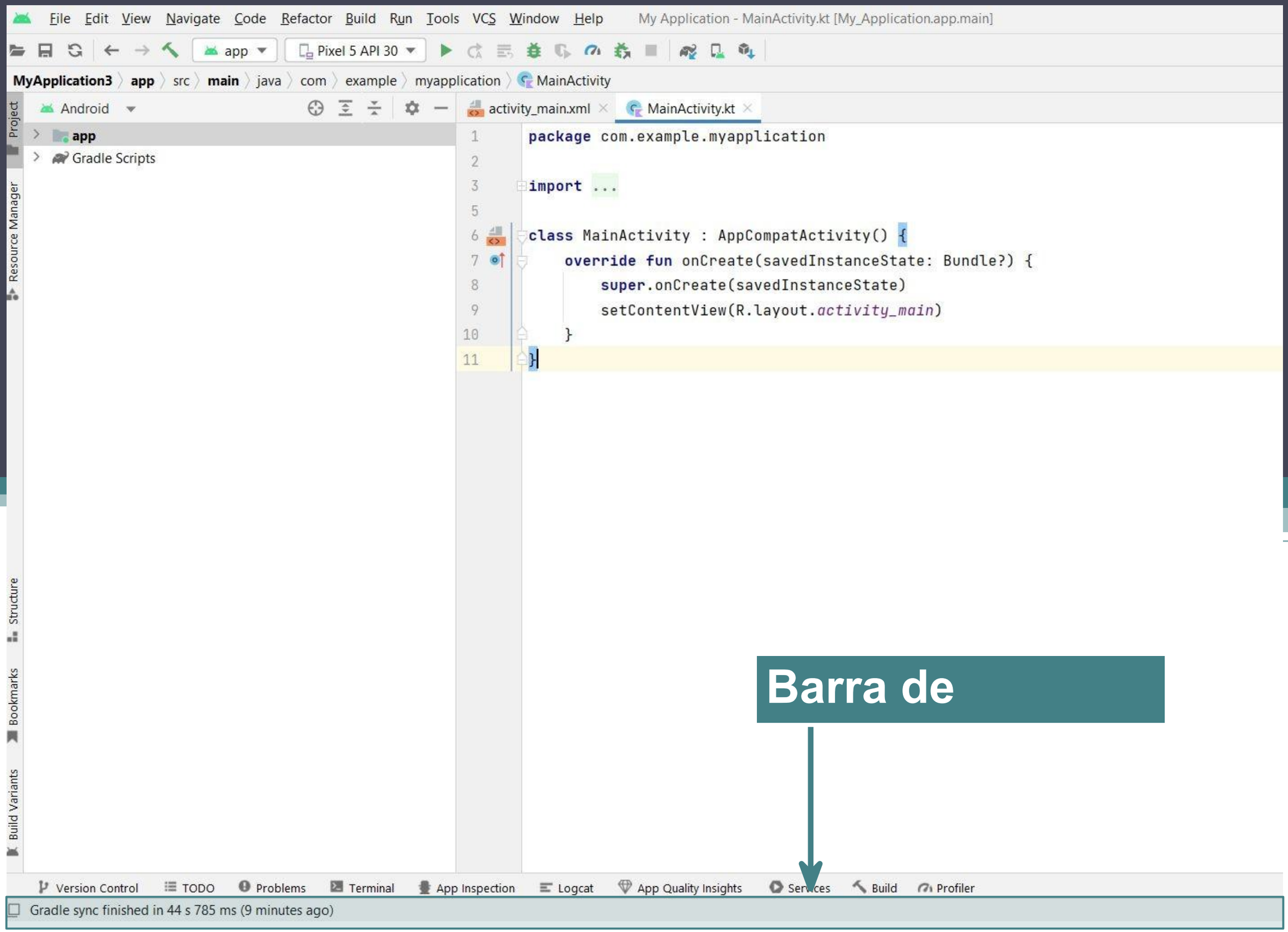
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Terminal
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Logcat
App Quality Insights
Services
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Profiler
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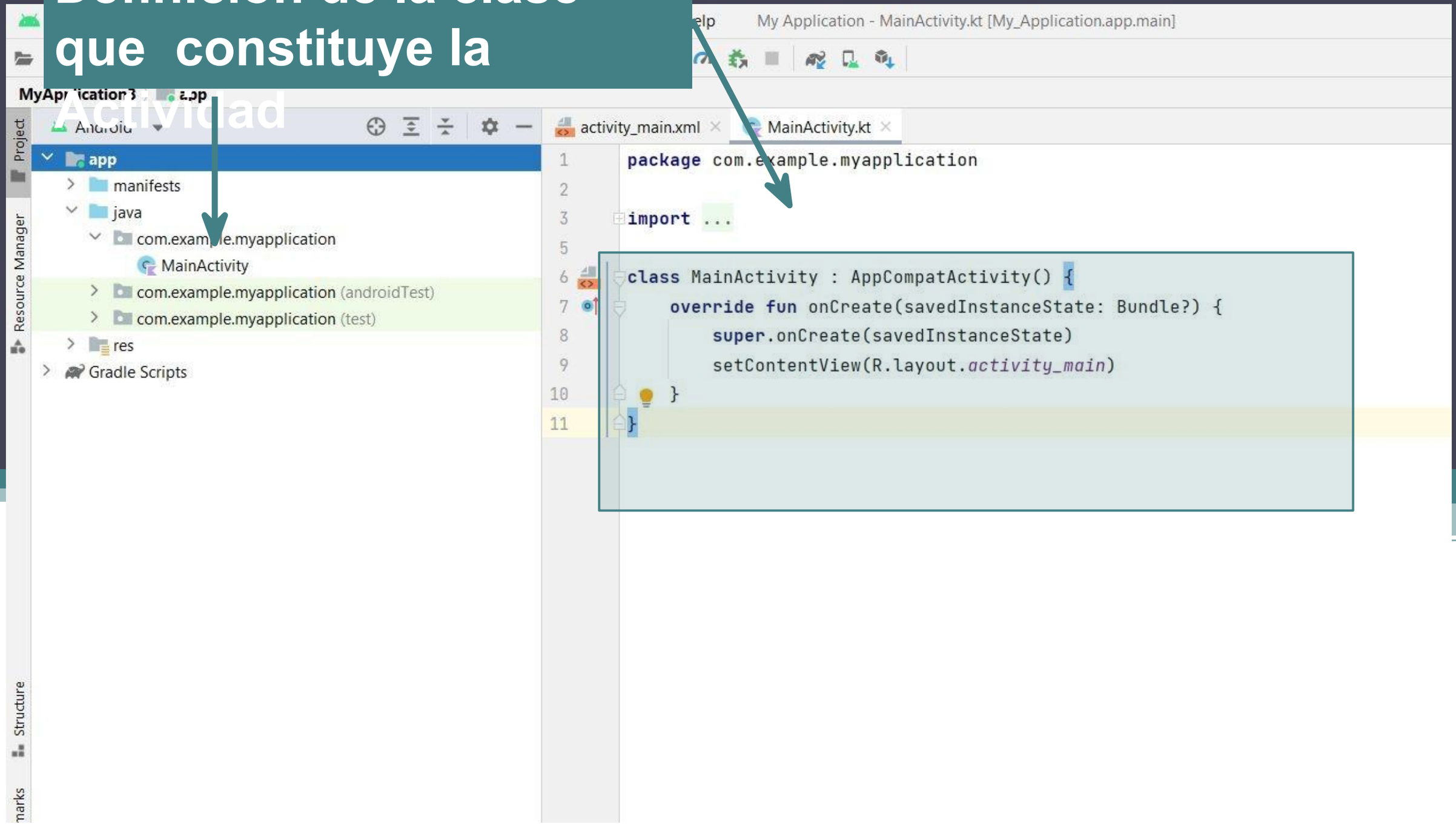
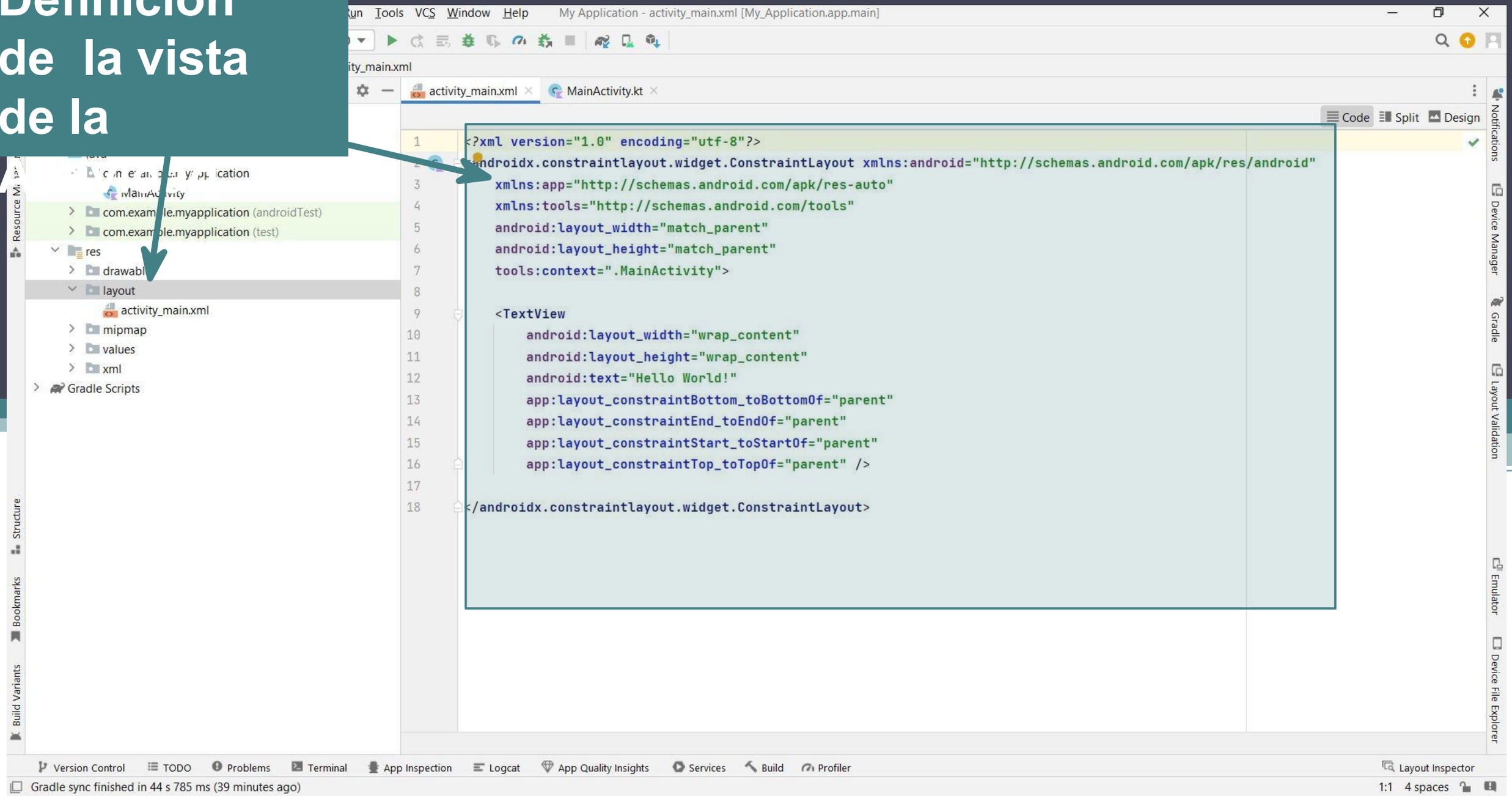
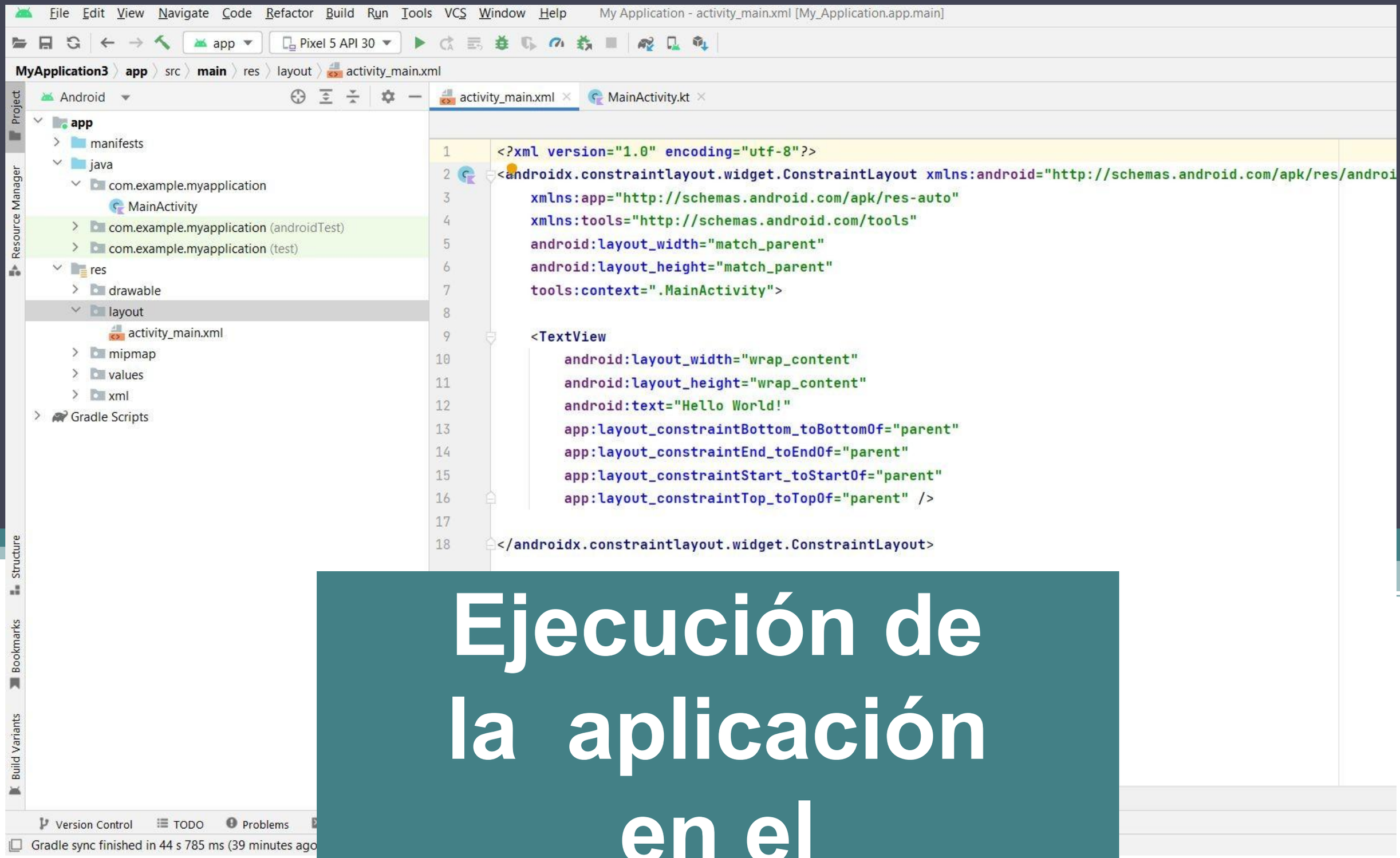
Definición de la clase que constituye la Actividad



Definición de la vista de la





Ejecución de la aplicación en el

Code Refactor Build Run Tools VCS Window Help My Application - MainActivity.kt [My_Application.app.main]

p Pixel 5 API 30

java com example myapplication MainActivity

activity_main.xml MainActivity.kt

```
1  package com.example.myapplication
2
3  import ...
5
6  class MainActivity : AppCompatActivity() {
7      override fun onCreate(savedInstanceState: Bundle?) {
8          super.onCreate(savedInstanceState)
9          setContentView(R.layout.activity_main)
10     }
```

Inicie el AVD Manager y corra el emulador del dispositivo

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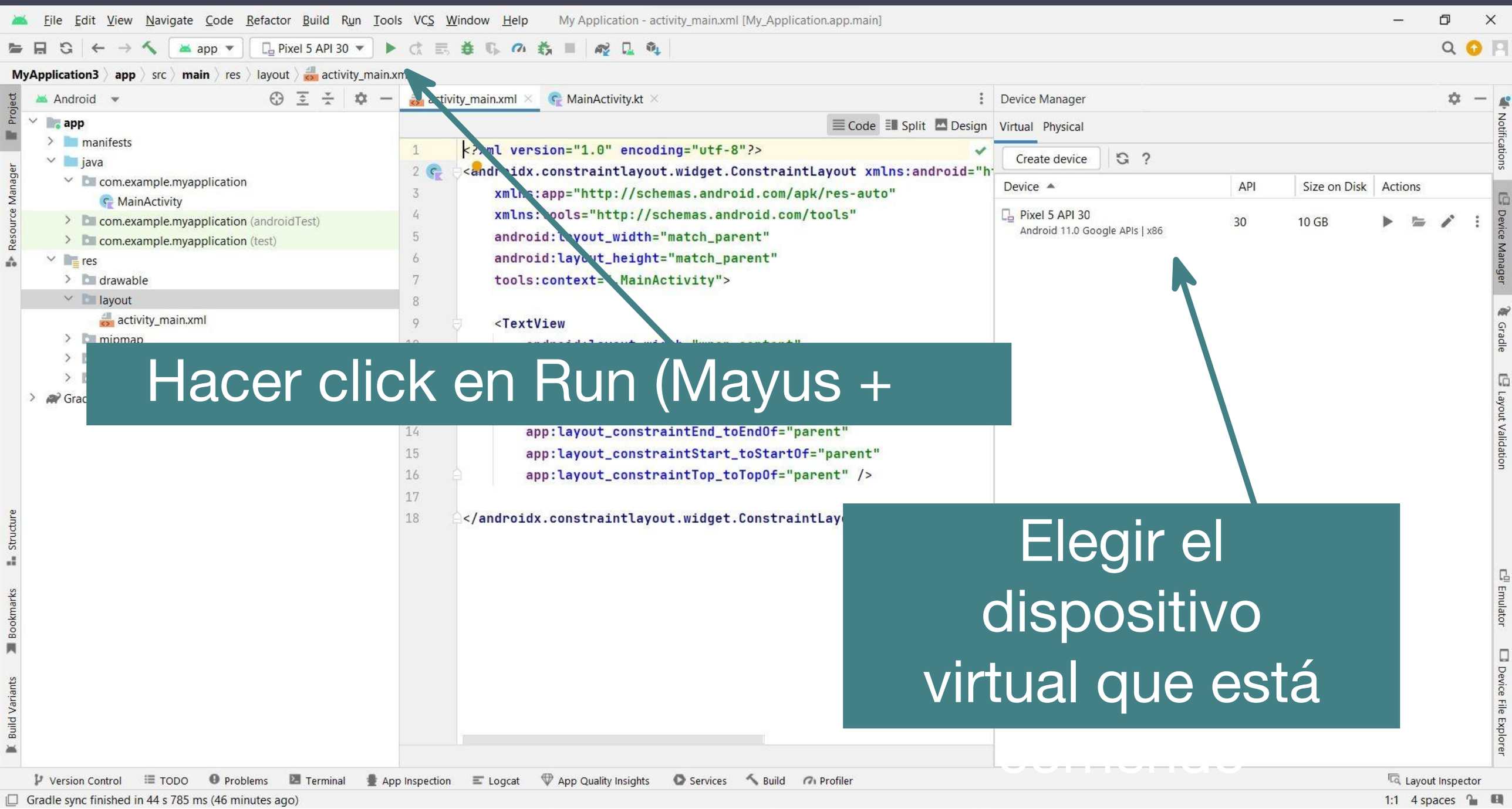
Problems Terminal App Inspection Logcat App Quality Insights Services Build Profiler

(9 minutes ago)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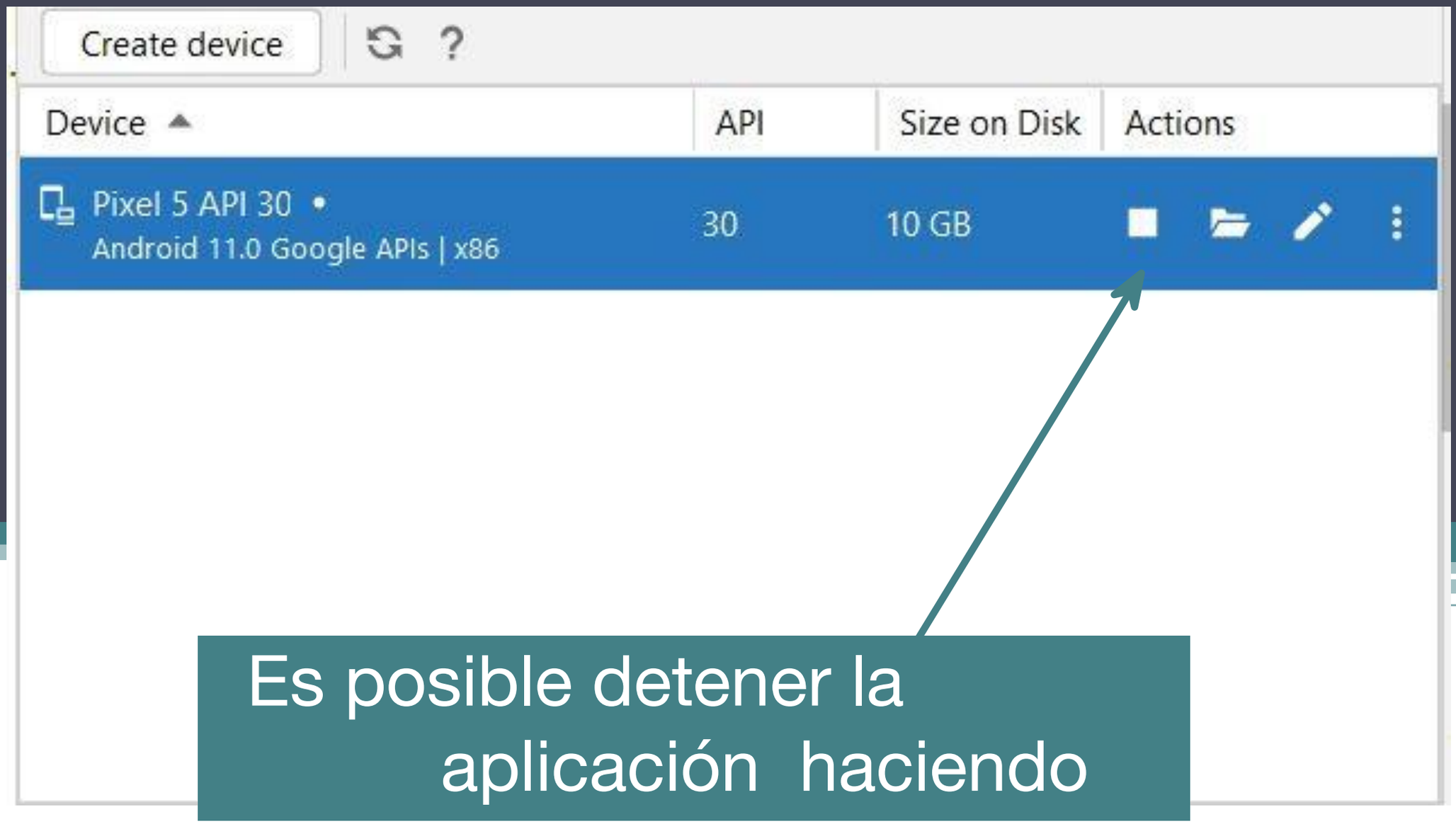
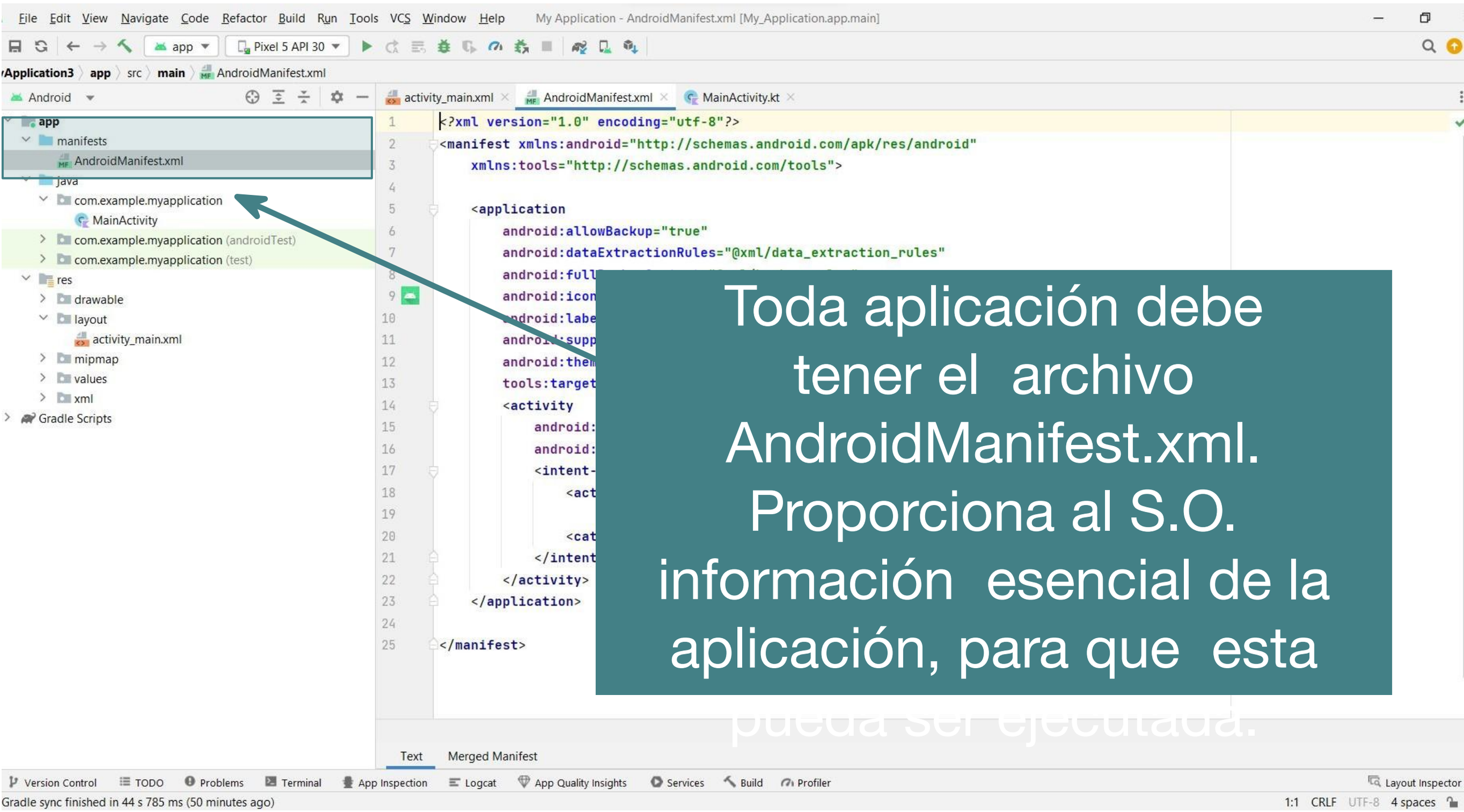
Pixel 5 API 30
MyApplication3 app src main res layout activity_main.xml
Android
app
manifests
java
com.example.myapplication
MainActivity
com.example.myapplication (androidTest)
com.example.myapplication (test)
res
drawable
layout
activity_main.xml
mipmap
activity_main.xml
MainActivity.kt
Code
Split
Design
<?xml version="1.0" encoding="utf-8"?>
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=".MainActivity">
<TextView
app:layout_constraintEnd_toEndOf="parent"
app:layout_constraintStart_toStartOf="parent"
app:layout_constraintTop_toTopOf="parent" />
Device Manager
Virtual
Physical
Create device
Device
API
Size on Disk
Actions
Pixel 5 API 30
Android 11.0 Google APIs | x86
30
10 GB
Hacer click en Run (Mayus +
Elegir el dispositivo virtual que está
Version Control
TODO
Problems
Terminal
App Inspection
Logcat
App Quality Insights
Services
Build
Profiler
Layout Inspector
Gradle sync finished in 44 s 785 ms (46 minutes ago)
1:1
4 spaces



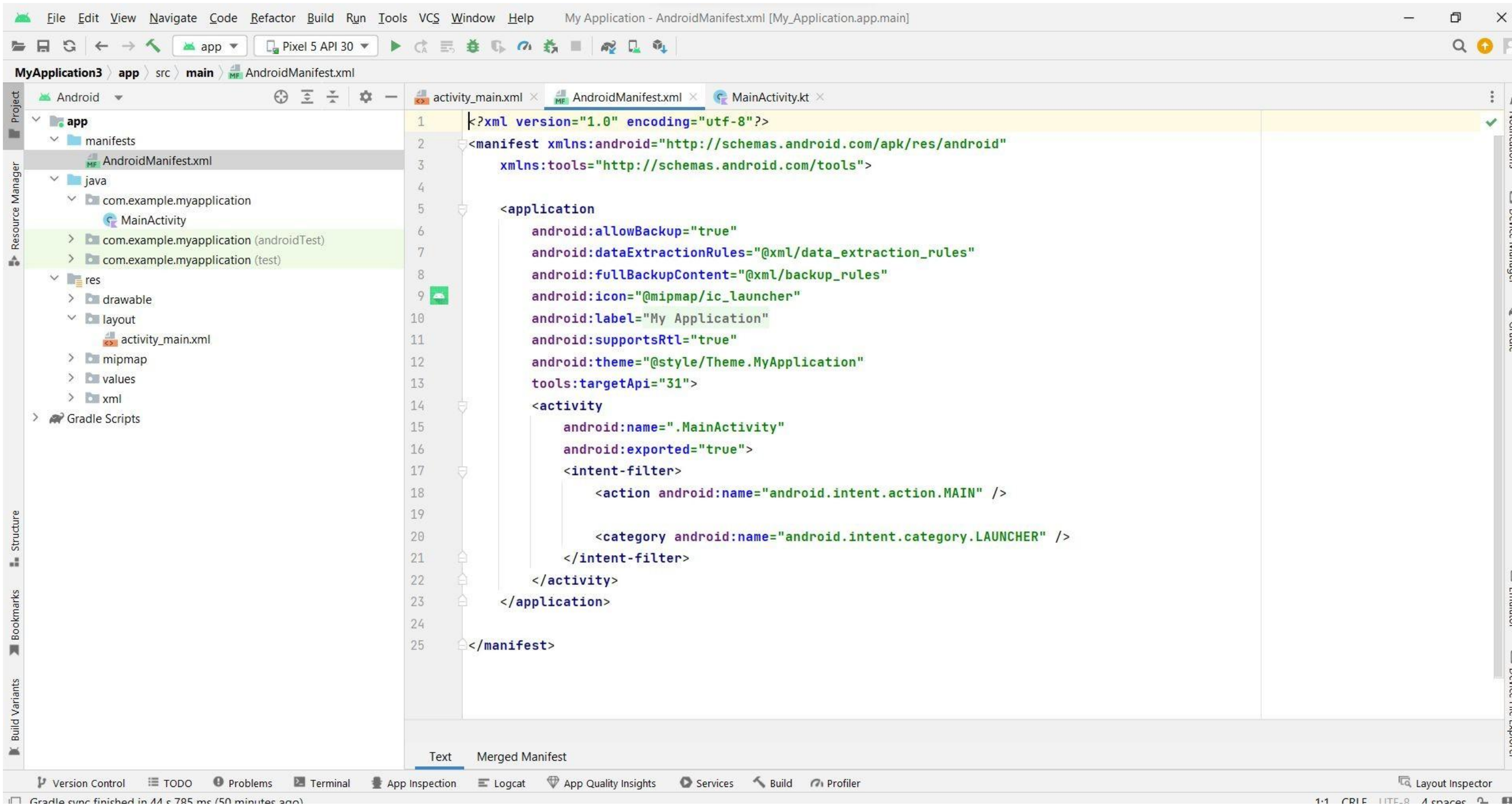
Es posible detener la aplicación haciendo

AndroidManifest.xml



Toda aplicación debe tener el archivo AndroidManifest.xml. Proporciona al S.O. información esencial de la aplicación, para que esta pueda ser ejecutada.

AndroidManifest.xml



AndroidManifest.xml

```
4
5       <application
6           android:allowBackup="true"
7           android:icon="@mipmap/ic_launcher"
8           android:label="My Application"
9           android:supportsRtl="true"
10          android:theme="@style/AppTheme">
11          <activity android:name=".MainActivity">
12              <intent-filter>
13                  <action android:name="android.intent.action.MAIN" />
14
15                  <category android:name="android.intent.category.LAUNCHER" />
16              </intent-filter>
17          </activity>
18      </application>
19
20  </manifest>
```

Cuando esta propiedad vale *true* se hace un respaldo de los datos de la aplicación en la cuenta de GoogleDrive del usuario

Text | Merged Manifest

4: Run | TODO | Event Log

AndroidManifest.xml

```
4
5       <application
6           android:allowBackup="true"
7           android:icon="@mipmap/ic_launcher"
8           android:label="My Application"
9           android:supportsRtl="true"
10          android:theme="@style/AppTheme">
11          <activity android:name=".MainActivity">
12              <intent-filter>
13                  <action android:name="android.intent.action.MAIN" />
14
15                  <category android:name="android.intent.category.LAUNCHER" />
16              </intent-filter>
17          </activity>
18      </application>
19
20  </manifest>
```

Ícono de la aplicación

AndroidManifest.xml

pplication3] - [app] - ...\app\src\main\AndroidManifest.xml - Android Studio 2.3

Run Tools VCS Window Help

app

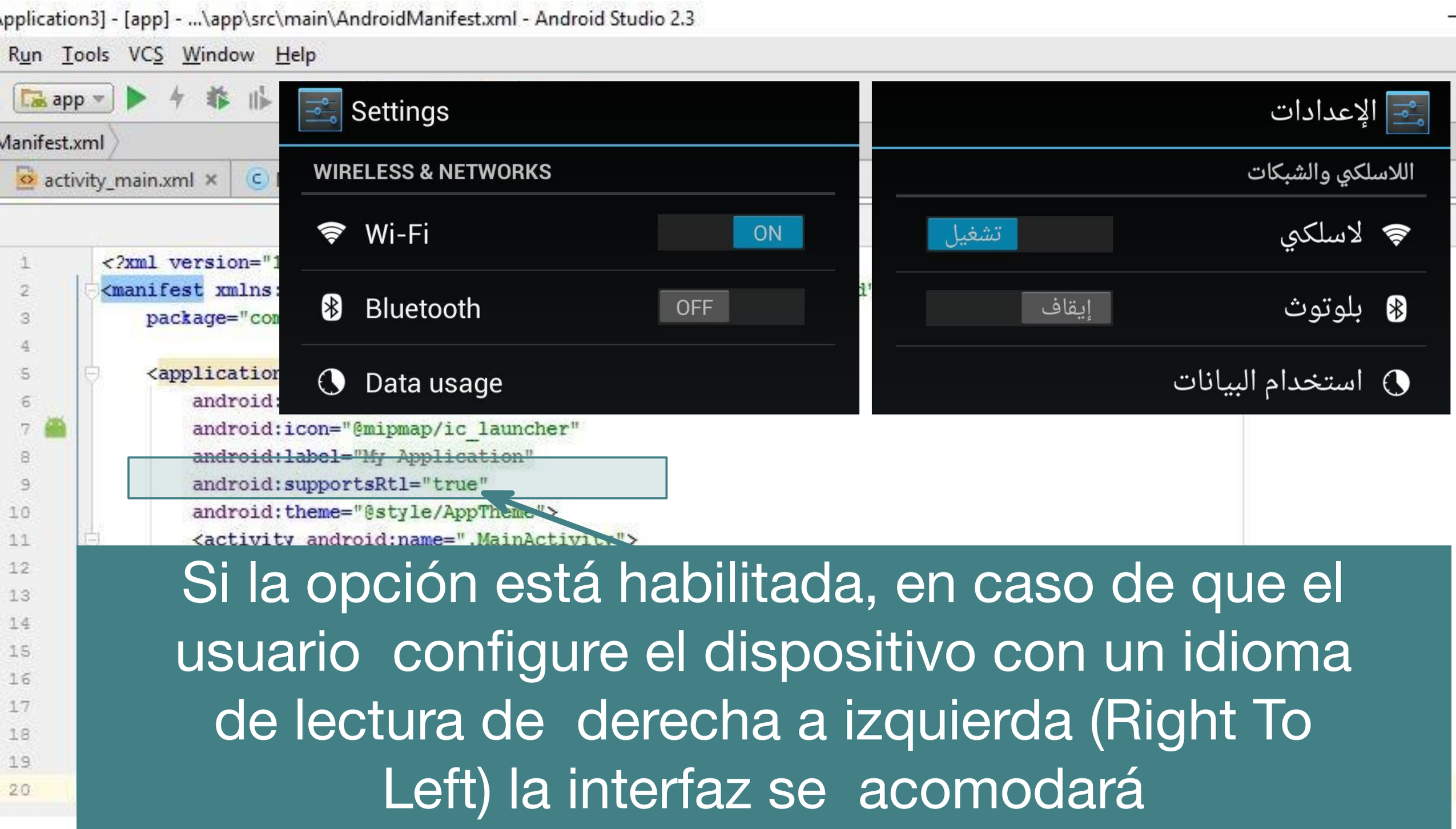
Manifest.xml

activity_main.xml × | MainActivity.java × | AndroidManifest.xml ×

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3      package="com.example.ldelia.myapplication">
4
5      <application
6          android:allowBackup="true"
7          android:icon="@mipmap/ic_launcher"
8          android:label="My Application"
9          android:supportsRtl="true"
10         android:theme="@style/AppTheme">
11         <activity android:name=".MainActivity">
12             <intent-filter>
13                 <action android:name="androi
14
15                 <category android:name="android.intent.category.LAUNCHER" />
16             </intent-filter>
17         </activity>
18     </application>
19
20 </manifest>
```

Título de la aplicación

AndroidManifest.xml



Si la opción está habilitada, en caso de que el usuario configure el dispositivo con un idioma de lectura de derecha a izquierda (Right To Left) la interfaz se acomodará

AndroidManifest.xml

pplication3] - [app] - ...\app\src\main\AndroidManifest.xml - Android Studio 2.3

Run Tools VCS Window Help

app

Manifest.xml

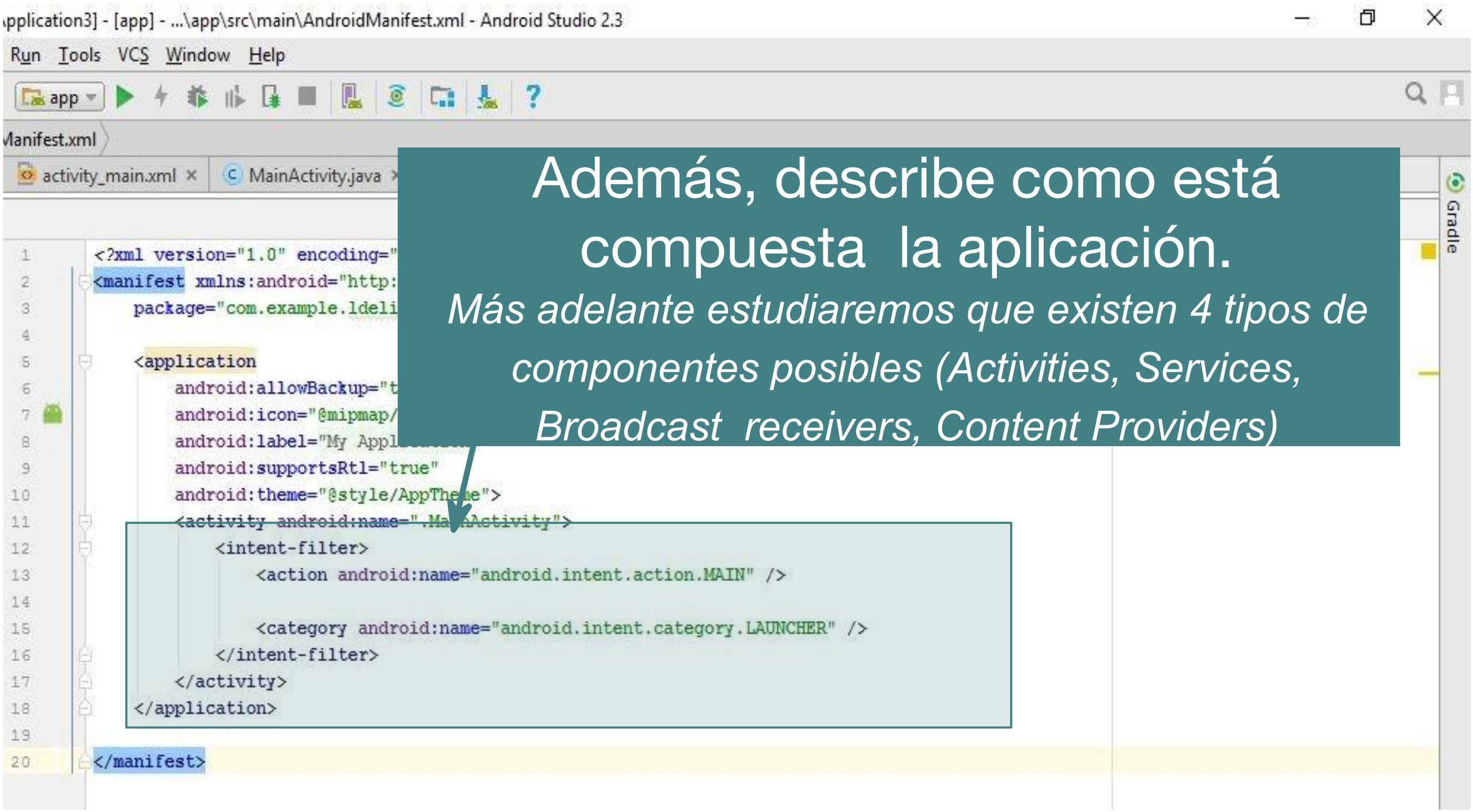
activity_main.xml × | MainActivity.java × | AndroidManifest.xml ×

```
1   <?xml version="1.0" encoding="utf-8"?>
2   <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3       package="com.example.ldelia.myapplication">
4
5       <application
6           android:allowBackup="true"
7           android:icon="@mipmap/ic_launcher"
8           android:label="My Application"
9           android:supportsRtl="true"
10          android:theme="@style/AppTheme">
11          <activity android:name=".MainActivity">
12              <intent-filter>
13                  <action android:name="android.intent.action.MAIN" />
14
15
16              </in
17          </activi
18      </applicatio
19
20  </manifest>
```

Tema de estilos de la aplicación.

En clases posteriores estudiaremos este tema

AndroidManifest.xml



AndroidManifest.xml

pplication3] - [app] - ...\app\src\main\AndroidManifest.xml - Android Studio 2.3

Run Tools VCS Window Help

app

Manifest.xml

activity_main.xml × | MainActivity.java × | AndroidManifest.xml ×

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http
3      package="com.example.ldeli
4
5      <application
6          android:allowBackup="
7          android:icon="@mipmap/
8          android:label="My Appl
9          android:supportsRtl="true"
10         android:theme="@style/AppTheme">
11         <activity android:name=".MainActivity">
12             <intent-filter>
13                 <action android:name="android.intent.action.MAIN" />
14
15                 <category android:name="android.intent.category.LAUNCHER" />
16             </intent-filter>
17         </activity>
18     </application>
19
20 </manifest>
```

Información para el S.O. de cómo se invoca a la actividad.

Lo estudiaremos también próximamente.

Permisos de usuario en AndroidManifest.xml

manifest | uses-permission

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http://schemas.android.com/ap
3      package="com.example.ldelia.myapplication">
4
5      <application
6          android:allowBackup="true"
7          android:icon="@mipmap/ic_launcher"
8          android:label="My Application"
9          android:supportsRtl="true"
10         android:theme="@style/AppTheme">
11         <activity android:name=".MainActivity">
12             <intent-filter>
13                 <action android:name="android.intent.a
14
15                 <category android:name="android.intent.category.LAUNCHER" />
16             </intent-filter>
17         </activity>
18
19     </application>
20
21     <uses-permission android:name="android.permission.">
22 </manifest>
```

```
android.permission.ACCESS_CHECKIN_PROPERTIES
android.permission.ACCESS_COARSE_LOCATION
android.permission.ACCESS_FINE_LOCATION
android.permission.ACCESS_LOCATION_EXTRA_COMMANDS
android.permission.ACCESS_NETWORK_STATE
android.permission.ACCESS_NOTIFICATION_POLICY
android.permission.ACCESS_WIFI_STATE
android.permission.ACCOUNT_MANAGER
android.permission.BATTERY_STATS
android.permission.BIND_ACCESSIBILITY_SERVICE
```

Text | Merged Manifest

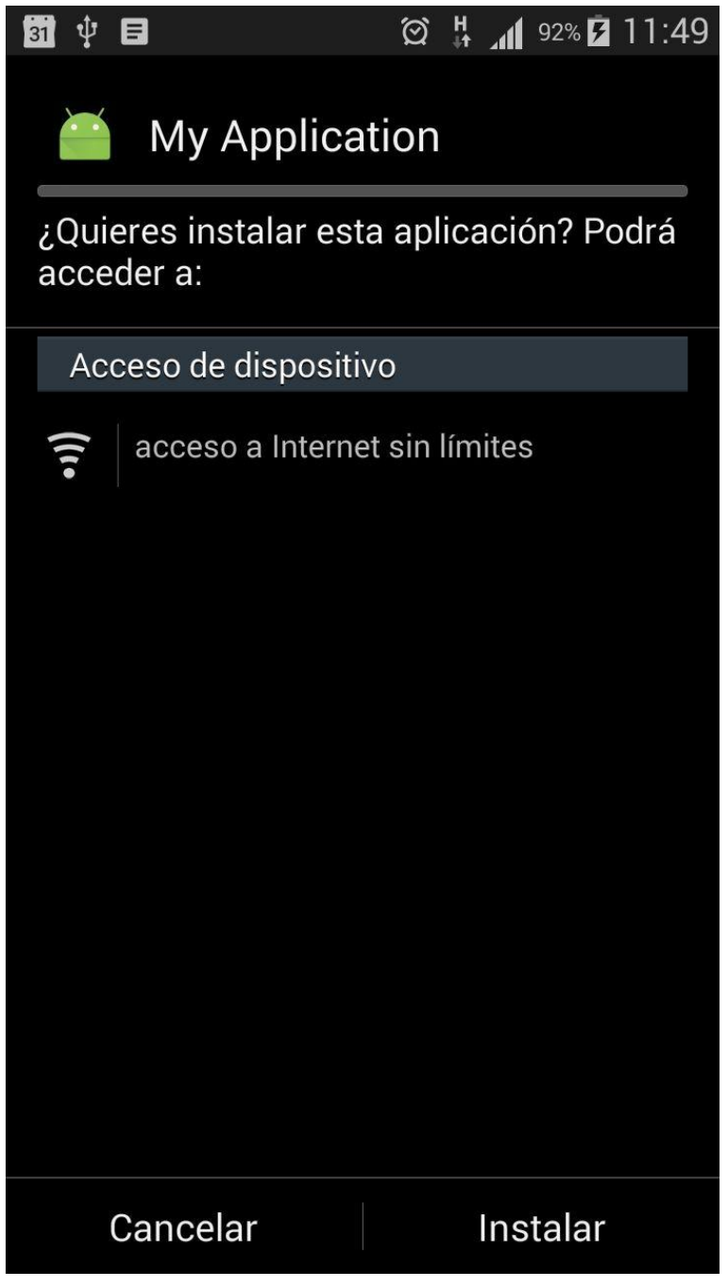
Terminal

Permisos que el usuario debe aceptar para que la aplicación pueda acceder a un recurso

Permisos de usuario en AndroidManifest.xml

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

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        an
        an
        an
        <a
            <action android:name="android.intent.action.MAIN" />

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

</application>

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

Ejemplo de acceso a internet



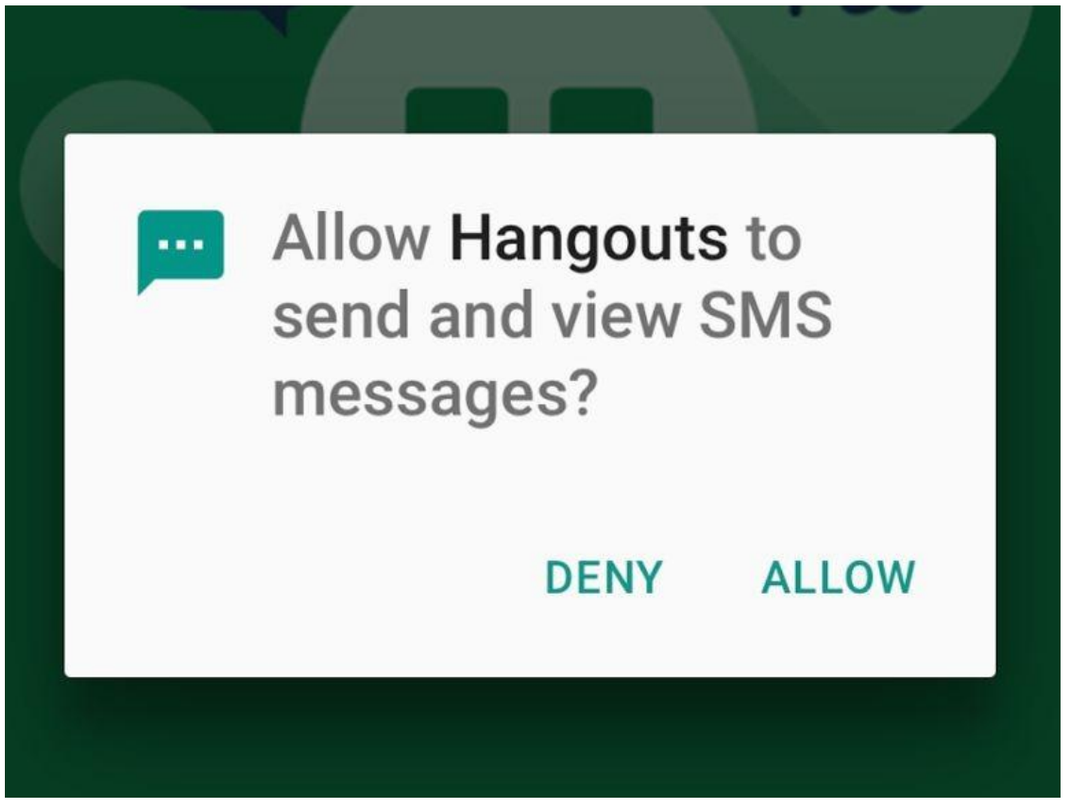
Permisos de usuario en AndroidManifest.xml

- En versiones inferiores a Android 6 el usuario acepta los permisos en el

  momento de la instalación

- Desde Android 6 los usuarios aceptan

  los permisos cuando la aplicación se

  está ejecutando.

  - Simplifica el proceso de instalación.
  - El usuario tiene mayor control. Puede aceptar algunos permisos y otros no