

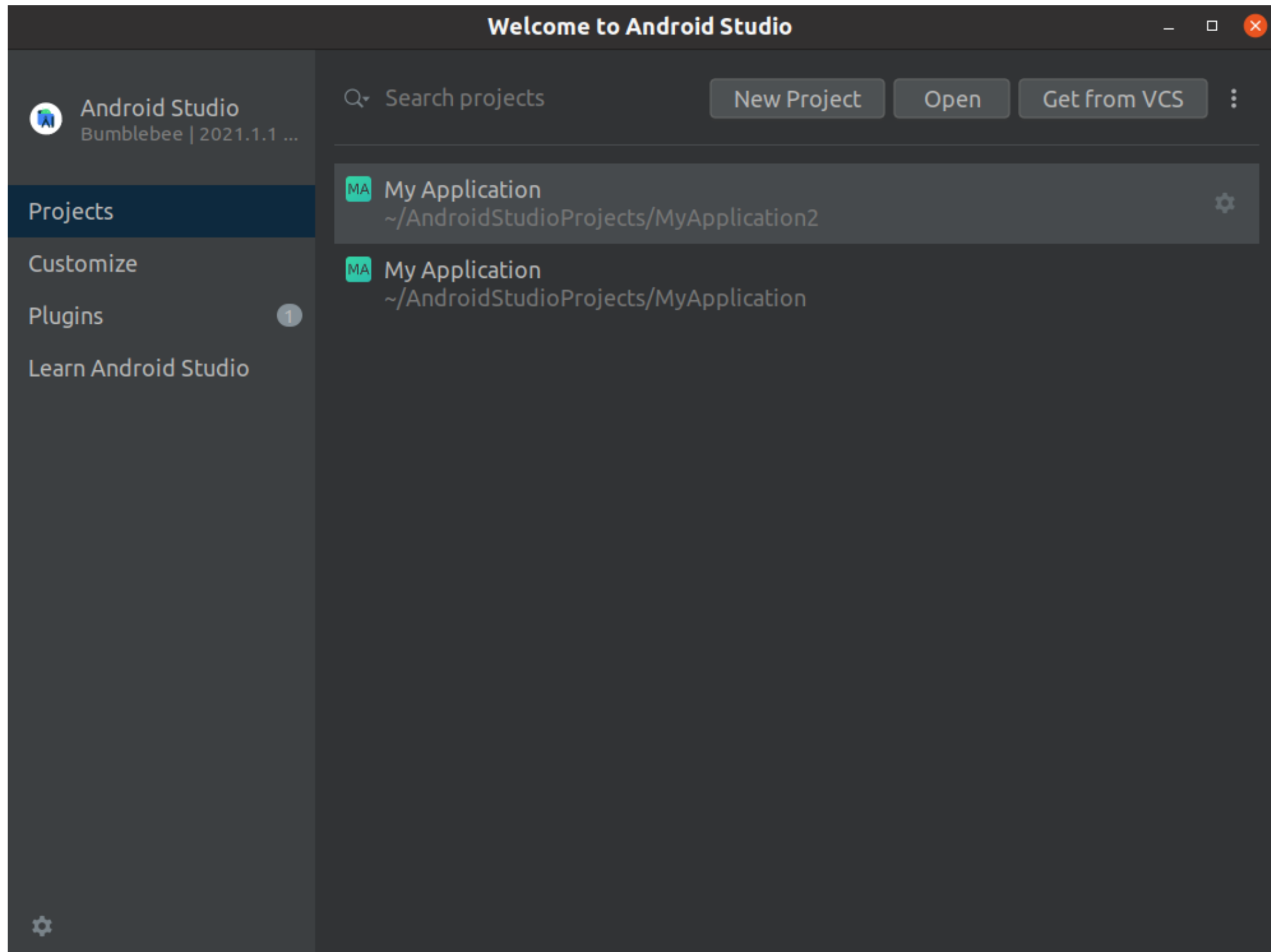
SEMINARIO DE LENGUAJES OPCIÓN ANDROID + KOTLIN



Primeros pasos con Android

Esp. Fernández Sosa Juan Francisco

Hacer clic en *el menú derecho / SDK Manager*



Hacer clic en *Configure / SDK Manager*

Appearance & Behavior

Appearance

Menus and Toolbars

System Settings

HTTP Proxy

Data Sharing

Date Formats

Updates

Process Elevation

Passwords

Android SDK

Memory Settings

Notifications

Quick Lists

Path Variables

Keymap

Editor

Build, Execution, Deployment

Languages & Frameworks

Tools

Advanced Settings

Appearance & Behavior > System Settings > Android SDK

Manager for the Android SDK and Tools used by the IDE

Android SDK Location: /Users/jfernandez/Library/Android/sdk

Edit Optimize disk space

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, the IDE will automatically check for updates. Check "show package details" to display individual SDK components.

Name	API Level	Revision	Status
<input type="checkbox"/> Android UpsideDownCake Preview	UpsideDownCake	1	Not installed
<input type="checkbox"/> Android TiramisuPrivacySandbox Preview	TiramisuPrivacySandbox	9	Not installed
<input type="checkbox"/> Android API 33	33	2	Partially installed
<input type="checkbox"/> Android API 32 (Sv2)	32	1	Update available
<input checked="" type="checkbox"/> Android 12.0 (S)	31	1	Update available
<input type="checkbox"/> Android 11.0 (R)	30	3	Partially installed
<input checked="" type="checkbox"/> Android 10.0 (Q)	29	5	Installed
<input type="checkbox"/> Android 9.0 (Pie)	28	6	Partially installed
<input type="checkbox"/> Android 8.1 (Oreo)	27	3	Partially installed
<input type="checkbox"/> Android 8.0 (Oreo)	26	2	Not installed
<input type="checkbox"/> Android 7.1.1 (Nougat)	25	3	Partially installed
<input type="checkbox"/> Android 7.0 (Nougat)	24	2	Not installed
<input type="checkbox"/> Android 6.0 (Marshmallow)	23	3	Not installed
<input type="checkbox"/> Android 5.1 (Lollipop)	22	2	Not installed
<input type="checkbox"/> Android 5.0 (Lollipop)	21	2	Not installed

Android 10 instalado
Android 11 parcialmente instalado
Android 12 actualizaciones disponibles

Hacer clic en *Configure / SDK Manager*

Q

Appearance & Behavior > System Settings > Android SDK

Appearance & Behavior

Appearance

Menus and Toolbars

System Settings

HTTP Proxy

Data Sharing

Date Formats

Updates

Process Elevation

Passwords

Android SDK

Memory Settings

Notifications

Quick Lists

Path Variables

Keymap

Editor

Manager for the Android SDK and Tools used by the IDE

Android SDK Location: /Users/jfernandez/Library/Android/sdk Edit Optimize disk space

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, the IDE will automatically check for updates. Check "show package details" to display individual SDK components.

	Name	API Level	Revision	Status
<input type="checkbox"/>	Android UpsideDownCake Preview	UpsideDownCake	1	Not installed
<input type="checkbox"/>	Android TiramisuPrivacySandbox Preview	TiramisuPrivacySandbox	9	Not installed
<input type="checkbox"/>	Android API 33	33	2	Partially installed
<input type="checkbox"/>	Android API 32 (Sv2)	32	1	Update available
<input checked="" type="checkbox"/>	Android 12.0 (S)	31	1	Update available
<input type="checkbox"/>	Android 11.0 (R)	30	3	Partially installed
<input checked="" type="checkbox"/>	Android 10.0 (Q)	29	5	Installed
<input type="checkbox"/>	Android 9.0 (Pie)	28	6	Partially installed
<input type="checkbox"/>	Android 8.1 (Oreo)	27	3	Partially installed
<input type="checkbox"/>	Android 8.0 (Oreo)	26	2	Not installed
<input type="checkbox"/>	Android 7.1.1 (Nougat)	25	3	Partially installed
<input type="checkbox"/>	Android 7.0 (Nougat)	24	2	Not installed
		23	3	Not installed
		22	2	Not installed
		21	2	Not installed
		20	2	Not installed
		19	4	Partially installed
		18	3	Not installed
		17	2	Not installed

☒ Hide Obsolete Packages ☐ Show Package Details

Desarrollar aplicaciones para versiones antiguas de Android NO requiere instalar las APIs correspondientes a esas versiones

Hacer clic en *Configure / SDK Manager*

Q

Appearance & Behavior > System Settings > Android SDK

Appearance & Behavior

Appearance

Menus and Toolbars

System Settings

HTTP Proxy

Data Sharing

Date Formats

Updates

Process Elevation

Passwords

Android SDK

Memory Settings

Notifications

Quick Lists

Path Variables

Keymap

Editor

Build, Execution, Deployment

Languages & Frameworks

Tools

Advanced Settings

Manager for the Android SDK and Tools used by the IDE

Android SDK Location: [Edit](#) [Optimize disk space](#)

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, the IDE will automatically check for updates. Check "show package details" to display individual SDK components.

	Name	API Level	Revision	Status
<input type="checkbox"/>	Android UpsideDownCake Preview	UpsideDownCake	1	Not installed
<input type="checkbox"/>	Android TiramisuPrivacySandbox Preview	TiramisuPrivacySandbox	9	Not installed
<input type="checkbox"/>	Android API 33	33	2	Partially installed
<input type="checkbox"/>	Android API 32 (Sv2)	32	1	Update available
<input checked="" type="checkbox"/>	Android 12.0 (S)	31	1	Update available
<input type="checkbox"/>	Android 11.0 (R)	30	3	Partially installed
<input checked="" type="checkbox"/>	Android 10.0 (Q)	29	5	Installed
<input type="checkbox"/>	Android 9.0 (Pie)	28	6	Partially installed
<input type="checkbox"/>	Android 8.1 (Oreo)	27	3	Partially installed
<input type="checkbox"/>	Android 8.0 (Oreo)	26	2	Not installed
<input type="checkbox"/>	Android 7.1.1 (Nougat)	25	3	Partially installed
<input type="checkbox"/>	Android 7.0 (Nougat)	24	2	Not installed
<input type="checkbox"/>	Android 6.0 (Marshmallow)	23	3	Not installed
<input type="checkbox"/>	Android 5.1 (Lollipop)	22	2	Not installed
<input type="checkbox"/>	Android 5.0 (Lollipop)	21	2	Not installed
<input type="checkbox"/>	Android 4.4W (KitKat Wear)	20	2	Not installed
<input type="checkbox"/>	Android 4.4 (KitKat)	19	4	Partially installed
<input type="checkbox"/>	Android 4.3 (Jelly Bean)	18	3	Not installed
<input type="checkbox"/>	Android 4.2 (Jelly Bean)	17	2	Not installed

☒ Hide Obsolete Packages ☐ Show Package Details

Hacer clic aquí

Hacer clic en *Configure / SDK Manager*

Appearance & Behavior > System Settings > Android SDK

Manager for the Android SDK and Tools used by the IDE

Android SDK Location: [Edit](#) [Optimize disk space](#)

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, the IDE will automatically check for updates. Check "show package details" to display individual SDK components.

	Name	API Level	Revi...	Status
>	<input type="checkbox"/> Android API 33, Extension Level 4			
>	<input type="checkbox"/> Android API 32 (Sv2)			
▼	<input checked="" type="checkbox"/> Android 12.0 (S)			
	<input checked="" type="checkbox"/> Android SDK Platform 31	31	1	Installed
	<input checked="" type="checkbox"/> Sources for Android 31	31	1	Installed
	<input type="checkbox"/> Android TV ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Android TV Intel x86 Atom System Image	31	4	Not installed
	<input type="checkbox"/> ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Intel x86_64 Atom System Image	31	4	Not installed
	<input type="checkbox"/> Google TV ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Google TV Intel x86 Atom System Image	31	4	Not installed
	<input type="checkbox"/> Google APIs ARM 64 v8a System Image	31	8	Update Availa...
	<input type="checkbox"/> Google APIs Intel x86_64 Atom System Image	31	12	Not installed
	<input type="checkbox"/> Google Play ARM 64 v8a System Image	31	9	Not installed
	<input type="checkbox"/> Google Play Intel x86_64 Atom System Image	31	9	Not installed
▼	<input checked="" type="checkbox"/> Android S Preview		2	Installed

☒ Show Package Details

[Apply](#) [OK](#)

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

Hacer clic en *Configure / SDK Manager*

Appearance & Behavior

Manager for the Android SDK and Tools used by the IDE

Appearance

Menus and Toolbars

System Settings

HTTP Proxy

Data Sharing

Date Formats

Updates

Process Elevation

Passwords

Android SDK

Memory Settings

Notifications

Quick Lists

Path Variables

Keymap

Editor

Build, Execution, Deployment

Languages & Frameworks

Tools

Advanced Settings

Android SDK Location: /Users/jfernandez/Library/Android/sdk

Edit Optimize disk space

SDK Platforms

SDK Tools

SDK Update Sites

Each Android SDK Platform package includes the
an API level by default. Once installed, the IDE will
"show package details" to display individual SDK

	Name			
>	<input type="checkbox"/> Android API 33, Extension Level 4			
>	<input type="checkbox"/> Android API 32 (Sv2)			
▼	<input checked="" type="checkbox"/> Android 12.0 (S)			
	<input checked="" type="checkbox"/> Android SDK Platform 31			
	<input checked="" type="checkbox"/> Sources for Android 31	31	1	Installed
	<input type="checkbox"/> Android TV ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Android TV Intel x86 Atom System Image	31	4	Not installed
	<input type="checkbox"/> ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Intel x86_64 Atom System Image	31	4	Not installed
	<input type="checkbox"/> Google TV ARM 64 v8a System Image	31	4	Not installed
	<input type="checkbox"/> Google TV Intel x86 Atom System Image	31	4	Not installed
	<input type="checkbox"/> Google APIs ARM 64 v8a System Image	31	8	Update Availa...
	<input type="checkbox"/> Google APIs Intel x86_64 Atom System Image	31	12	Not installed
	<input type="checkbox"/> Google Play ARM 64 v8a System Image	31	9	Not installed
	<input type="checkbox"/> Google Play Intel x86_64 Atom System Image	31	9	Not installed
▼	<input checked="" type="checkbox"/> Android S Preview			
	<input checked="" type="checkbox"/> Google Play ARM 64 v8a System Image	S	2	Installed
▼	<input type="checkbox"/> Android 11.0 (R)			
	<input type="checkbox"/> Android SDK Platform 30	30	2	Installed

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

☒ Hide Obsolete Packages

☒ Show Package Details



Project-level settings will be applied to new projects

Cancel

Apply

OK

Hacer clic en *Configure / SDK Manager*

Appearance & Behavior > System Settings > Android SDK

Appearance & Behavior

Appearance

Menus and Toolbars

System Settings

HTTP Proxy

Data Sharing

Date Formats

Updates

Process Elevation

Passwords

Android SDK

Memory Settings

Notifications

Quick Lists

Path Variables

Keymap

Editor

Build, Execution, Deployment

Languages & Frameworks

Tools

Advanced Settings

Manager for the Android SDK and Tools used by the IDE

Android SDK Location: /Users/jfernandez/Library/Android/sdk

Edit Optimize disk space

SDK Platforms

Each Android SDK Platform package contains an API level by default. Once you select a package, click "show package details" to display more information.

Name	API Level	Size	Status
> <input type="checkbox"/> Android API 33, 32, 31			
> <input type="checkbox"/> Android API 32 (64-bit)			
> <input checked="" type="checkbox"/> Android 12.0 (S)			
<input checked="" type="checkbox"/> Android SDK Platform 31	31	1	Installed
<input checked="" type="checkbox"/> Sources for Android 31	31	1	Installed
<input type="checkbox"/> Android TV ARM 64 v8a System Image	31	4	Not installed
<input type="checkbox"/> Android TV Intel x86 Atom System Image	31	4	Not installed
<input type="checkbox"/> ARM 64 v8a System Image	31	4	Not installed
<input type="checkbox"/> Intel x86_64 Atom System Image	31	4	Not installed
<input type="checkbox"/> Google TV ARM 64 v8a System Image	31	4	Not installed
<input type="checkbox"/> Google TV Intel x86 Atom System Image	31	4	Not installed
<input type="checkbox"/> Google APIs ARM 64 v8a System Image	31	8	Update Available
<input type="checkbox"/> Google APIs Intel x86_64 Atom System Image	31	12	Not installed
<input type="checkbox"/> Google Play ARM 64 v8a System Image	31	9	Not installed
<input type="checkbox"/> Google Play Intel x86_64 Atom System Image	31	9	Not installed
> <input checked="" type="checkbox"/> Android S Preview			
<input checked="" type="checkbox"/> Google Play ARM 64 v8a System Image	S	2	Installed
> <input type="checkbox"/> Android 11.0 (R)			
<input checked="" type="checkbox"/> Android SDK Platform 30	30	2	Installed

Hide Obsolete Packages

Show Package Details

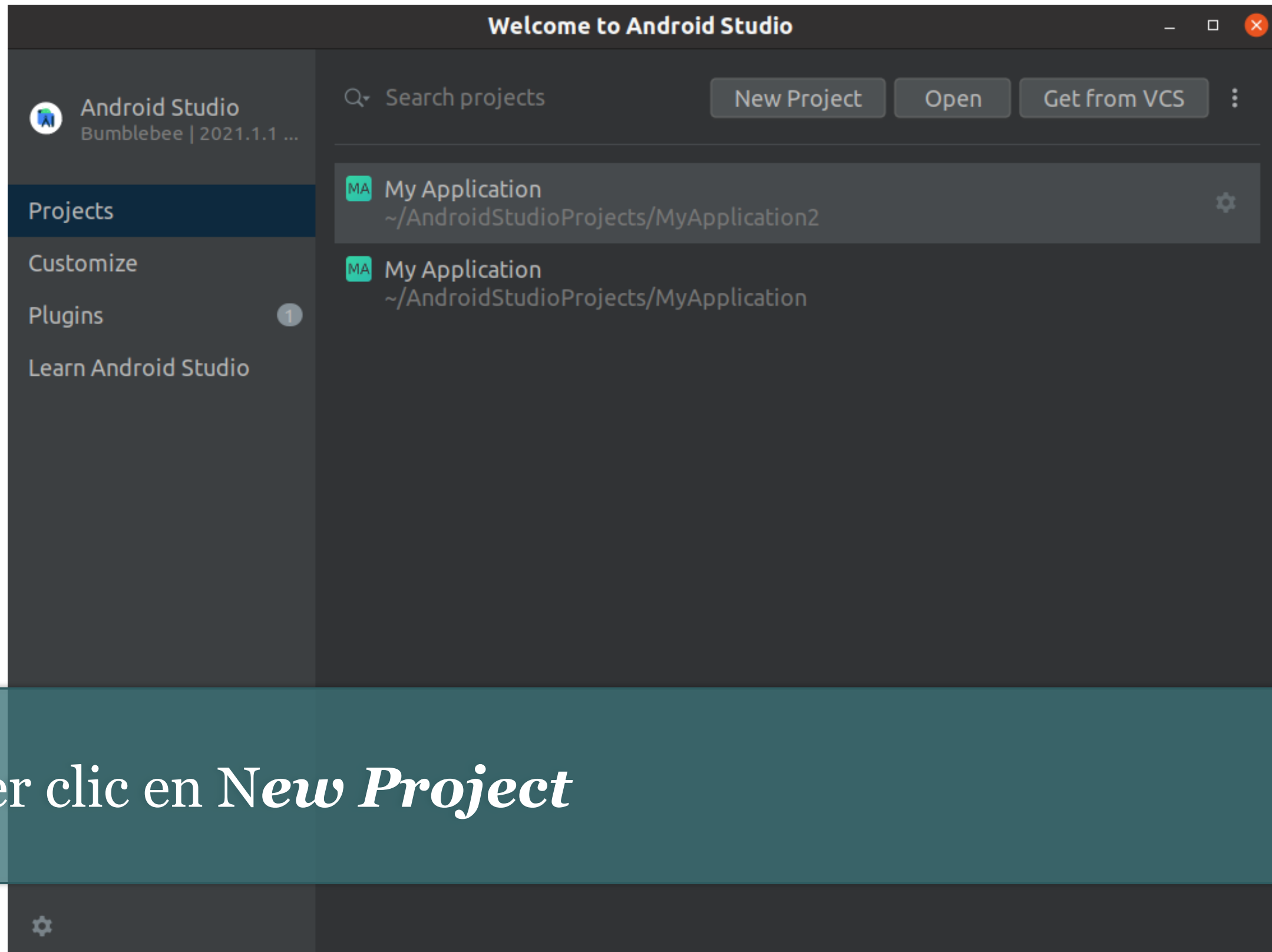
Project-level settings will be applied to new projects

Cancel

Apply

OK

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



Hacer clic en *New Project*

Templates

Phone and Tablet

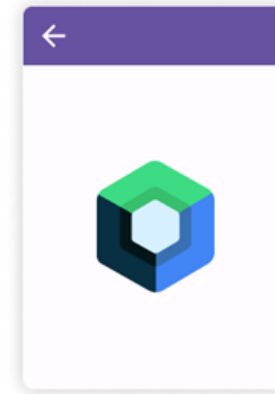
Wear OS

Television

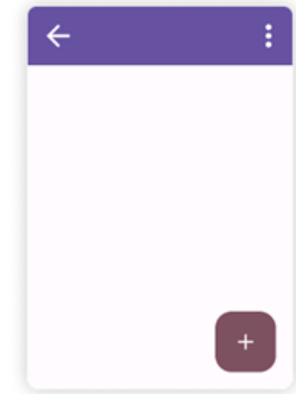
Automotive



No Activity



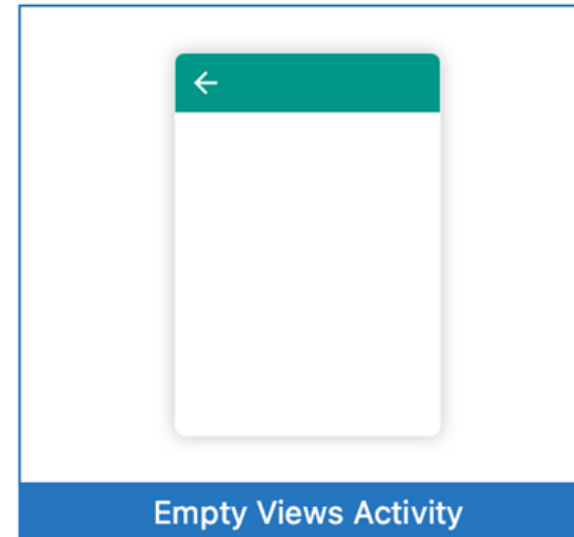
Empty Activity



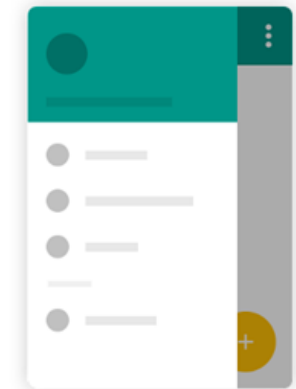
Basic Views Activity



Bottom Navigation Views Activity



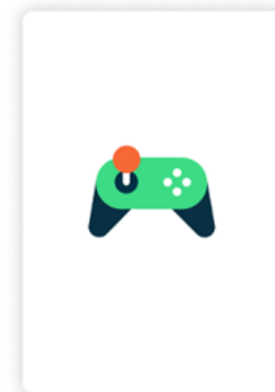
Empty Views Activity



Navigation Drawer Views Activity



Responsive Views Activity



Game Activity (C++)



Native C++

Cancel

Previous




Next

Finish

Debemos elegir Empty Views Activity y luego click en Next

Empty Views Activity

Creates a new empty activity

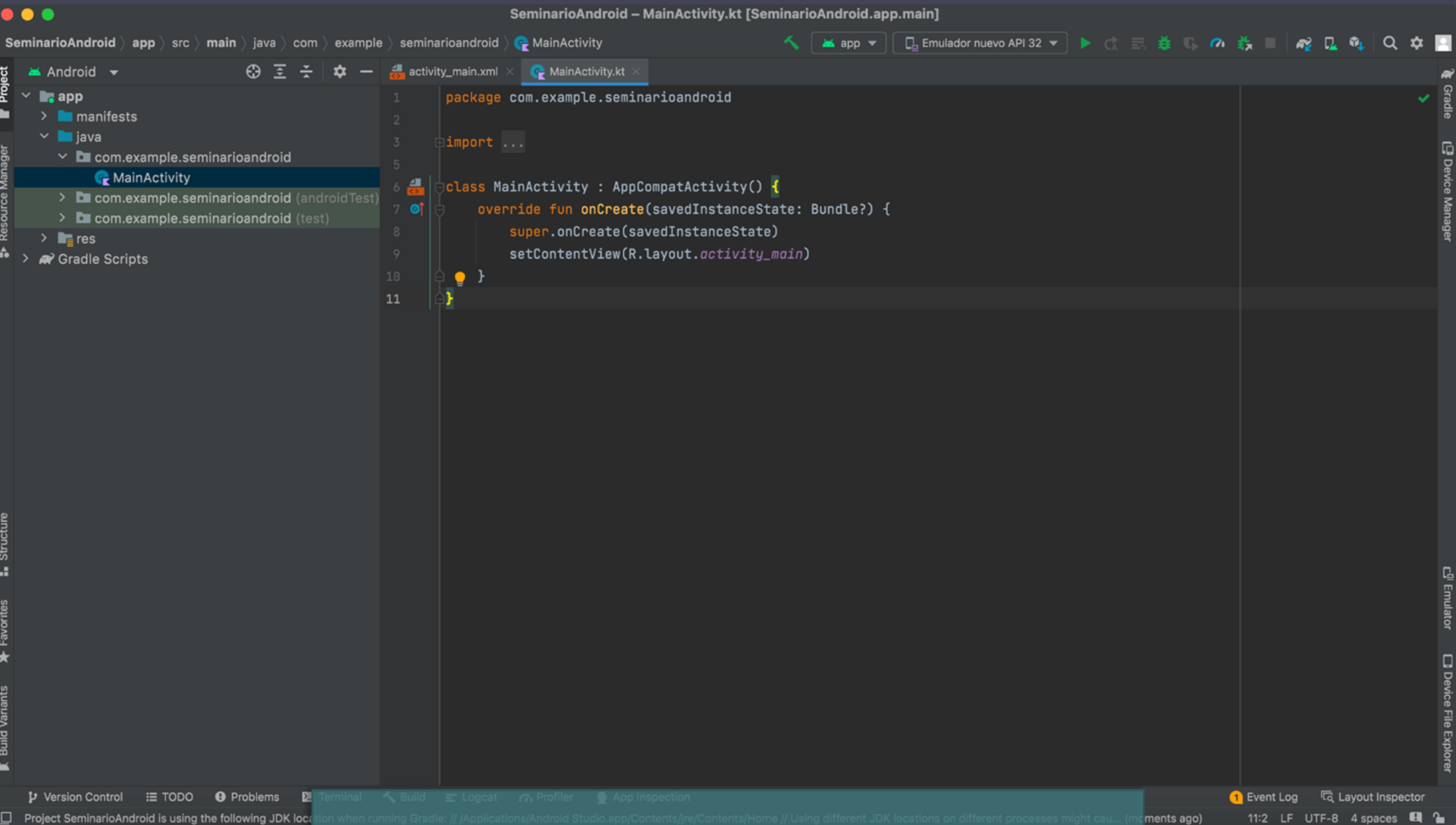
Name	<input type="text" value="My Application"/>
Package name	<input type="text" value="com.example.myapplication"/>
Save location	<input type="text" value="/Users/jfernandez/AndroidStudioProjects/MyApplication10"/> 
Language	<input type="text" value="Kotlin"/> ▼
Minimum SDK	<input 7.0)"="" android="" nougat";="" type="text" value="API 24 ("/> ▼
<p> Your app will run on approximately 96.3% of devices. Help me choose</p>	
Build configuration language 	<input type="text" value="Kotlin DSL (build.gradle.kts) [Recommended]"/> ▼

Poner un nombre a la aplicación, seleccionar Kotlin como lenguaje y elegir Minimum SDK: ***API 24***

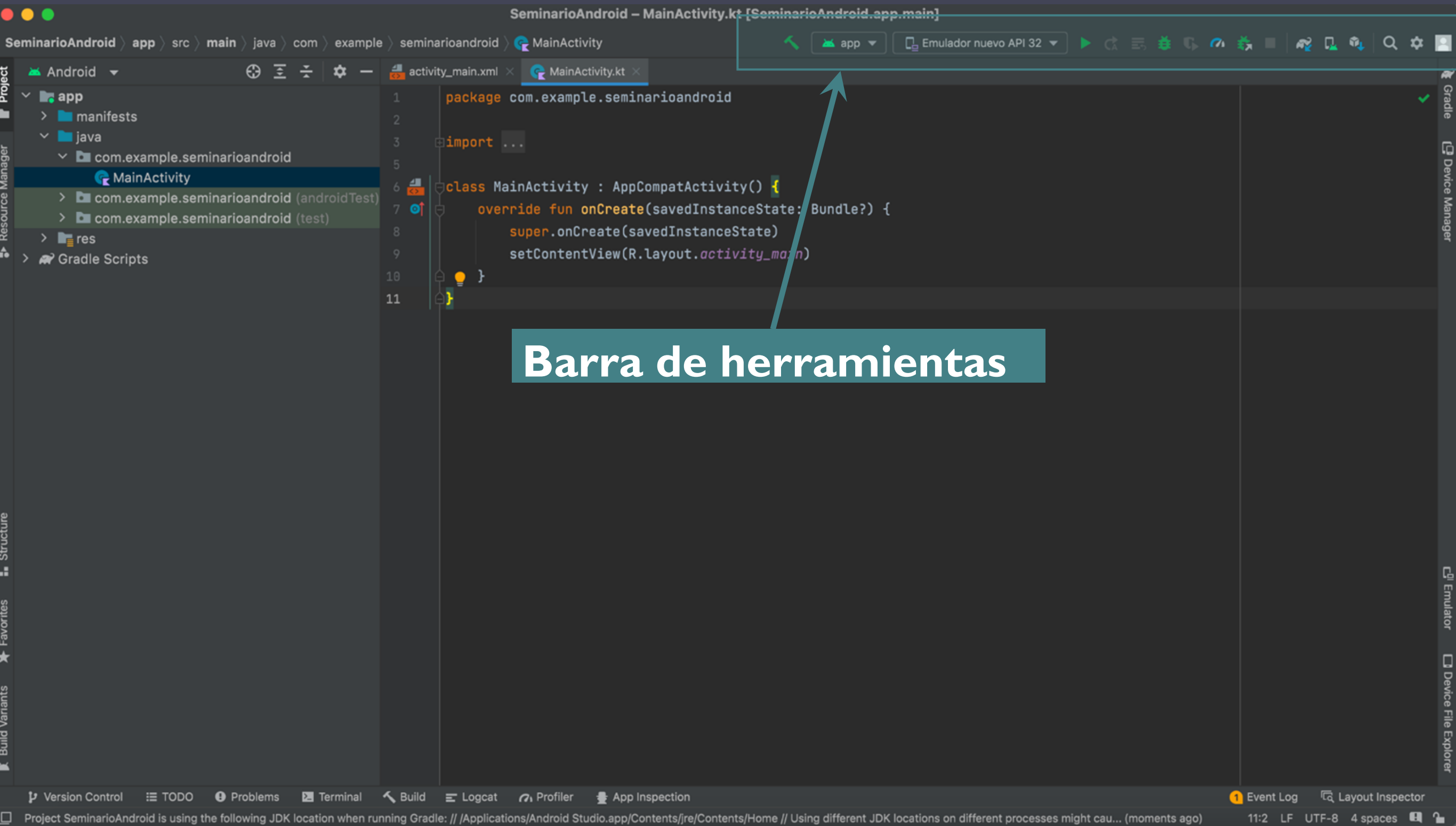
Si se selecciona *help me c*
anterior se despliega esta in

last updated: October 1, 2023

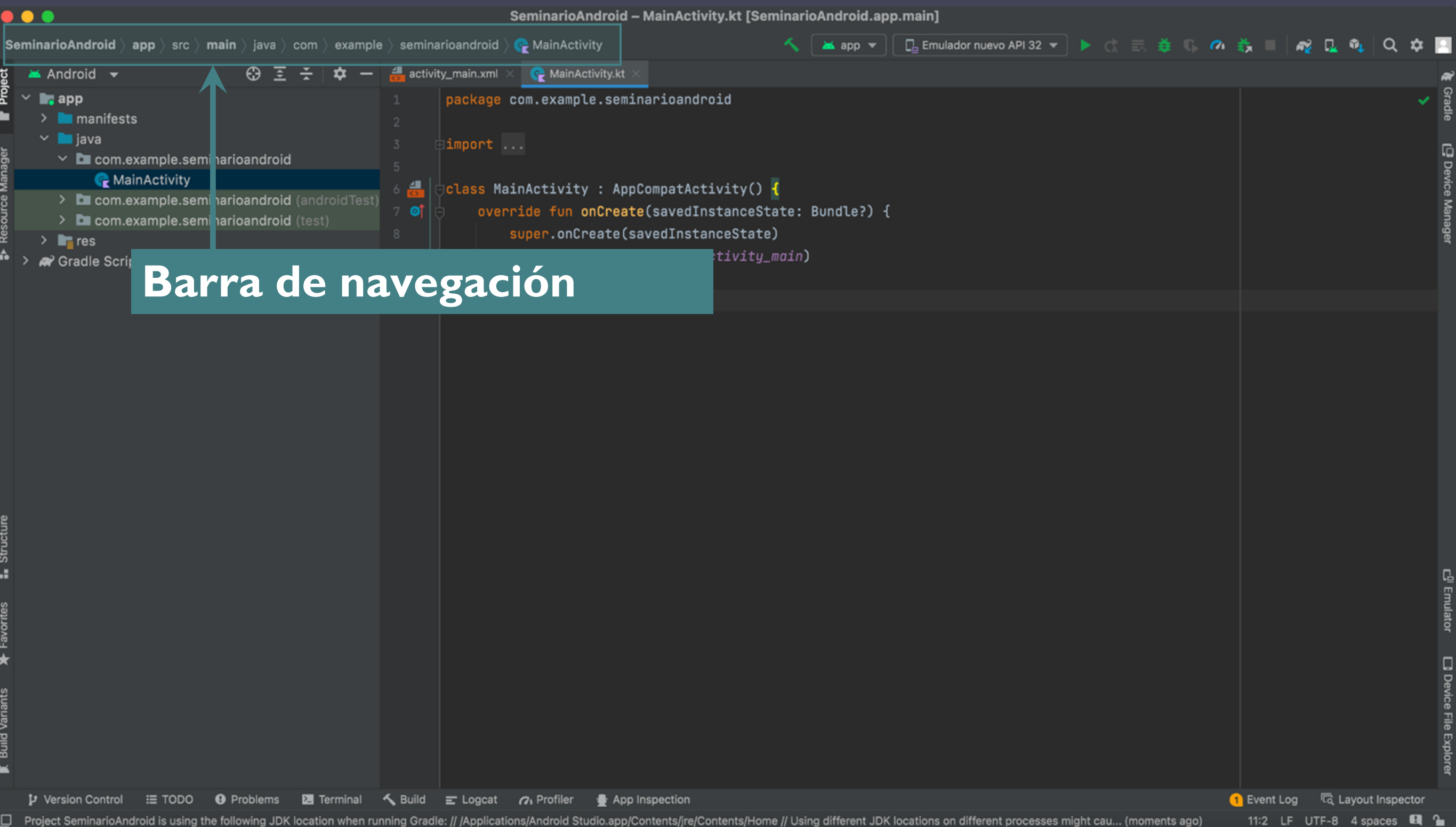
Print service enhancements

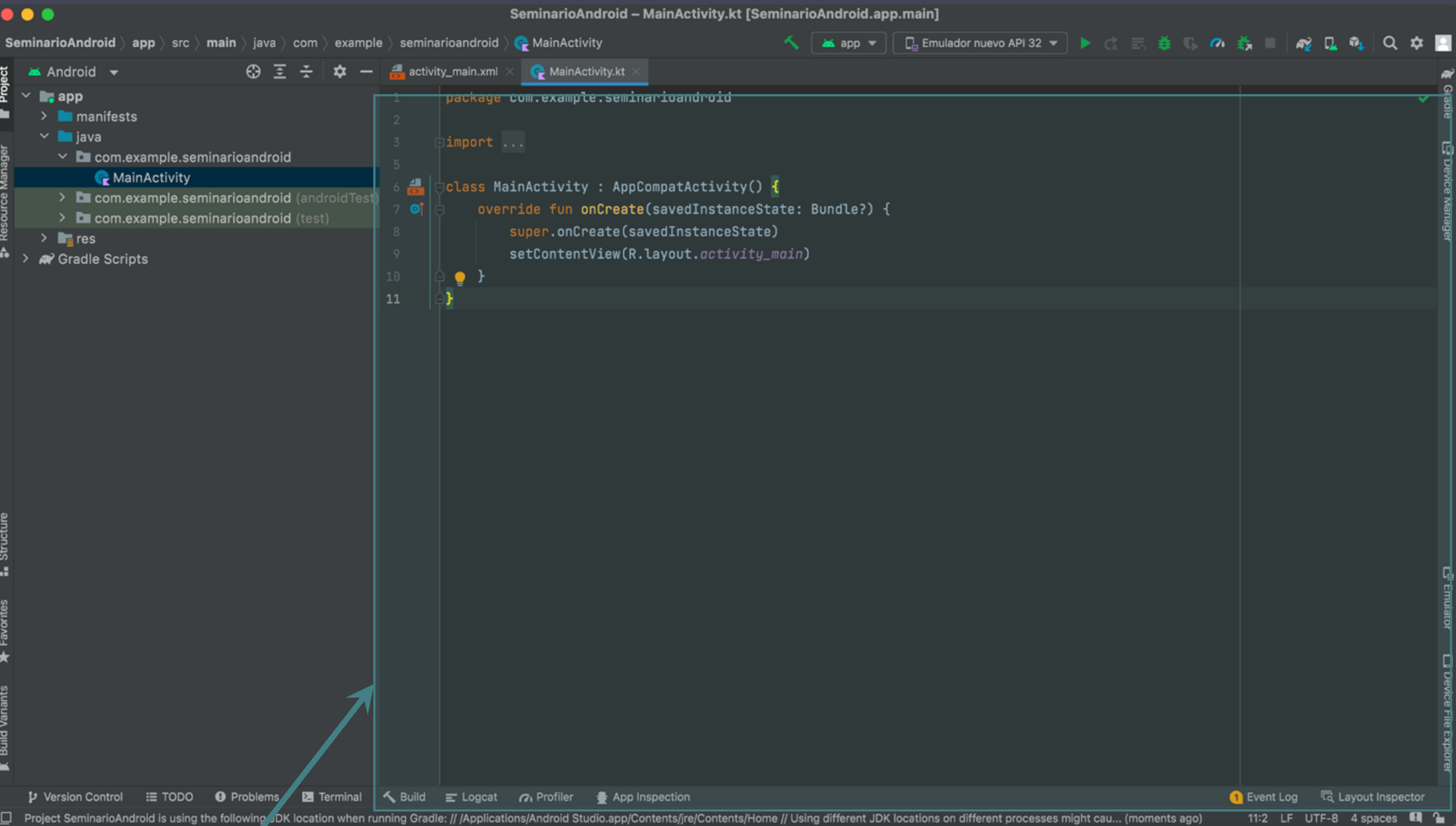


Conociendo la interfaz del IDE

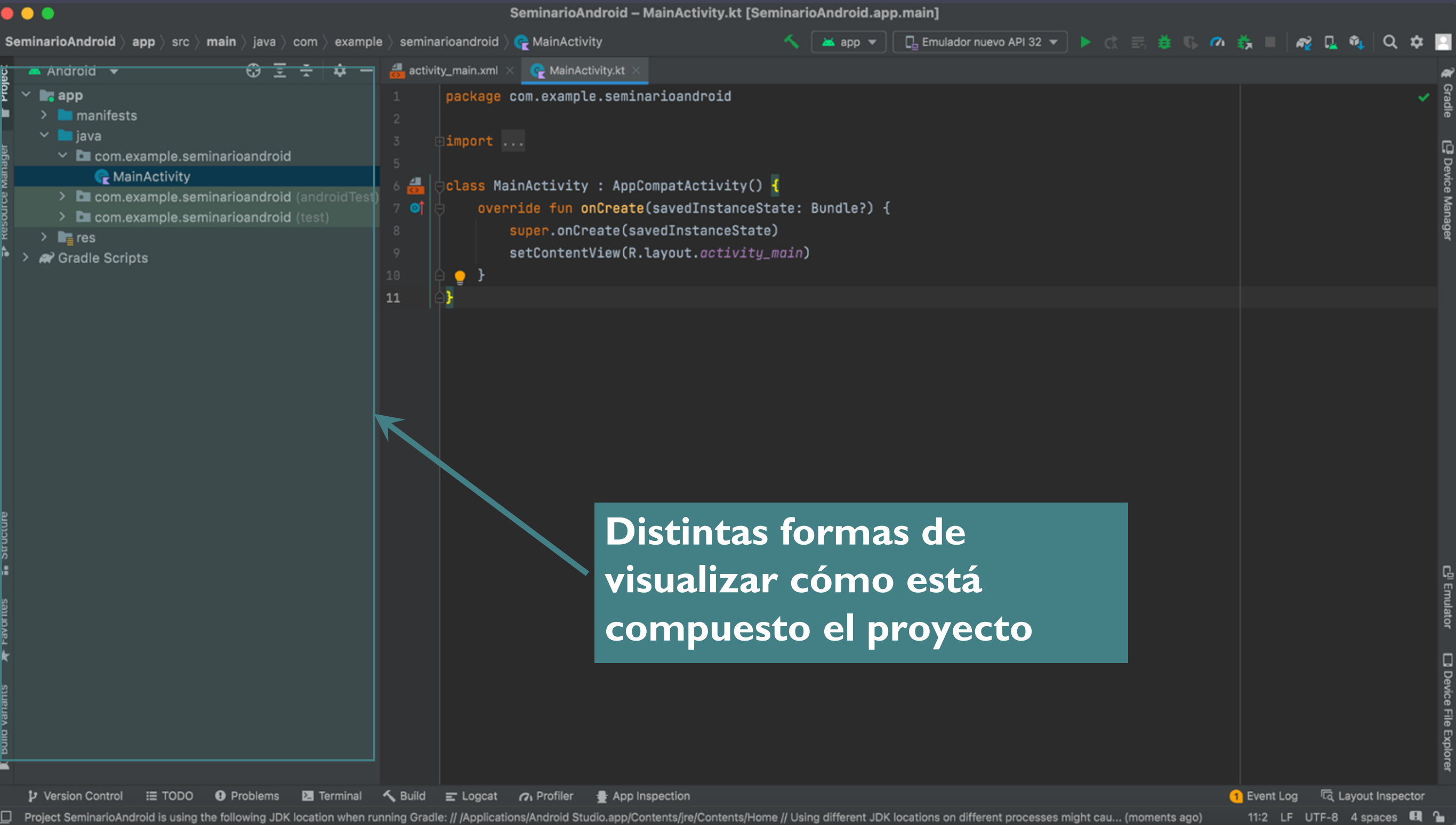


Barra de herramientas

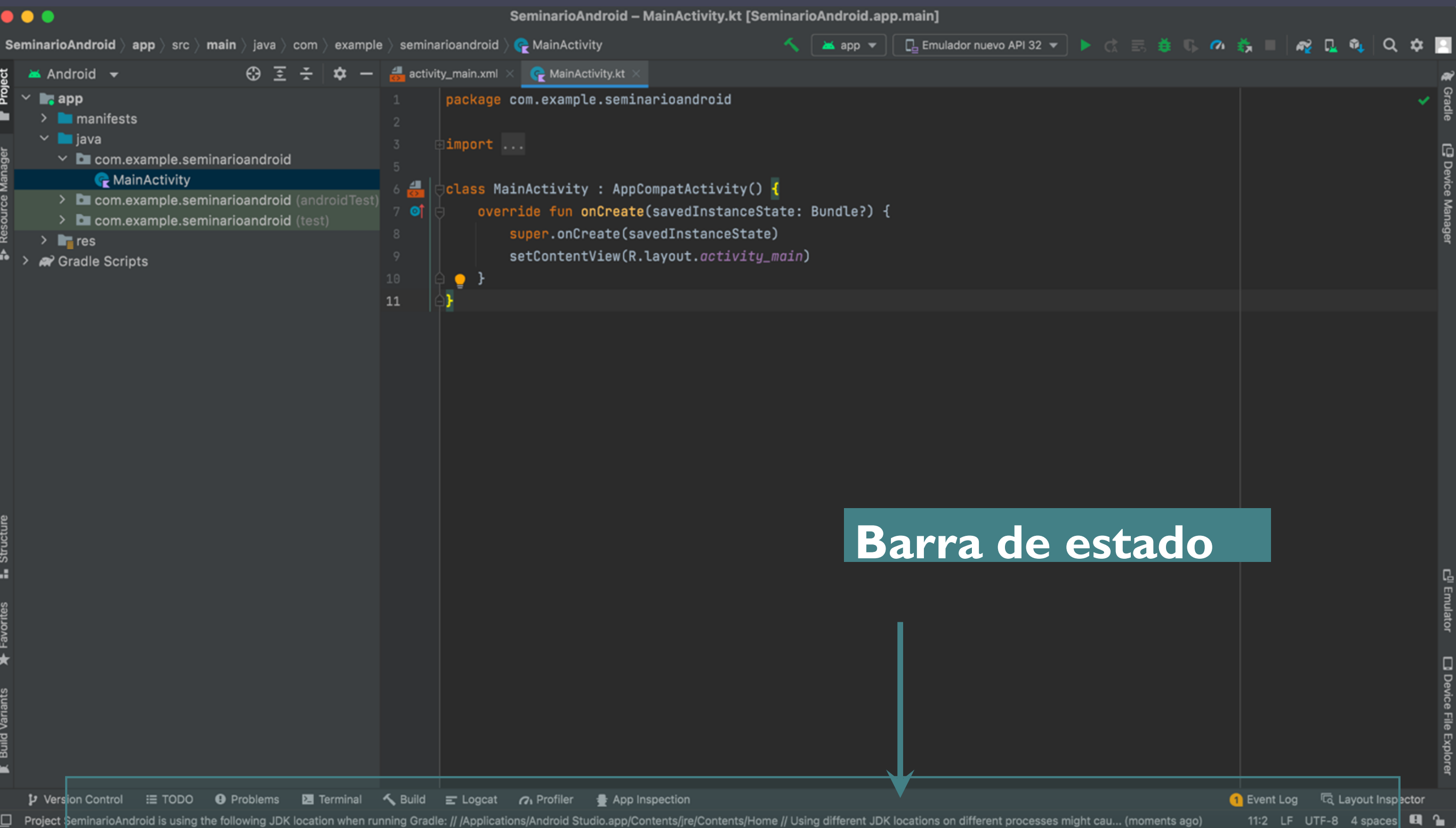




Ventana del editor



Distintas formas de
visualizar cómo está
compuesto el proyecto



Definición de la clase que constituye la Actividad

The screenshot shows the Android Studio interface for a project named "SeminarioAndroid". The Project view on the left shows the package structure: `com.example.seminarioandroid` containing `MainActivity`. The main editor displays the `MainActivity.kt` file with the following code:

```
1 package com.example.seminarioandroid
2
3 import ...
4
5
6 class MainActivity : AppCompatActivity() {
7     override fun onCreate(savedInstanceState: Bundle?) {
8         super.onCreate(savedInstanceState)
9         setContentView(R.layout.activity_main)
10    }
11 }
```

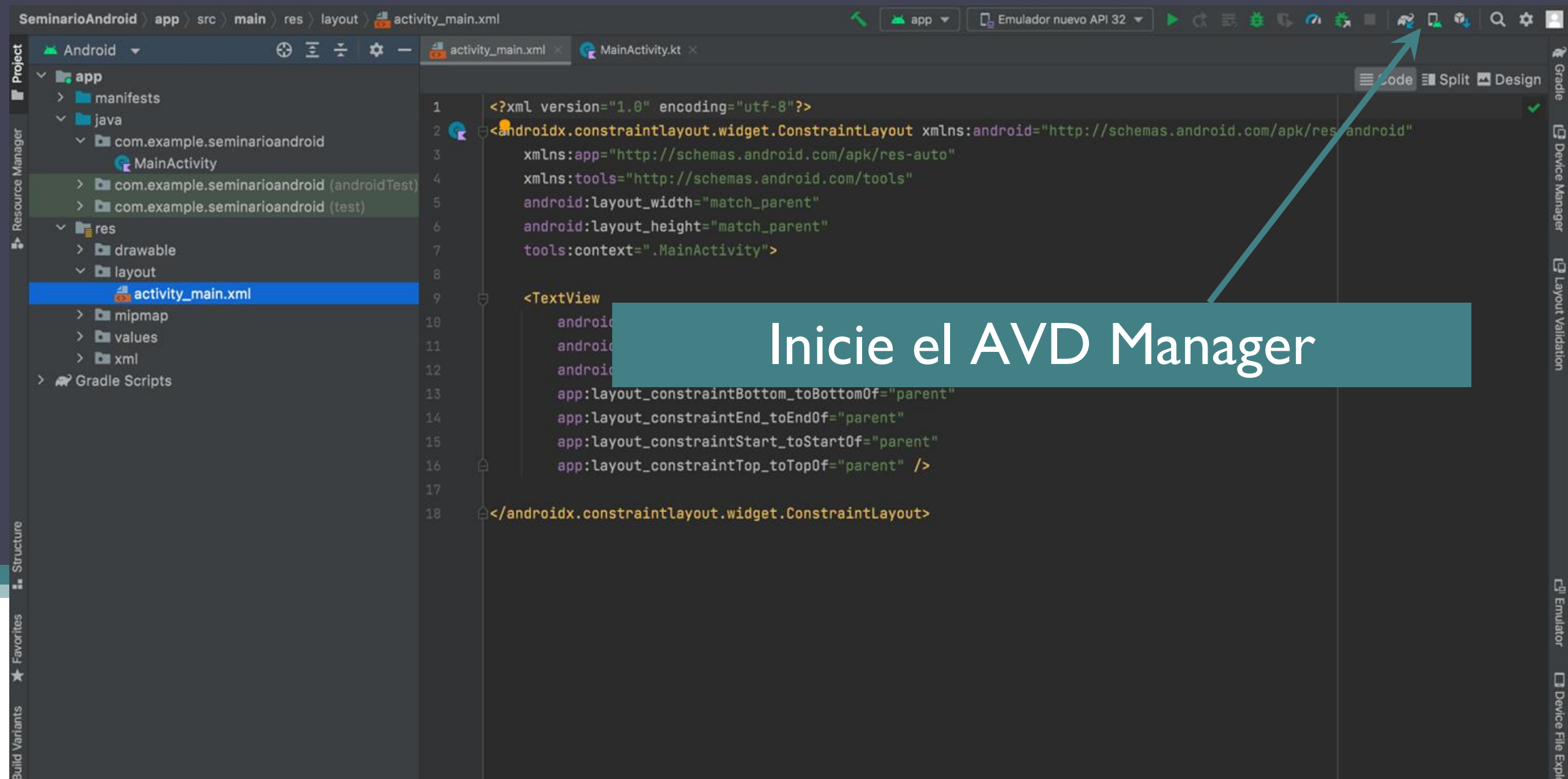
The code defines the `MainActivity` class, which inherits from `AppCompatActivity`. It overrides the `onCreate` method to call `super.onCreate(savedInstanceState)` and `setContentView(R.layout.activity_main)`.

Definición de la vista de la Actividad

The screenshot displays the Android Studio interface. On the left, the Project Manager shows the project structure with the file `activity_main.xml` selected under the `res/layout` directory. The main editor window shows the XML code for `activity_main.xml`. The code defines a `ConstraintLayout` containing a `TextView` with the text "Hello World!".

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <androidx.constraintlayout.widget.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
3     xmlns:app="http://schemas.android.com/apk/res-auto"
4     xmlns:tools="http://schemas.android.com/tools"
5     android:layout_width="match_parent"
6     android:layout_height="match_parent"
7     tools:context=".MainActivity">
8
9     <TextView
10         android:layout_width="wrap_content"
11         android:layout_height="wrap_content"
12         android:text="Hello World!"
13         app:layout_constraintBottom_toBottomOf="parent"
14         app:layout_constraintEnd_toEndOf="parent"
15         app:layout_constraintStart_toStartOf="parent"
16         app:layout_constraintTop_toTopOf="parent" />
17
18 </androidx.constraintlayout.widget.ConstraintLayout>
```


Ejecución de la aplicación en el emulador



















Crear un nuevo dispositivo virtual. Ej Pixel 2, con un SDK previamente instalado.

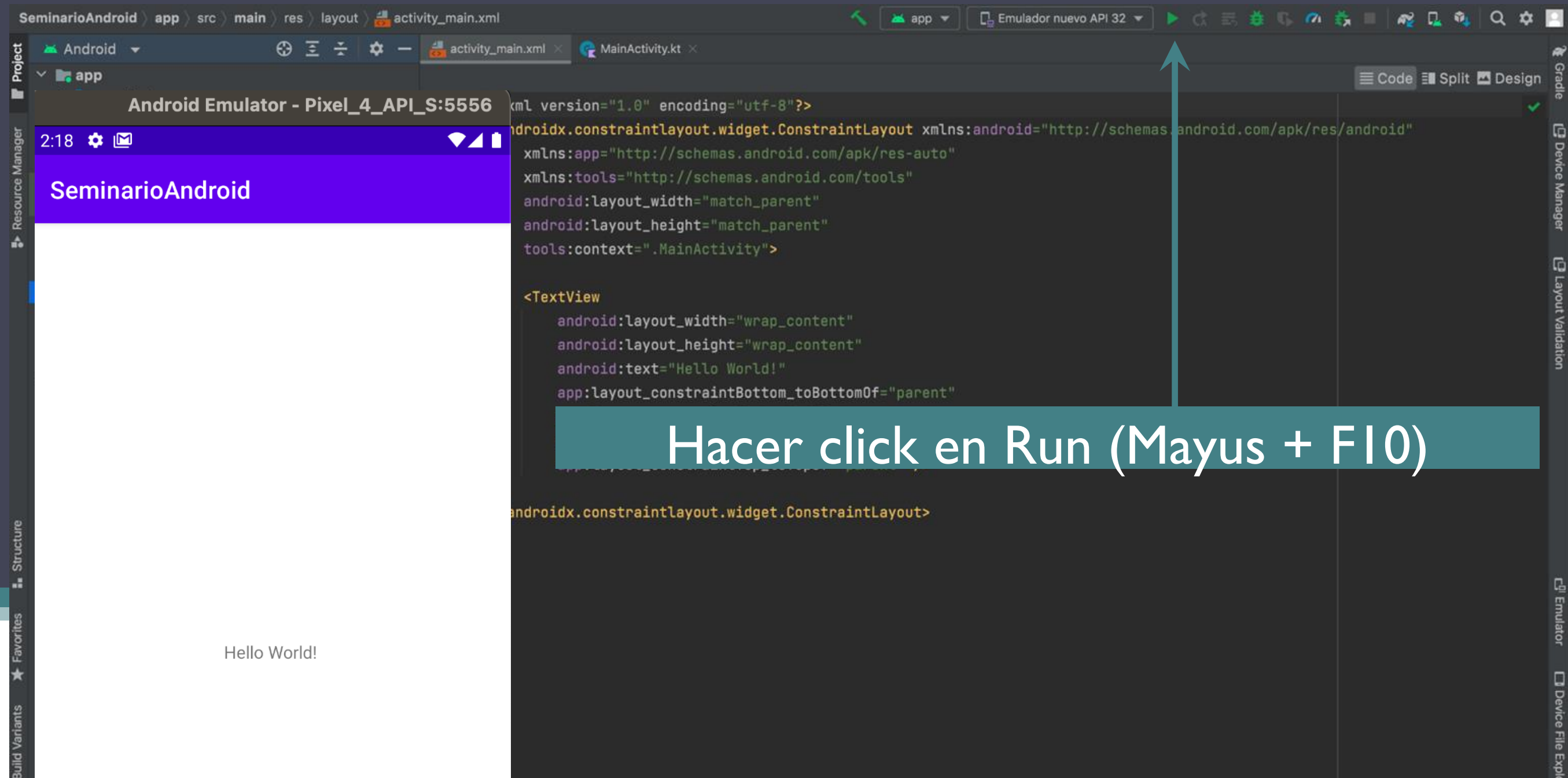
Listado de Emuladores/Dispositivos Virtuales instalados

Device Manager

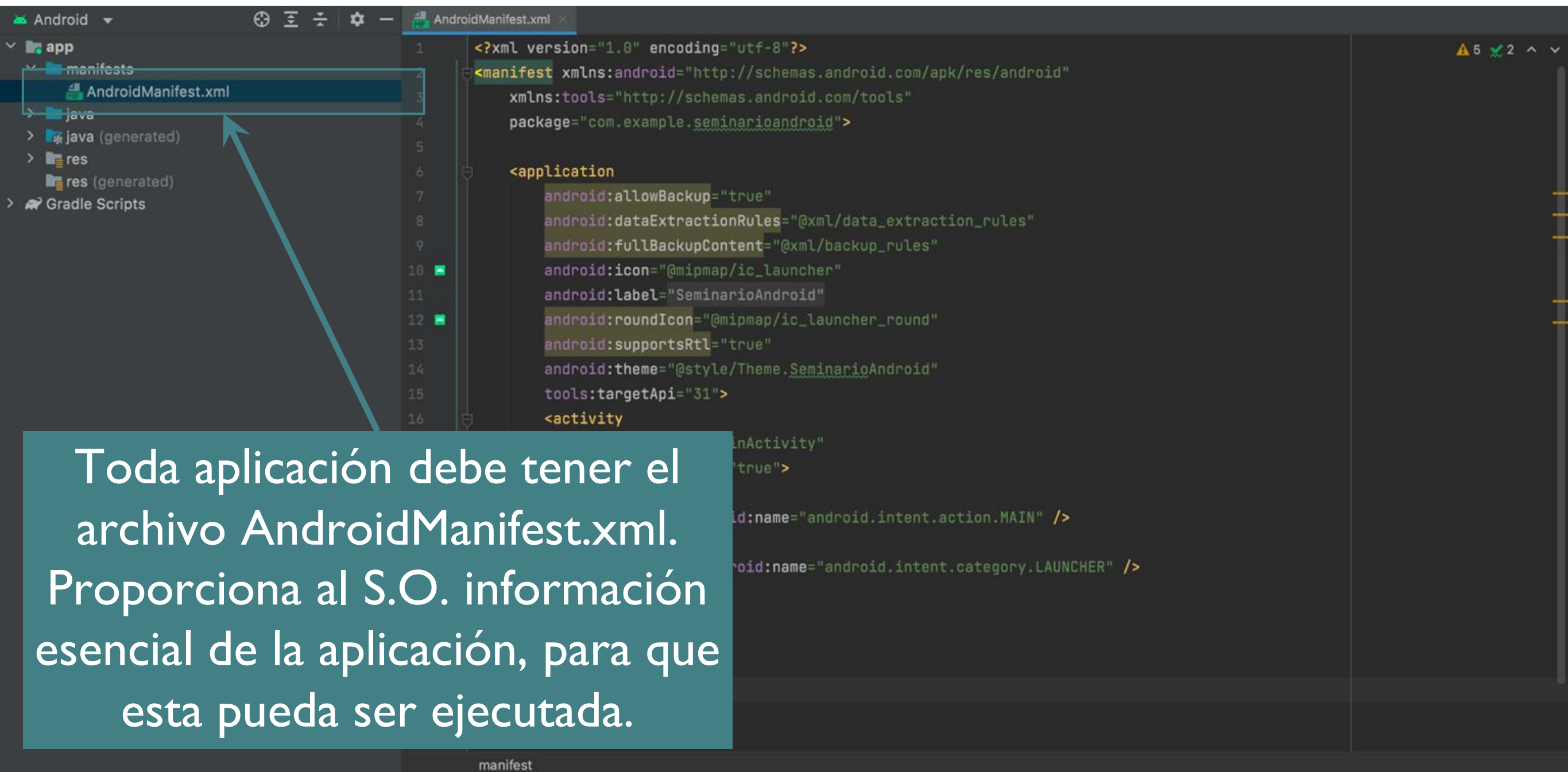
Virtual Physical

Create device ?

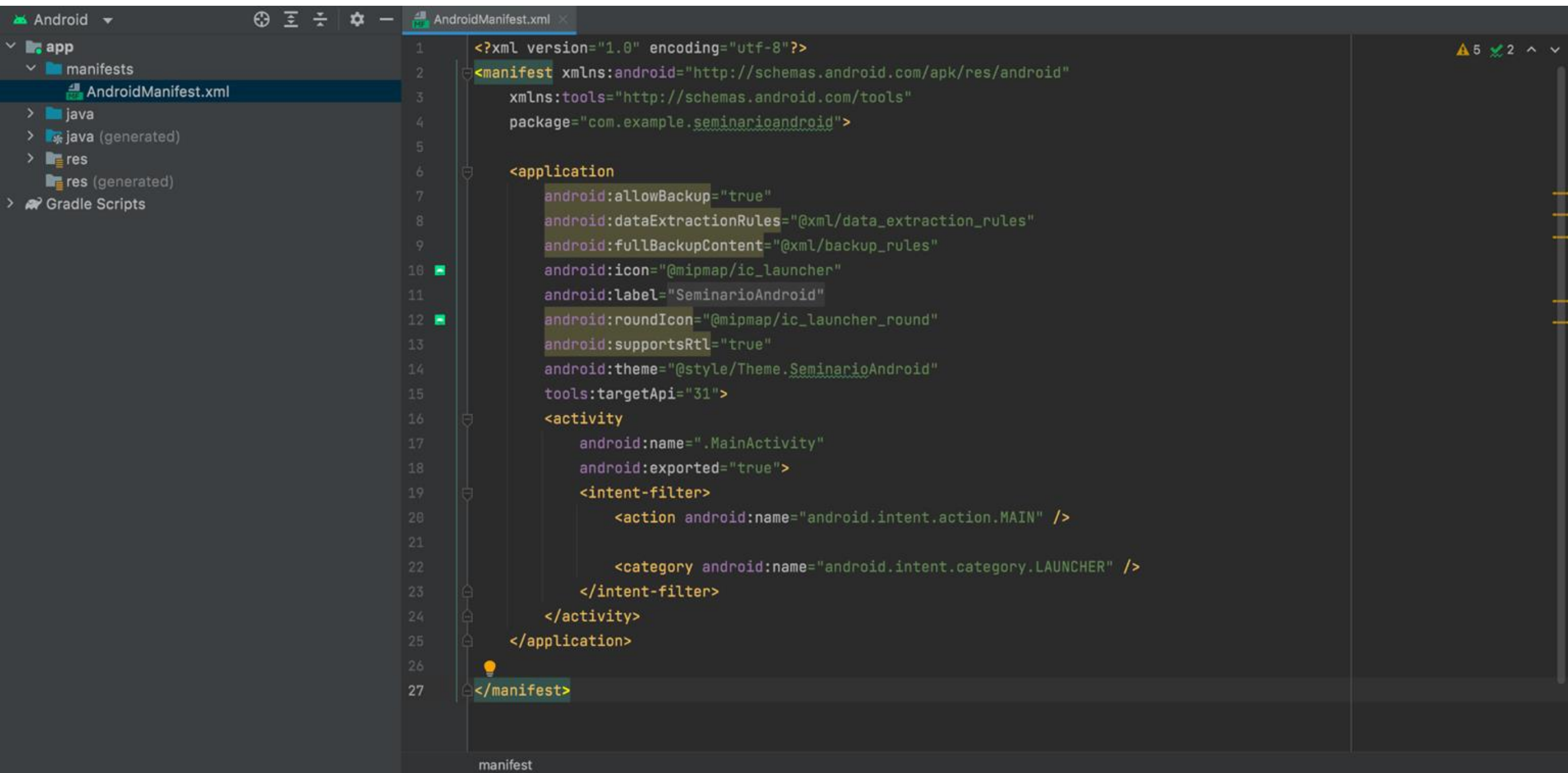
Device	API	Size on Disk	Actions
Emulador nuev... Android API 32 Goo...	32	28 GB	   
Pixel 2 API S Android 12.0 Google...	30	9.6 GB	   
Pixel 3 API 31 Android 12.0 Google...	31	0.0 MB	   
Pixel 4 API S Android 12.0 Google...	30	8.0 GB	   



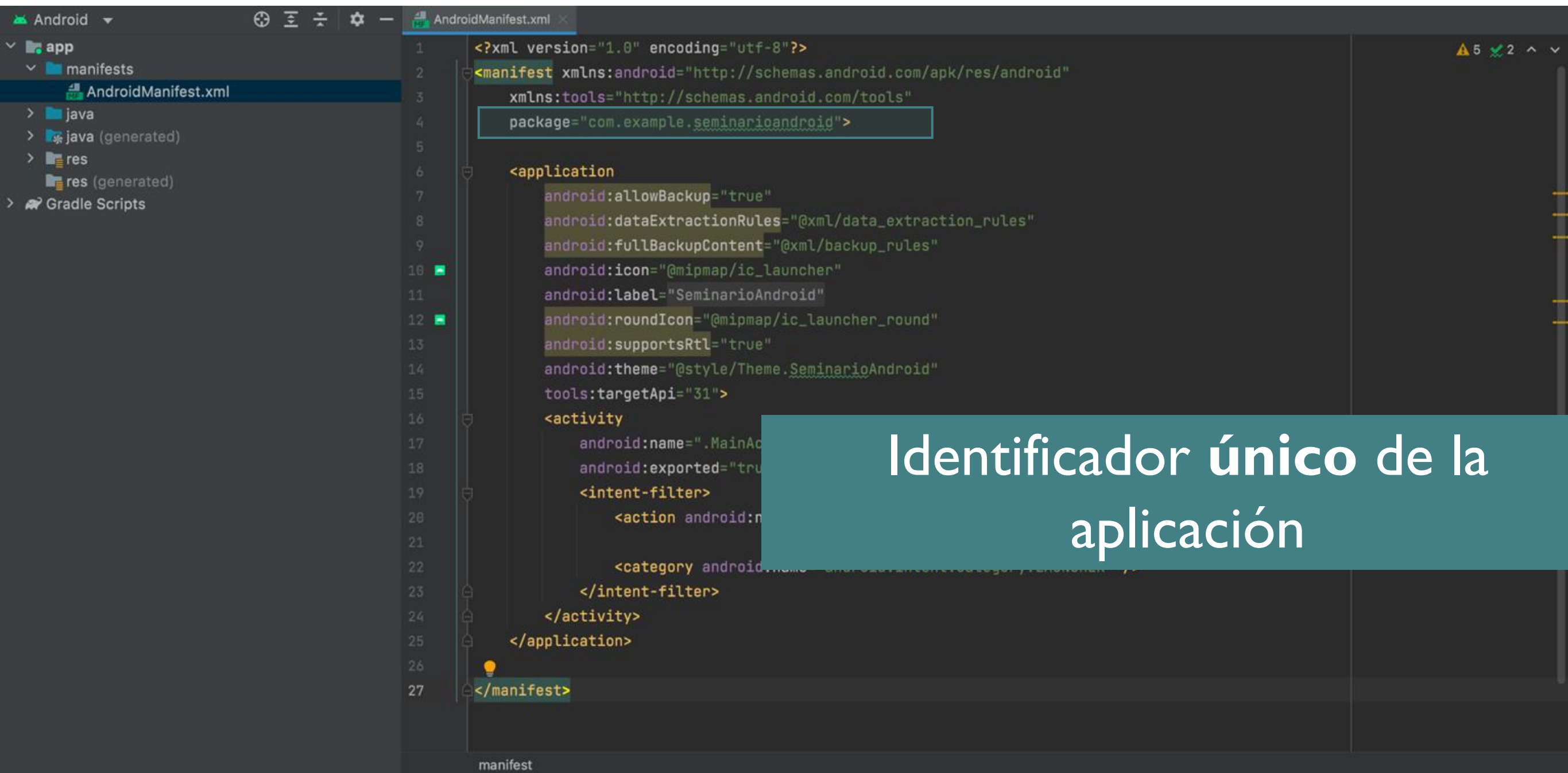
AndroidManifest.xml



AndroidManifest.xml



AndroidManifest.xml



AndroidManifest.xml



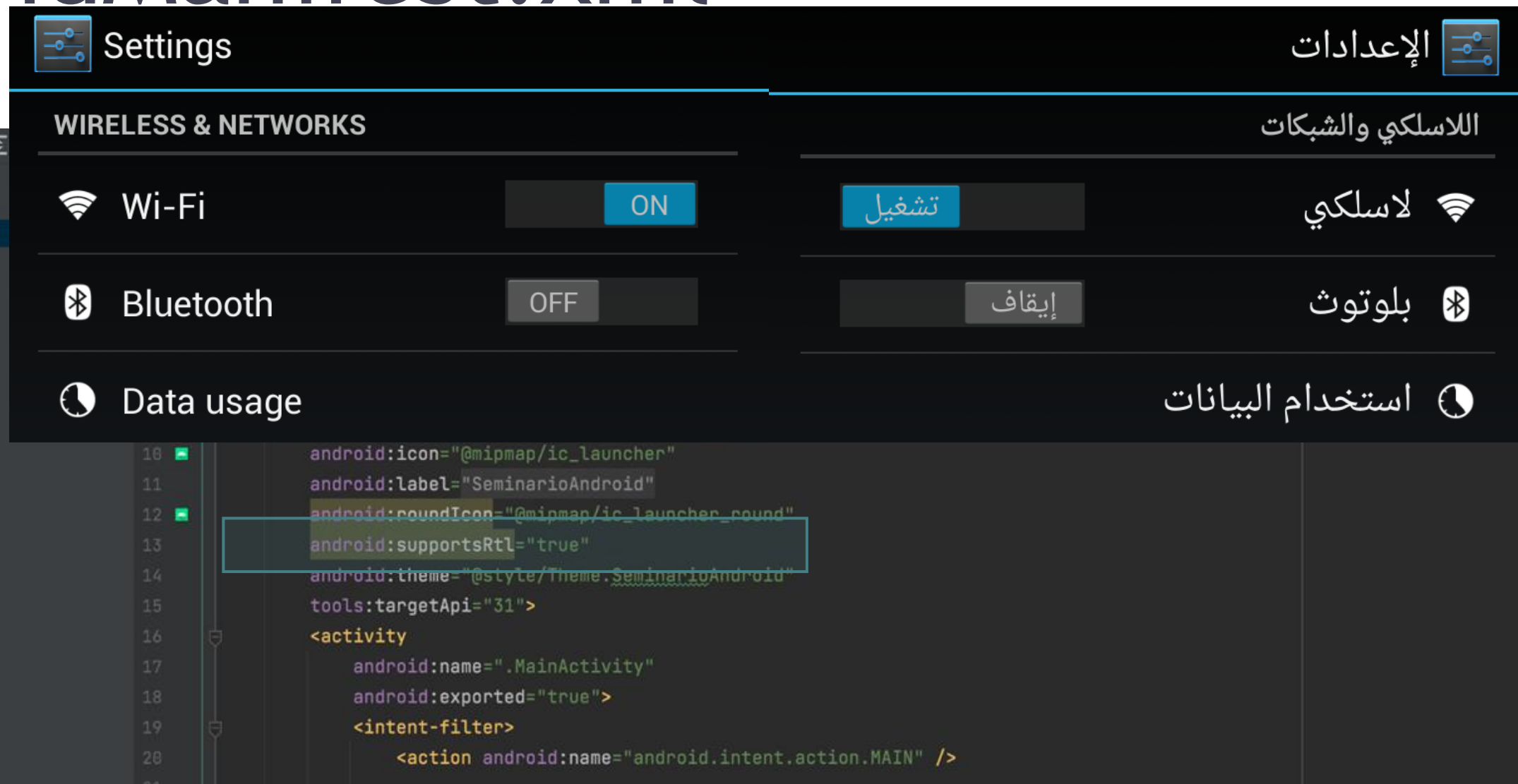
AndroidManifest.xml



AndroidManifest.xml

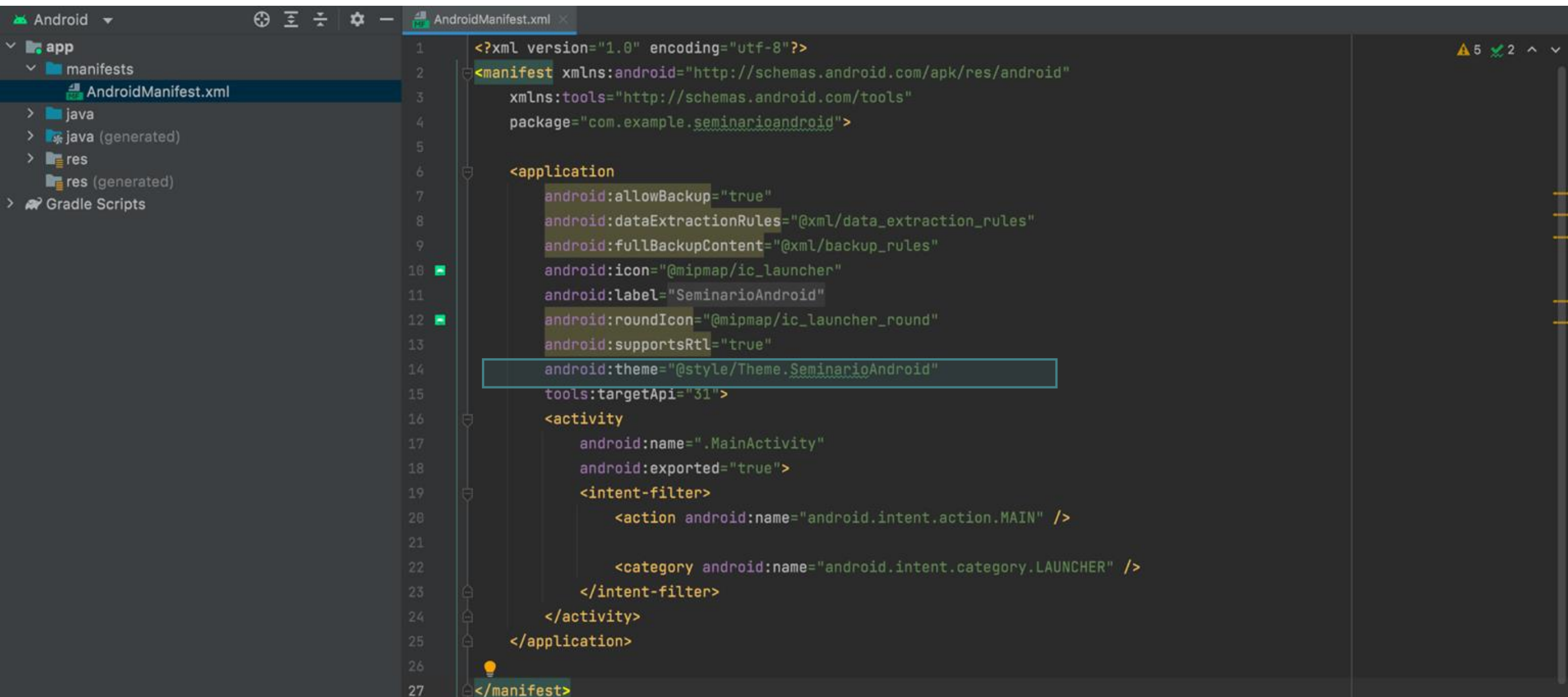


AndroidManifest.xml



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 automáticamente

AndroidManifest.xml



```
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3          xmlns:tools="http://schemas.android.com/tools"
4          package="com.example.seminarioandroid">
5
6      <application
7          android:allowBackup="true"
8          android:dataExtractionRules="@xml/data_extraction_rules"
9          android:fullBackupContent="@xml/backup_rules"
10         android:icon="@mipmap/ic_launcher"
11         android:label="SeminarioAndroid"
12         android:roundIcon="@mipmap/ic_launcher_round"
13         android:supportsRtl="true"
14         android:theme="@style/Theme.SeminarioAndroid"
15         tools:targetApi="31">
16
17         <activity
18             android:name=".MainActivity"
19             android:exported="true">
20             <intent-filter>
21                 <action android:name="android.intent.action.MAIN" />
22
23                 <category android:name="android.intent.category.LAUNCHER" />
24             </intent-filter>
25         </activity>
26     </application>
27 </manifest>
```

Tema de estilos de la aplicación.
En clases posteriores estudiaremos este tema

AndroidManifest.xml

Además, describe cómo está compuesta la aplicación.

Más adelante estudiaremos que existen 4 tipos de “componentes de aplicación” posibles (Activities, Services, Broadcast receivers, Content Providers)

```

android:fullBackupContent="@xml/backup_rules"
android:icon="@mipmap/ic_launcher"
android:label="@string/SeminarioAndroid"
android:roundIcon="@mipmap/ic_launcher_round"
android:supportsRtl="true"
android:theme="@style/Theme.SeminarioAndroid"
tools:targetApi="31">

<activity
    android:name=".MainActivity"
    android:exported="true">
    <intent-filter>
        <action android:name="android.intent.action.MAIN" />

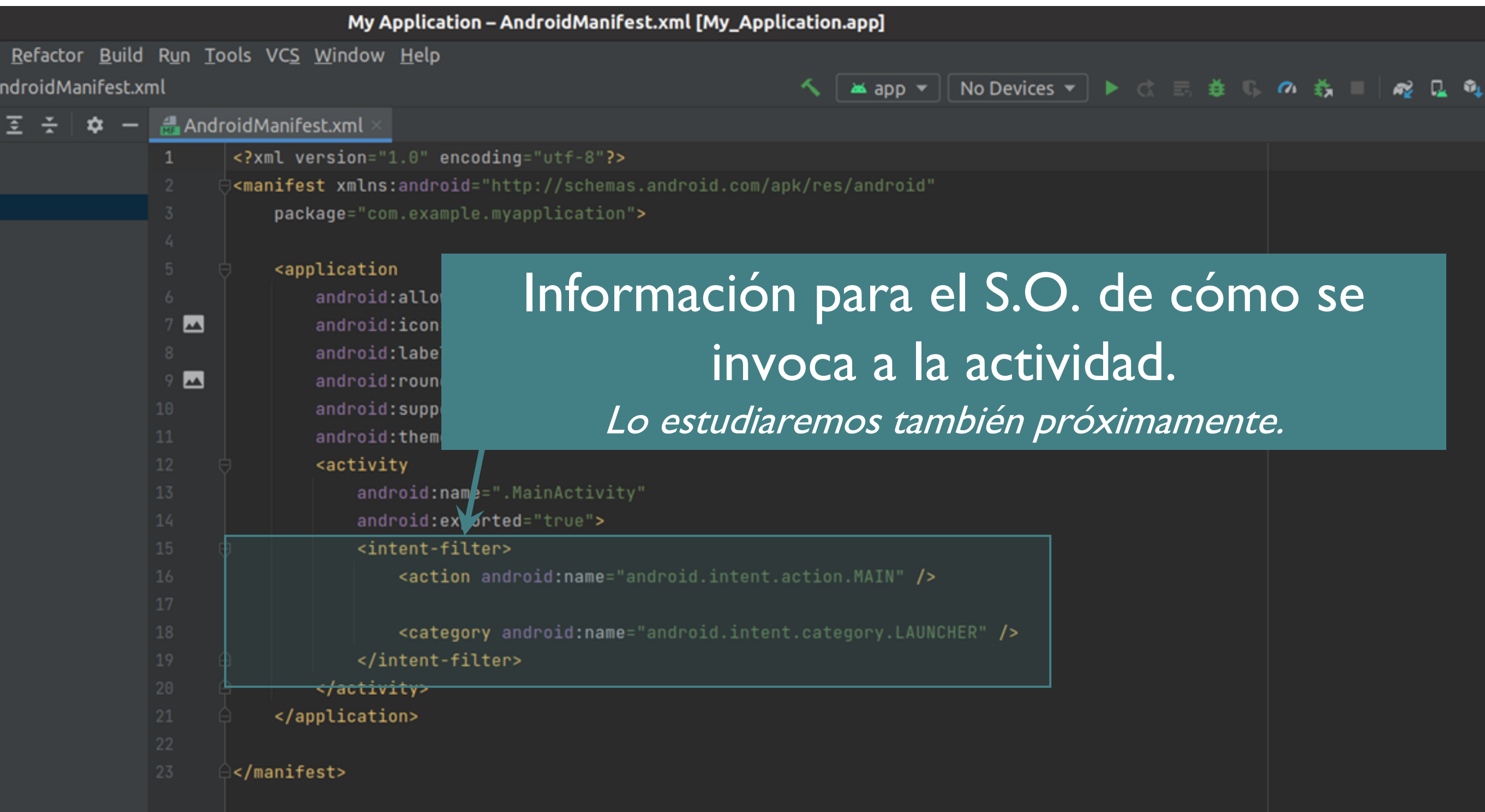
        <category android:name="android.intent.category.LAUNCHER" />
    </intent-filter>
</activity>
</application>

```

</manifest>

manifest

AndroidManifest.xml



The screenshot shows an IDE window titled "My Application – AndroidManifest.xml [My_Application.app]". The menu bar includes "Refactor", "Build", "Run", "Tools", "VCS", "Window", and "Help". The toolbar shows icons for navigation and development. The file "AndroidManifest.xml" is open, displaying the following XML code:

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3     package="com.example.myapplication">
4
5     <application
6         android:allowBackup="true"
7         android:icon="@mipmap/ic_launcher"
8         android:label="@string/app_name"
9         android:roundIcon="@mipmap/ic_launcher_round"
10        android:supportRtl="true"
11        android:theme="@style/Theme.AppCompat"
12    >
13        <activity
14            android:name=".MainActivity"
15            android:exported="true">
16            <intent-filter>
17                <action android:name="android.intent.action.MAIN" />
18                <category android:name="android.intent.category.LAUNCHER" />
19            </intent-filter>
20        </activity>
21    </application>
22
23 </manifest>
```

A teal text box with white text is overlaid on the right side of the code, stating: "Información para el S.O. de cómo se invoca a la actividad. Lo estudiaremos también próximamente." An arrow points from this text box to the `android:exported="true"` attribute in the `<activity>` tag.

Permisos de usuario en AndroidManifest.xml

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

```
<action android:name="android.intent.action.MAIN" />

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

<uses-permission android:name="
```

```
android.permission.ACCEPT_HANDOVER
android.permission.ACCESS_BACKGROUND_LOCATION
android.permission.ACCESS_BLOBS_ACROSS_USERS
android.permission.ACCESS_CHECKIN_PROPERTIES
android.permission.ACCESS_COARSE_LOCATION
android.permission.ACCESS_FINE_LOCATION
android.permission.ACCESS_LOCATION_EXTRA_COMMANDS
android.permission.ACCESS_MEDIA_LOCATION
android.permission.ACCESS_MOCK_LOCATION
android.permission.ACCESS_NETWORK_STATE
android.permission.ACCESS_NOTIFICATION_POLICY
android.permission.ACCESS_SURFACE_FLINGER
Press ↵ to insert, → to replace
```

Permisos de usuario en AndroidManifest.xml

Gestión de permisos antes de Android 6

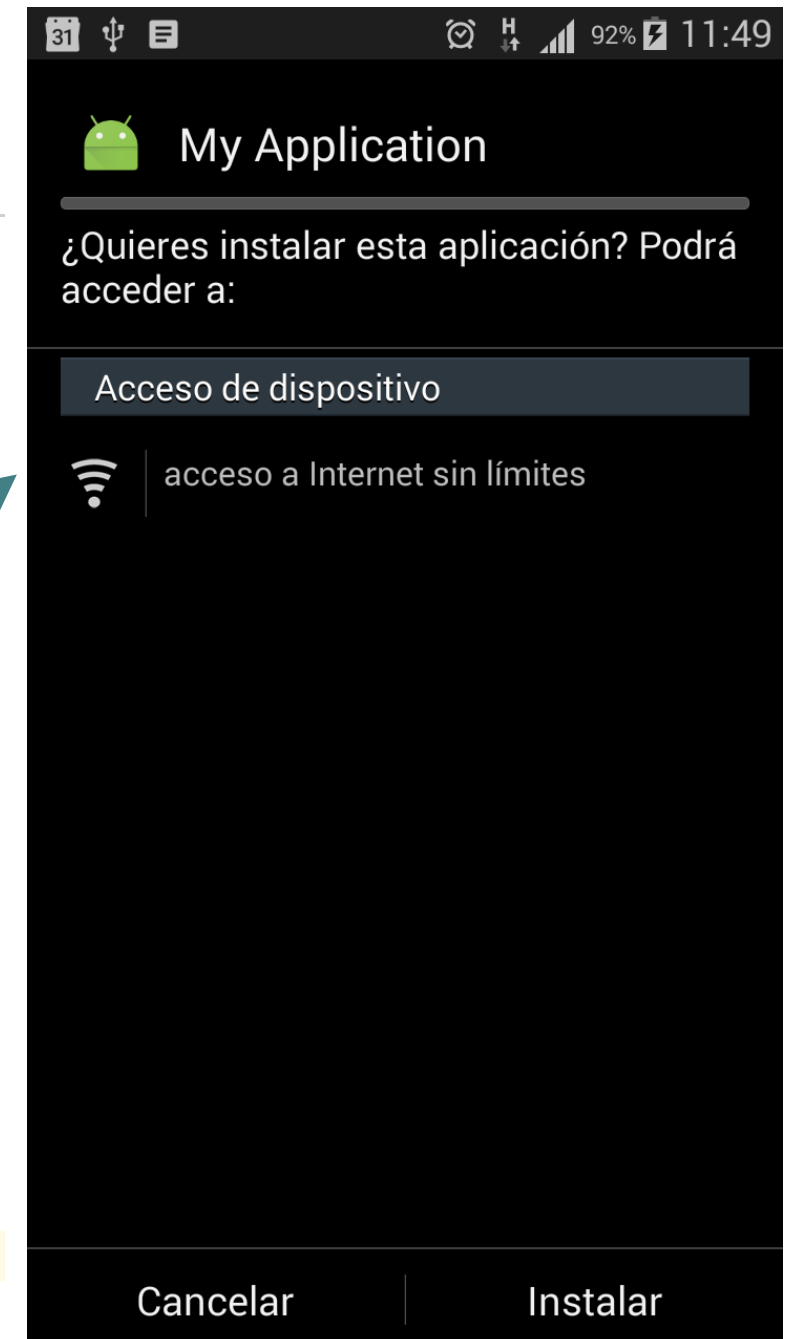
```
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.ldelia.myapplication">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:theme="@style/AppTheme">

        <activity
            android:name=".MainActivity"
            android:label="@string/app_name">
            <action android:name="android.intent.action.MAIN" />
            <category android:name="android.intent.category.LAUNCHER" />
        </activity>

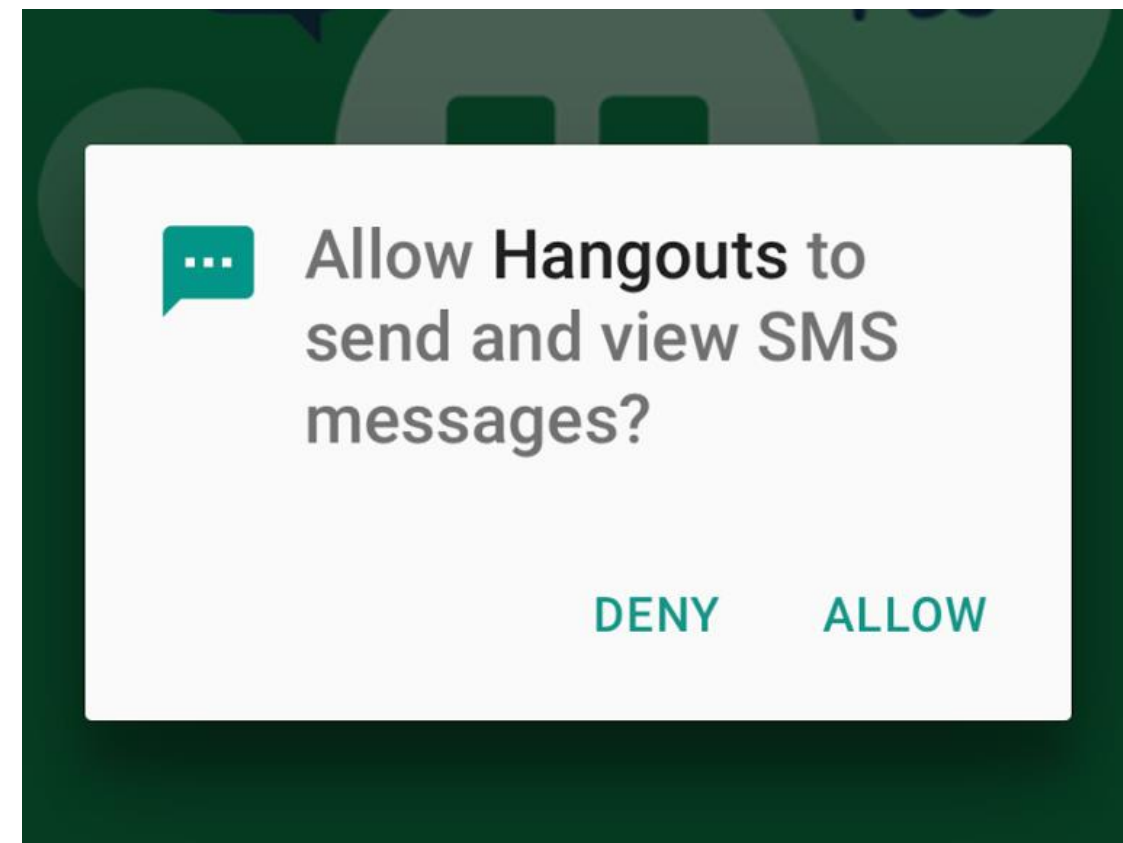
        <uses-permission android:name="android.permission.INTERNET" />
    </application>
</manifest>
```

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



Durante el curso se seguirá analizando el contenido del archivo `AndroidManifest`, a medida que se introduzcan nuevos conceptos