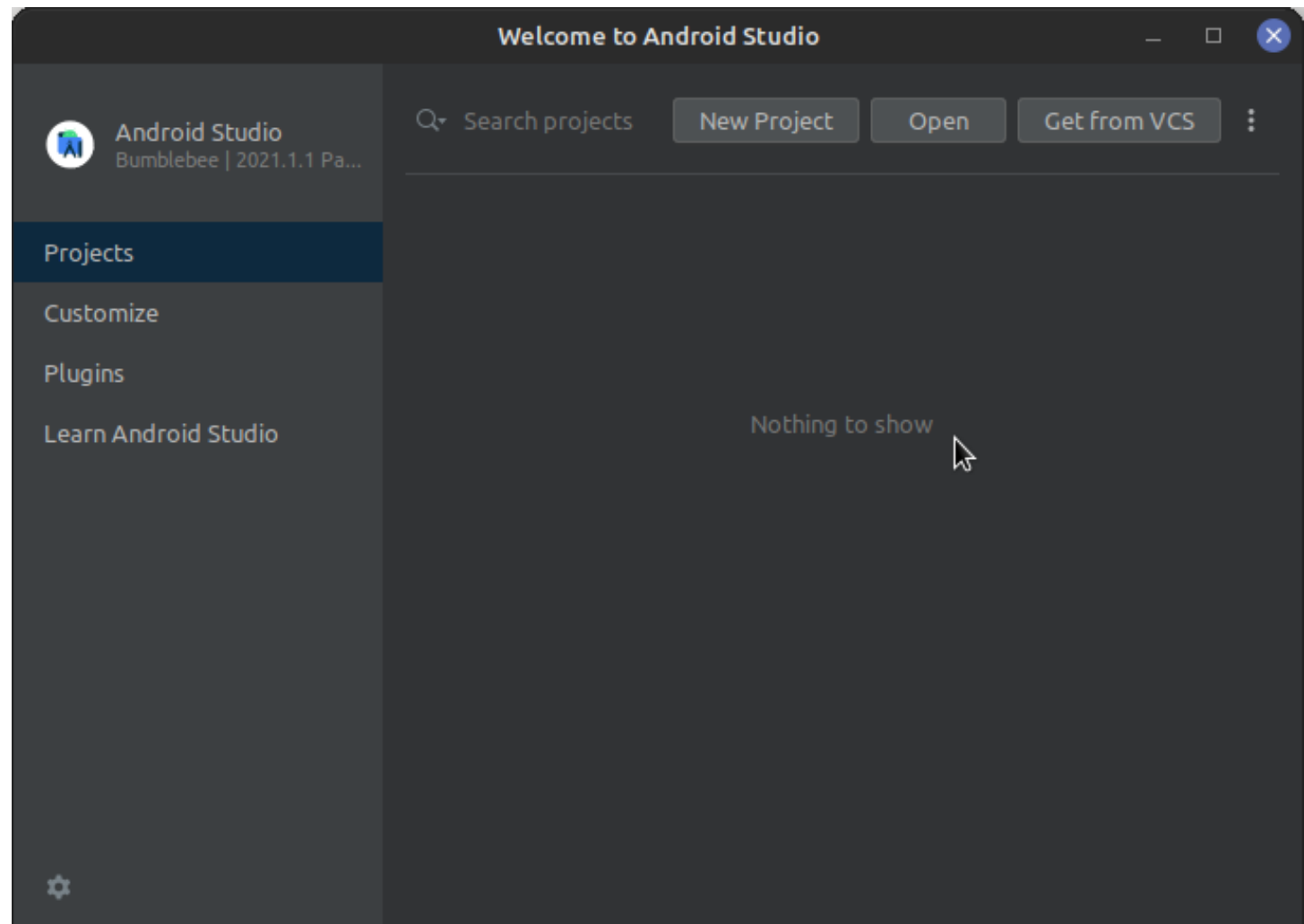


Android Studio

Corso di
Programmazione di Dispositivi Mobili
prof. Ignazio Gallo



What's AndroidStudio



...dal 2015

- Android Studio is the official **Integrated Development Environment** (IDE) for Android app development.
- Features
 - A flexible Gradle-based build system
 - A fast and feature-rich emulator
 - A unified environment where you can develop for all Android devices
 - Code templates and GitHub integration
 - Extensive testing tools and frameworks
 - ...

<https://developer.android.com/studio/intro>

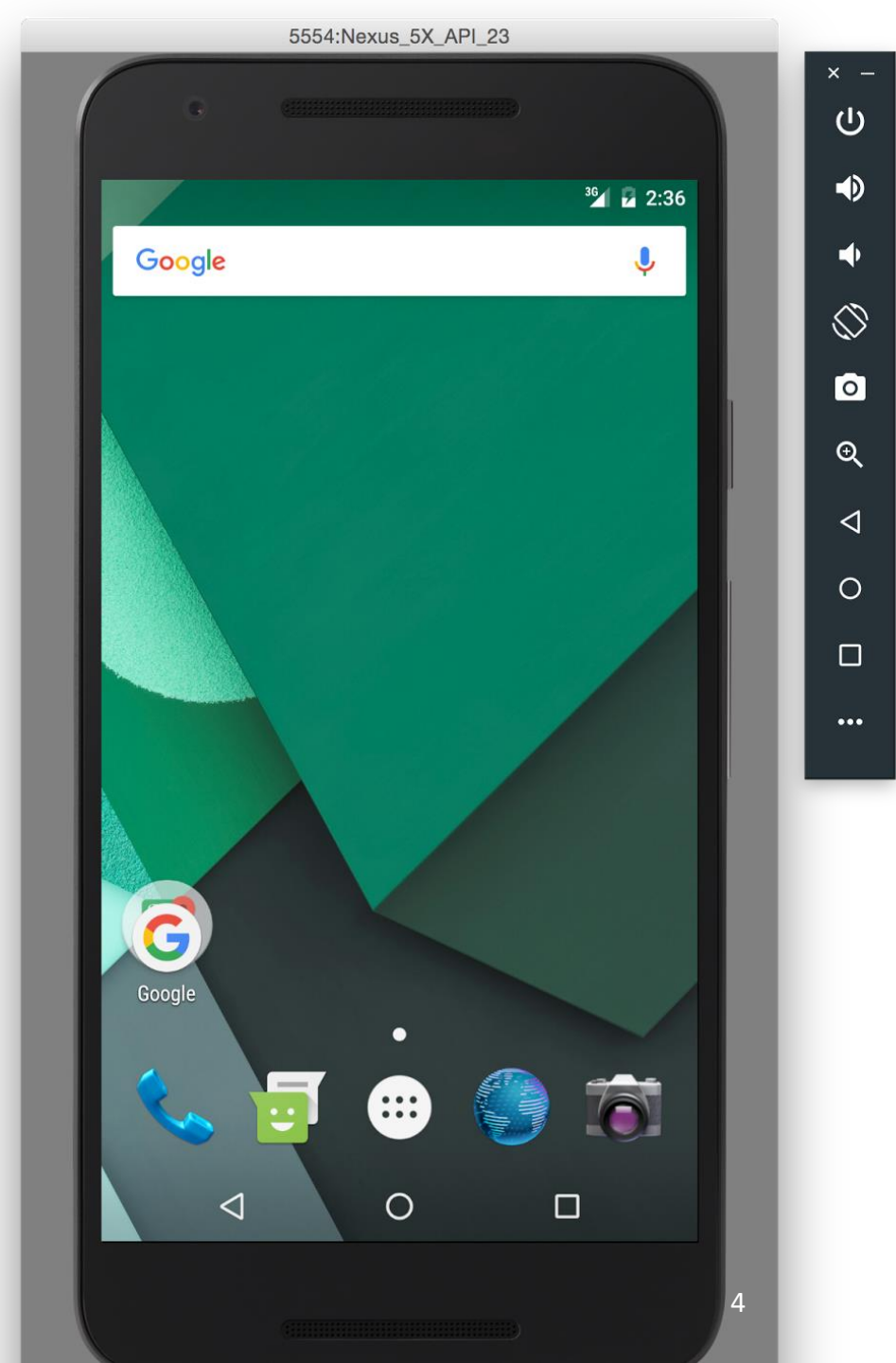
Steps

- Install **Java**
- Download and install Android Studio.
- Open Android Studio and follow the setup wizard to install any necessary SDK tools.
- Android Studio provides the **fastest tools** for building apps on every type of Android device.
- SDK home:
 - Windows: \Users\<user>\sdk
 - Mac OSX: /Users/<user>/Library/Android/sdk
 - Linux: /home/<user>/Android/Sdk



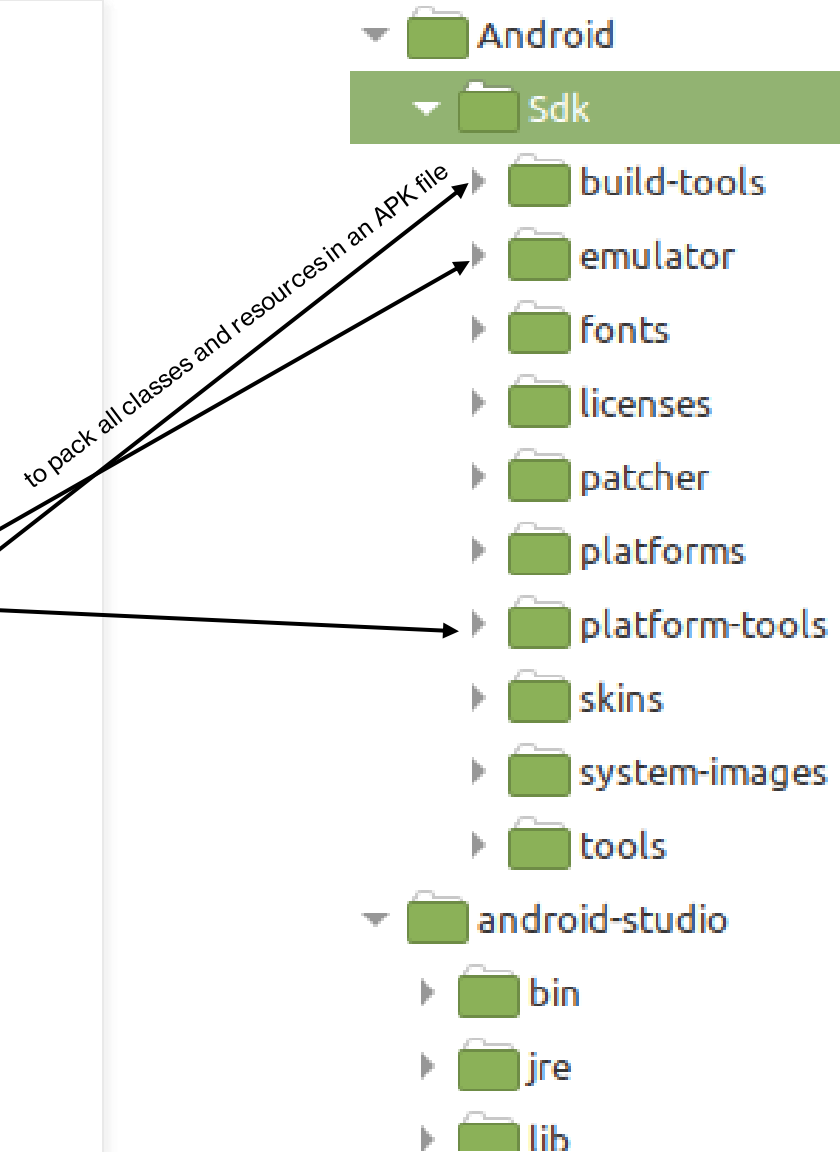
Android SDK

- The **Android Software Development Kit** (SDK) includes a comprehensive set of development tools.
 - debugger,
 - libraries,
 - handset emulator,
 - documentation, sample code, and tutorials.
- Android SDK Platform **Tools**
 - **Android Debug Bridge** (ADB) is a tool to run commands on a connected Android device (**adb** daemon on the device, and the **adb** client)



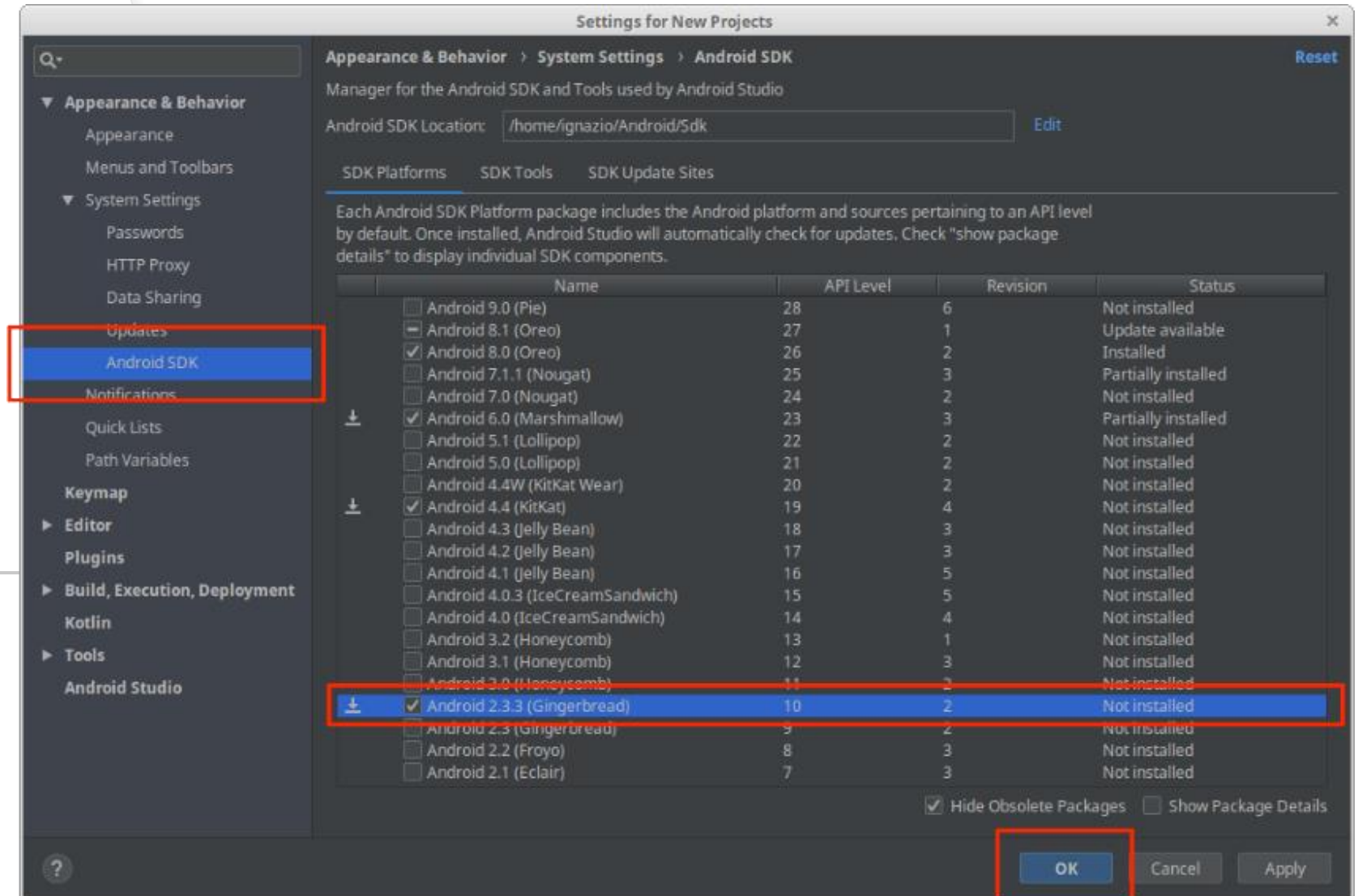
Android SDK

- is a software development kit
- includes a comprehensive set of development tools.
 - **Debugger (adb)**, libraries, a handset **emulator**,
 - documentation, sample code, tutorials, **aapt**, ...
 - Android SDK **Command-Line Tools**
 - Android SDK Build Tools
 - Android SDK Platform Tools
 - Android Emulator



Adding a platform

Select: File > Settings...





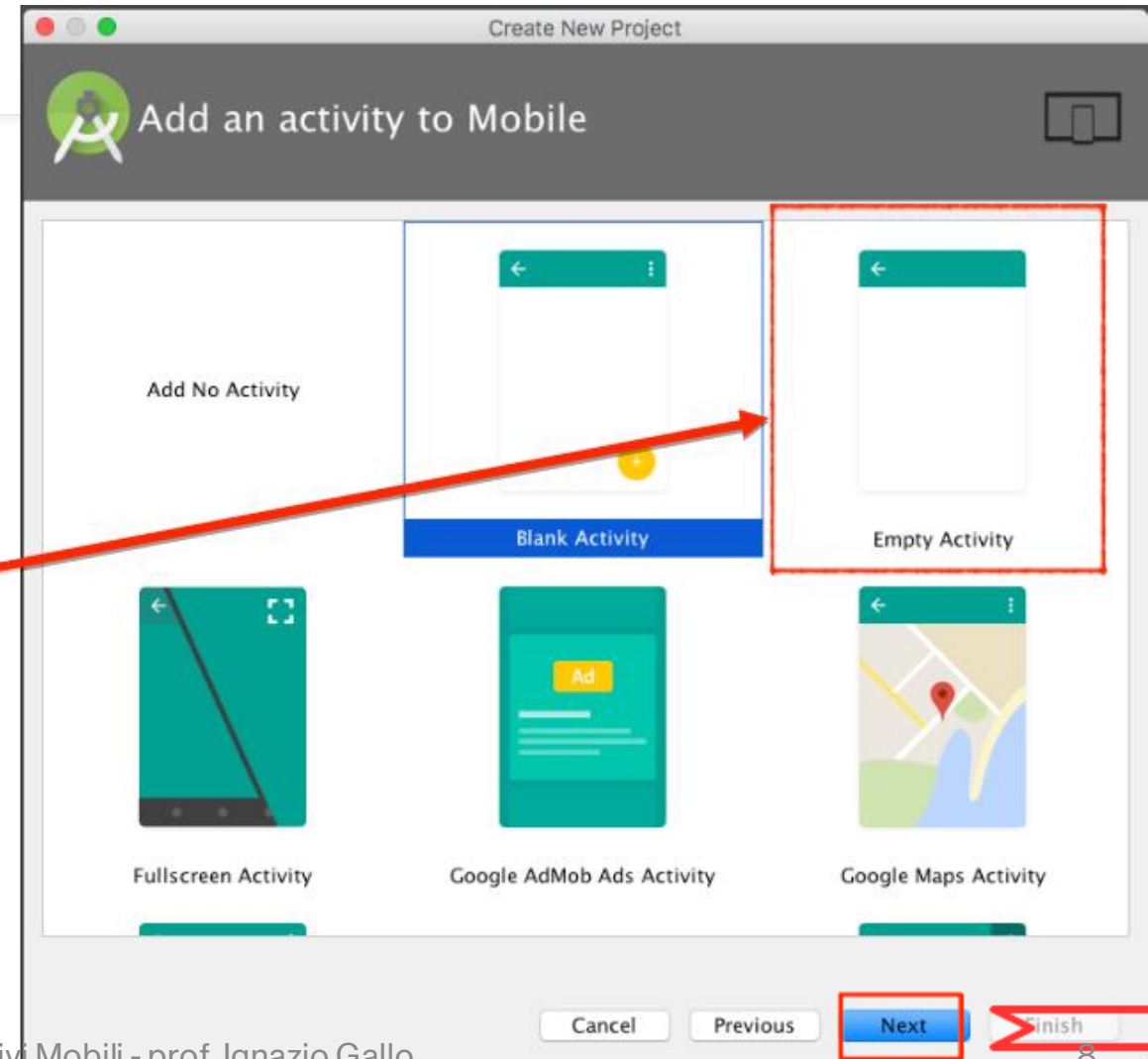
HelloWorld App

Create a simple App to understand AndroidStudio

Setup wizard

- An activity is a “starting point” for an application.
- It provides a GUI allowing the user to interact with the app.
- We start with a “blank activity”.

Select: File > New > New Project...



Configure the project

- Select the best configuration for all the options highlighted in red
- Finish

Create New Project

Configure your project

Name
Hello World

Package name
it.uninsubria.helloworld

Save location
/home/ignazio/AndroidProjects/HelloWorld

Language
Java

Empty Activity

Minimum API level
API 15: Android 4.0.3 (IceCreamSandwich)

Creates a new empty activity

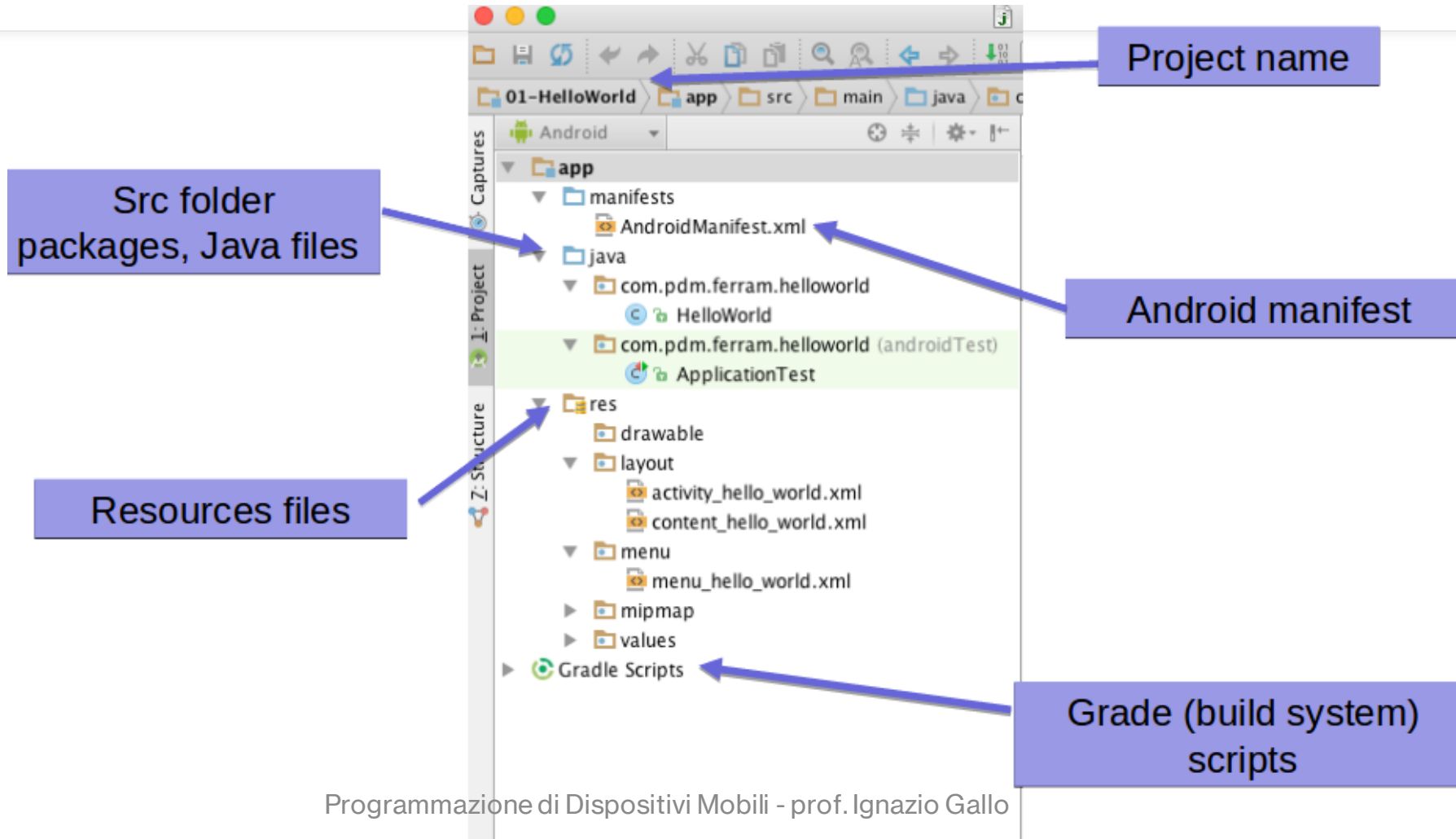
Your app will run on approximately 100% of devices

Help me choose

☐ This project will support instant apps

Previous Next Cancel Finish

Project contents



Gradle for Android



Viene eseguito su JVM

- The Android build system
 - compiles app resources and source code,
 - packages them into APKs that you can test,
 - deploy, sign, and distribute.
- Android Studio uses Gradle to automate and manage the build process
- Gradle is an open-source **build automation system**
 - builds upon the concepts of Apache **Ant** and Apache **Maven**
 - introduces a **Groovy**-based **domain-specific language** (DSL) instead of the XML form

```
apply plugin: 'java'
group = 'com.mycompany.app'
archiveBaseName = 'my-app'

repositories {
    mavenCentral()
}

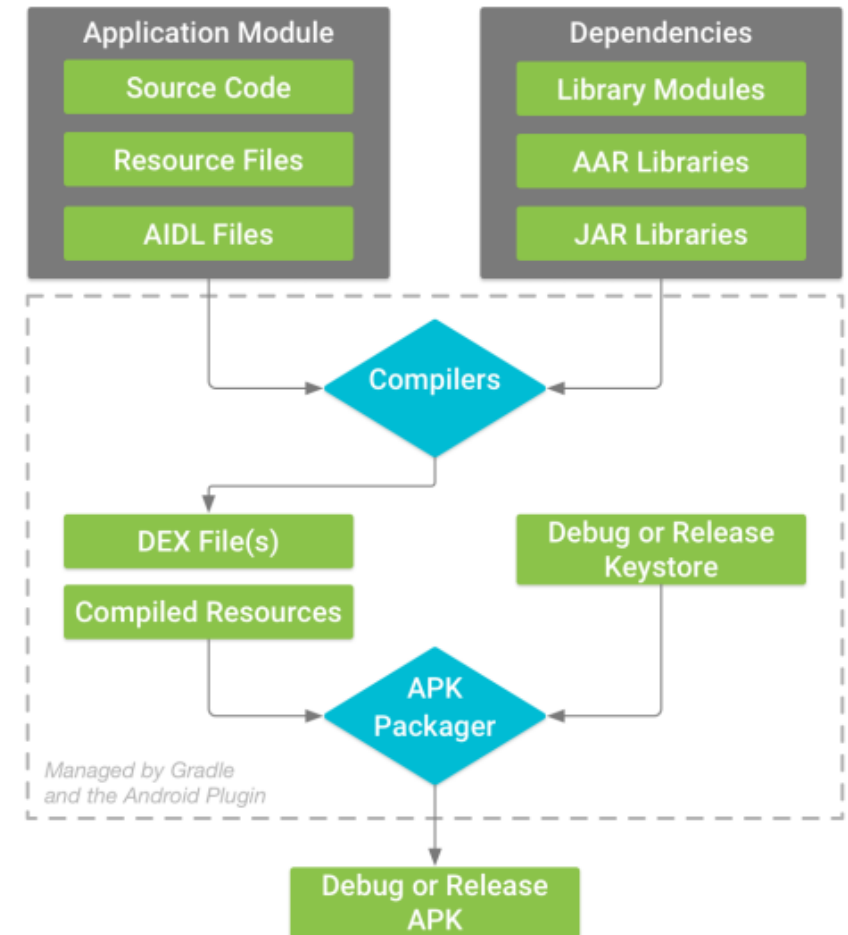
dependencies {
    testCompile 'junit:junit:4.11'
}
```

Groovy è un linguaggio orientato agli oggetti per la Java Virtual Machine (JVM)

esempi di DSL i linguaggi R e S per la statistica, e il linguaggio SQL per i database relazionali. Il suo opposto è un linguaggio generico (general-purpose language, GPL)

The Build Process

- The build process involves many tools and processes,
- that convert your project into an Android Application Package (APK).
- The compilers convert your source code into DEX (Dalvik Executable) files
- The APK Packager combines the DEX files and compiled resources into a single APK
- The APK Packager signs your APK



The build process of a typical Android app module.

APK package

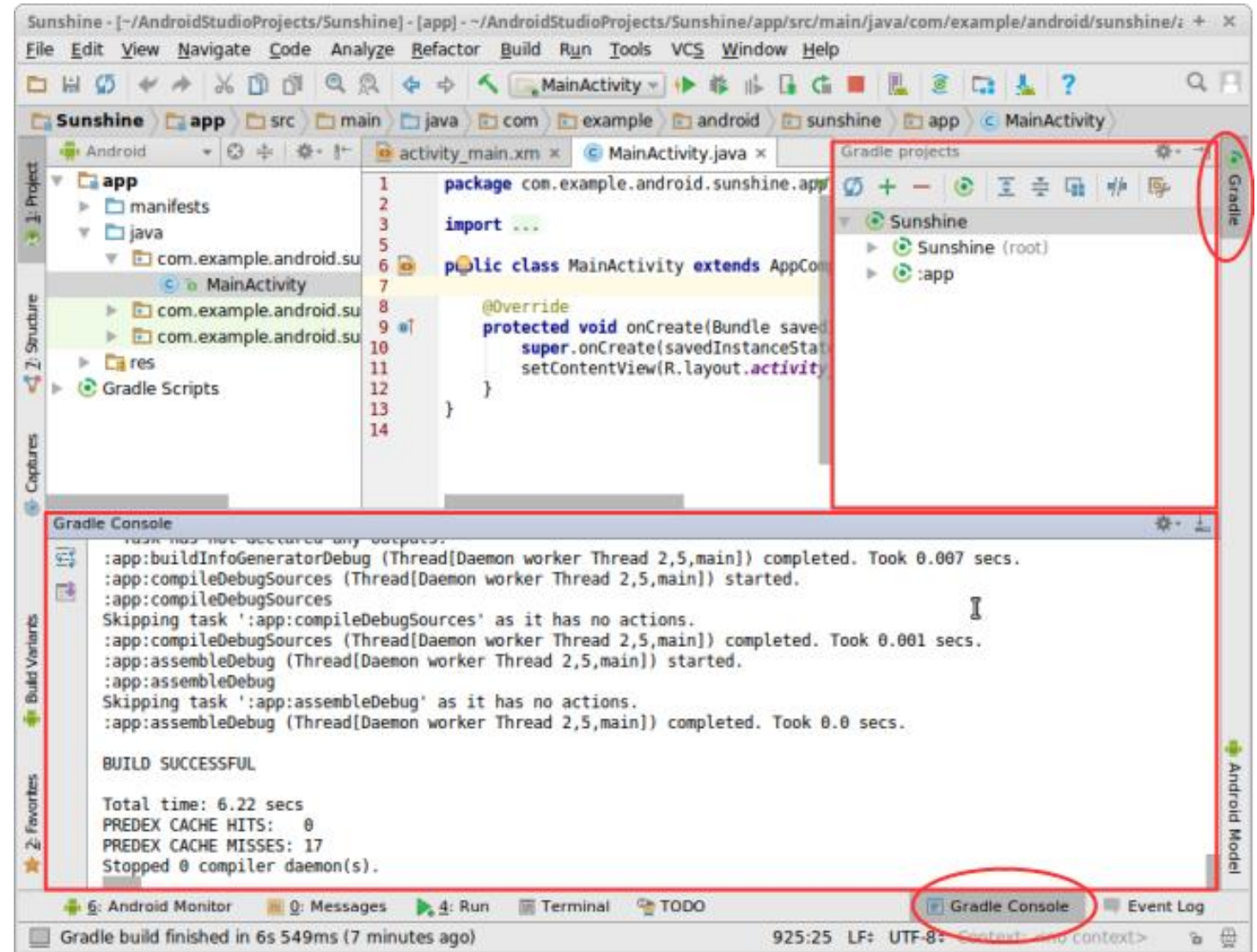


- From a file perspective, an Android app is a single zip archive file with the suffix .apk.
- It contains your complete app including all meta-information, which is necessary to run the app on an Android device.
- The most important control artifact inside is the file **AndroidManifest.xml** describing the application and the components an application consists of.

Gradle console and Gradle Task Window

Details about the build process:

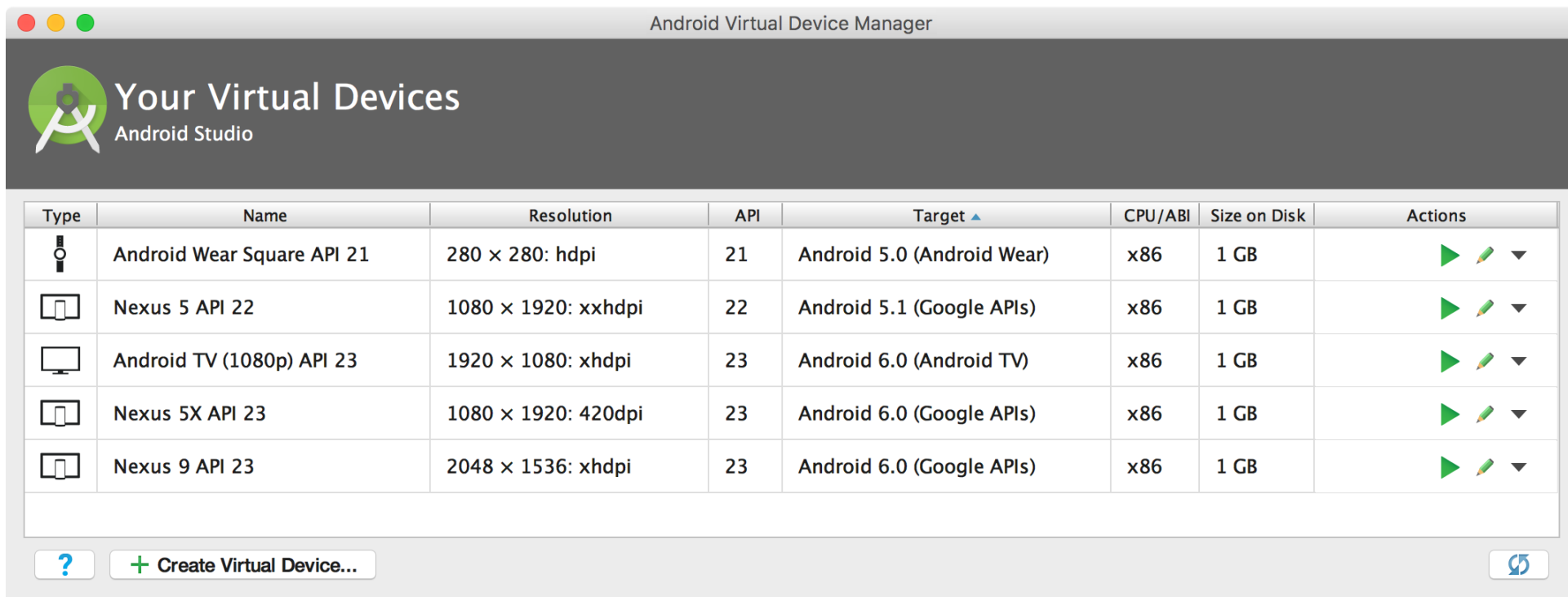
- Tools > Gradle Console
- The console displays each task that Gradle executes in order to build your app
- To view the list of all available build tasks, click View > Tool Windows > Gradle



Create an Android Virtual Device (AVD)

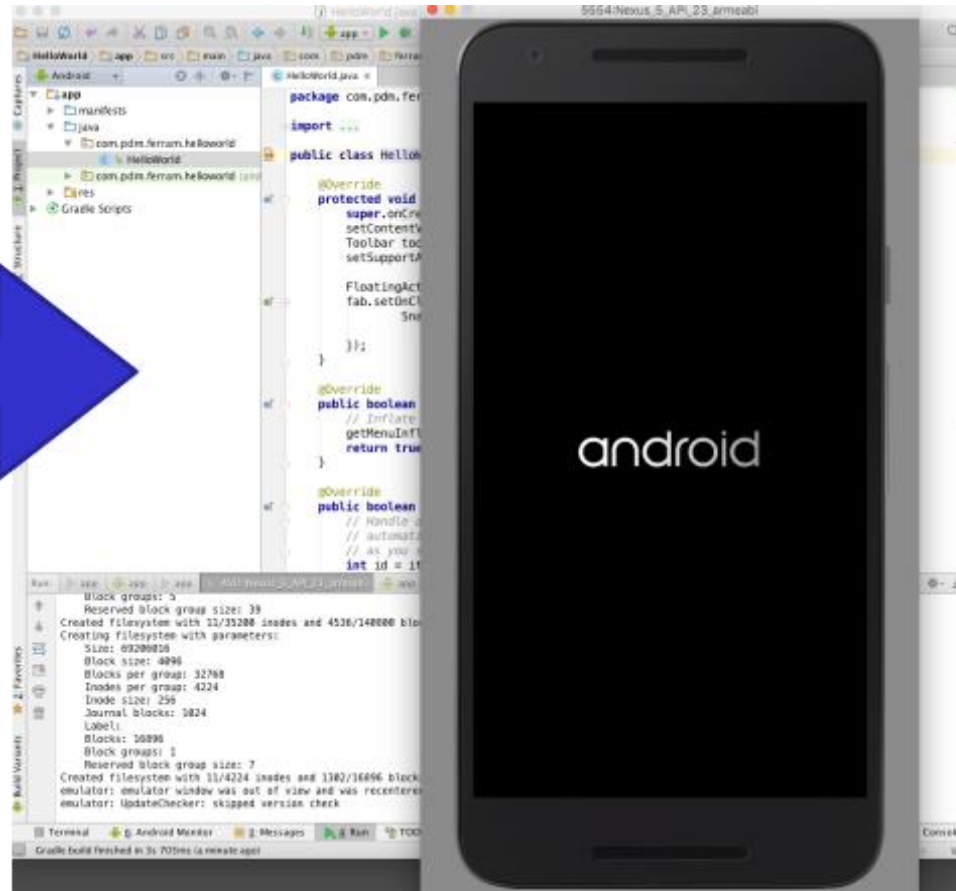
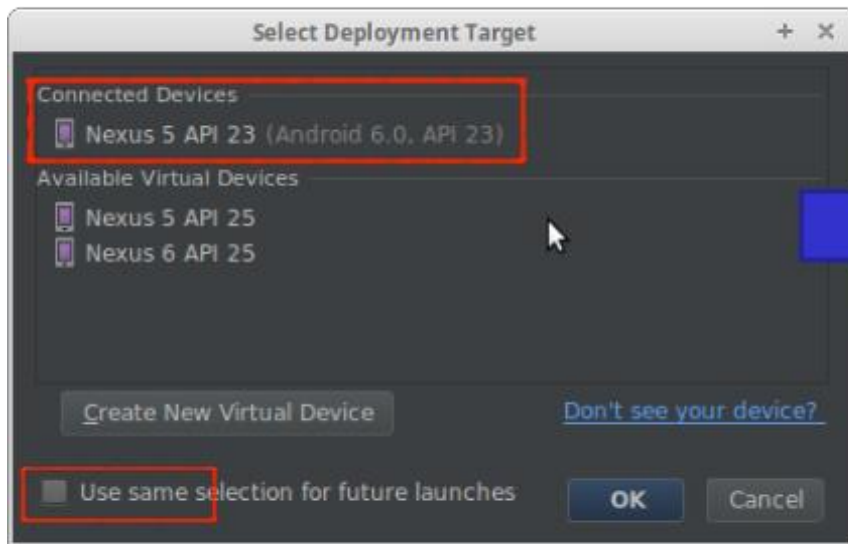
- An AVD contains a hardware profile, system image, storage area, skin, and other properties.
- An Android Virtual Device (AVD) definition lets you define the characteristics of an Android phone, tablet, Android Wear, or Android TV device that you want to simulate in the Android Emulator.

Select: Tools > AVD Manager



Run the app from Android Studio

Select: Run > Run 'app'



wait...



Run the app from command-line

```
~/Android/Sdk/emulator/emulator -avd Nexus4-API-22
```

```
cd <project-dir>
```

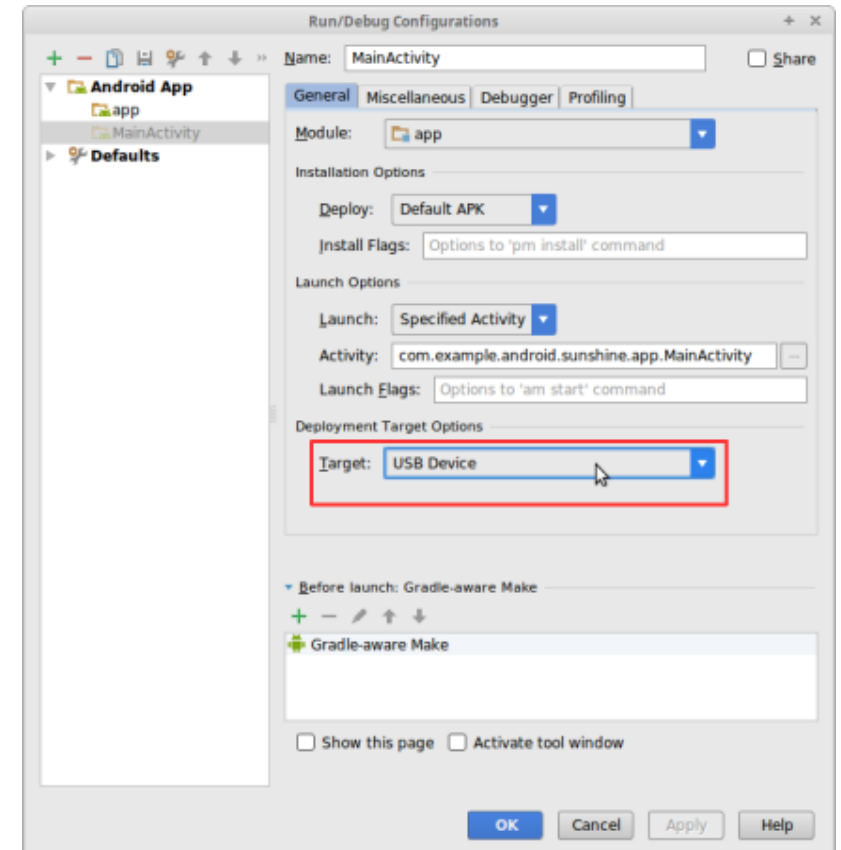
```
gradlew tasks --all  
gradlew installDebug
```

```
~/Android/Sdk/platform-tools/adb shell am start -n  
com.example.myapplication/.MainActivity
```



Setting up a Device for Development

- Enable **USB debugging** on your device by going to **Settings > Developer options**.
- Set up your system to detect your device.
 - For Windows, Mac OS X or Ubuntu Linux go to the following page:
<https://developer.android.com/studio/run/device.html#setting-up>
 - Click on **Run > Edit configuration...**
 - Select the USB Device as Target





Key points

- Android Studio IDE
- Android SDK
- Creare la prima App
- Introduzione a Gradle
- APK