OpenLab session 8. 4. 2016

Android development

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CRCS

Centre for Research on
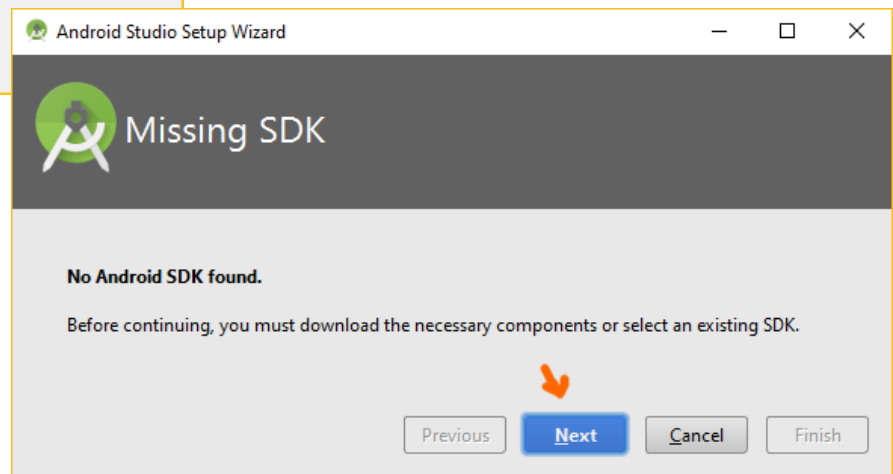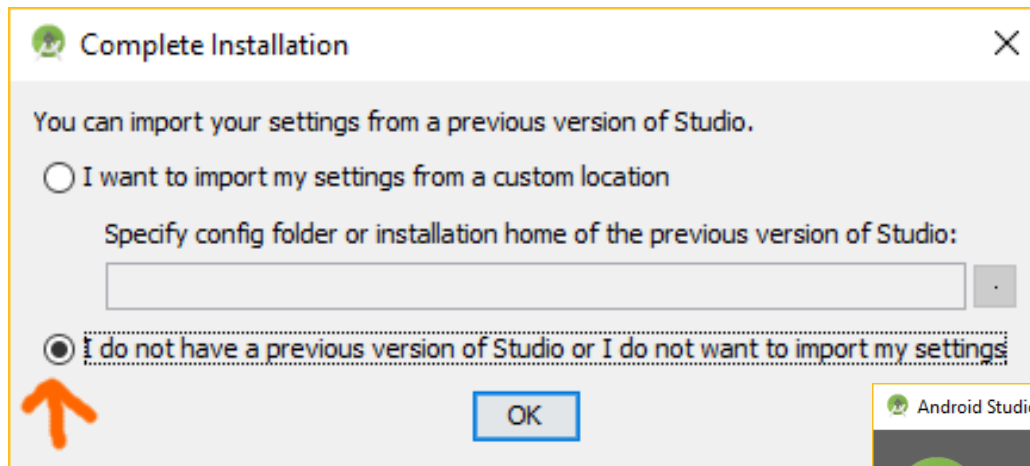Cryptography and Security

Outline

- Android Studio installation
- Android fundamentals
- Creating an Android project
- Running your application
- Building a simple user interface
- Starting another activity

Android Studio installation

- Download & install
- https://developer.android.com/sdk/index.html

- On lab computer
- https://dl.google.com/dl/android/studio/ide-zips/2.0.0.20/android-studio-ide-143.2739321-windows.zip
- Use 7-Zip to extract to e.g. D:\Android

Installation

- Run D:\Android\android-studio\bin\studio64.exe

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- Install the SDK to same path as your Android Studio for easier cleanup
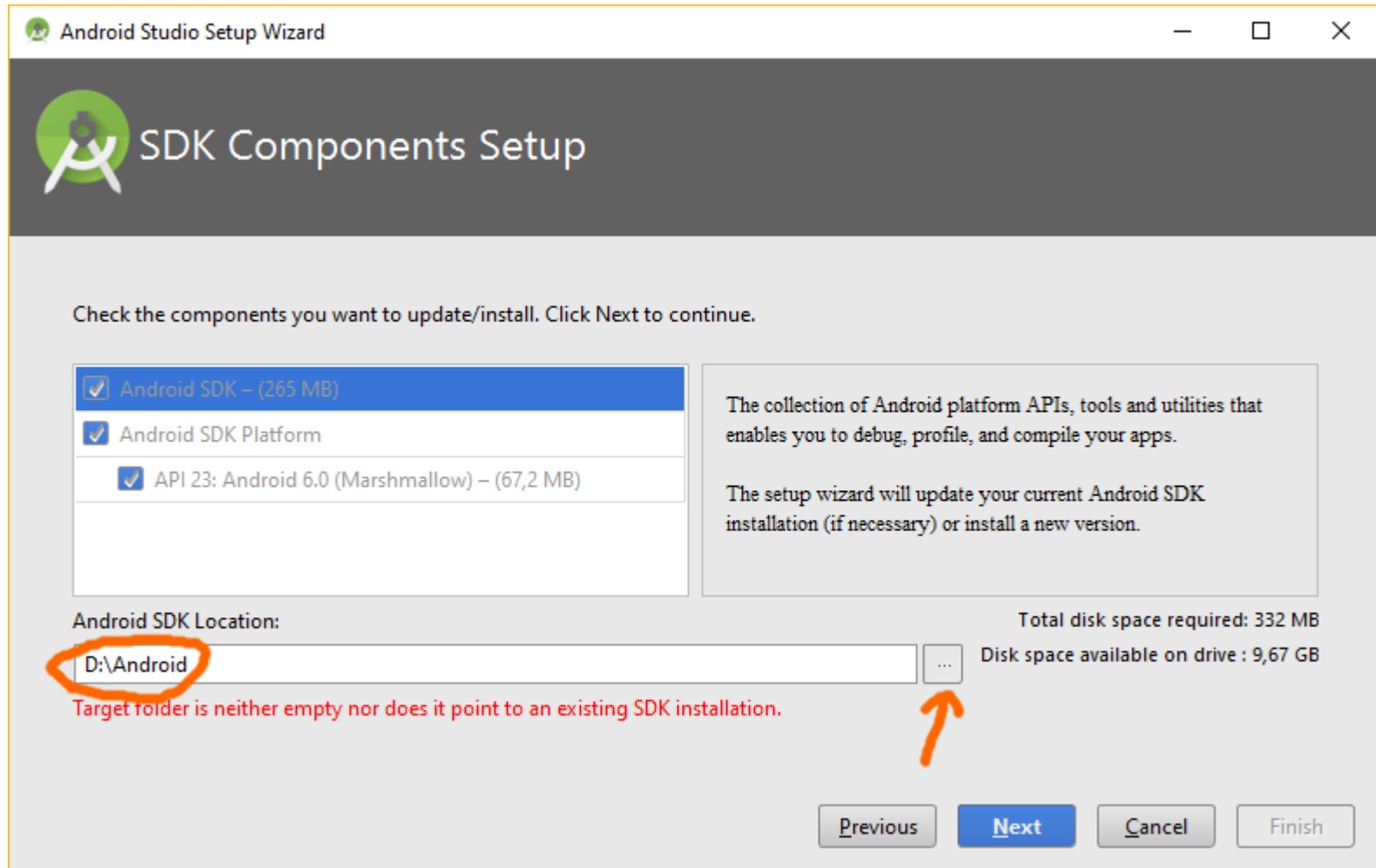
App components

- **Activity** - single screen with a user interface
- **Service** - runs in the background to perform long-running operations; no user interface
- **Content provider** - manages a shared set of app data (file system, SQLite DB, web)
- **Broadcast receiver** - responds to system-wide broadcast announcements (intents)
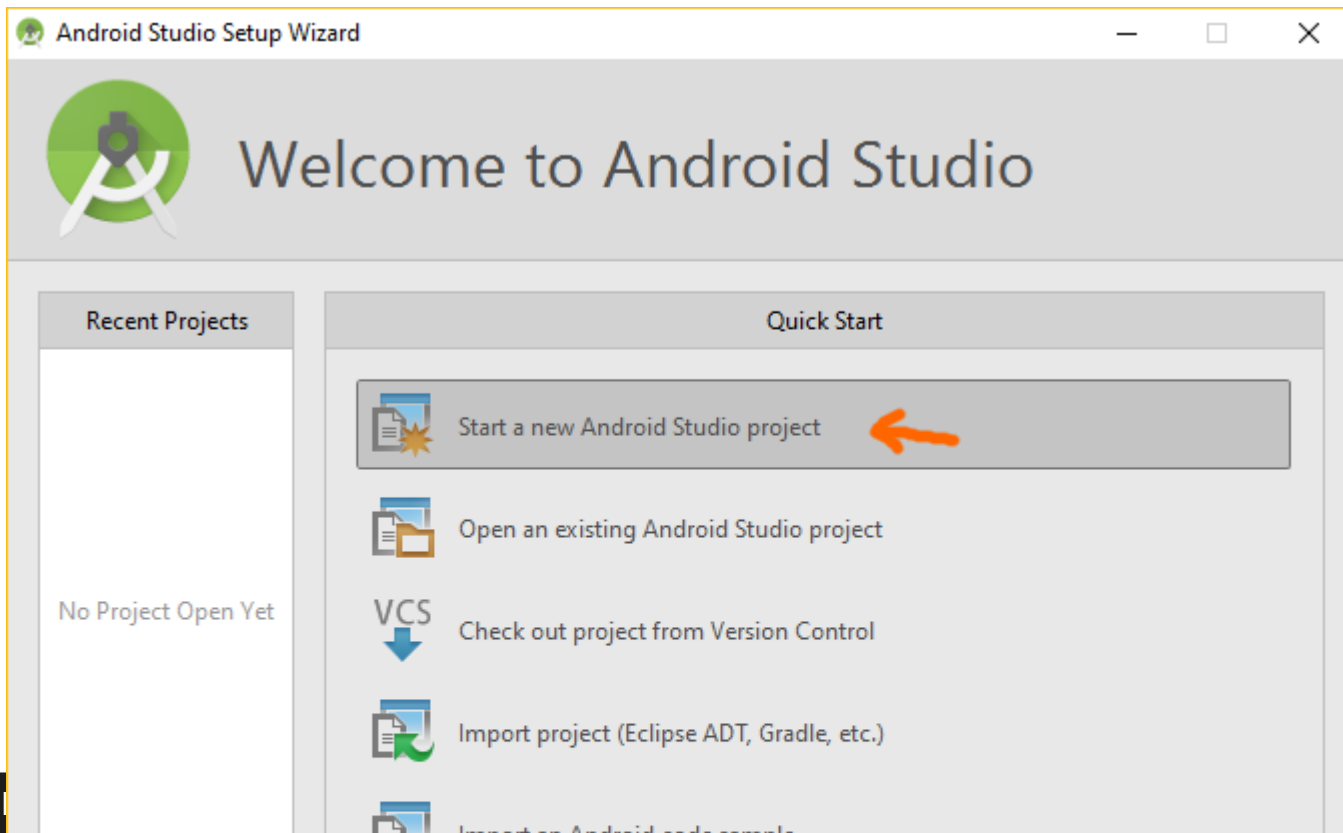
The Manifest file

- Declaring components
  - <activity> <service> <receiver> <provider>
- Declaring component capabilities
  - <intent-filter>
- Declaring app requirements
  - <uses-sdk android:minSdkVersion="7" android:targetSdkVersion="19" />
  - <uses-feature android:name="android.hardware.camera.any" android:required="true" />
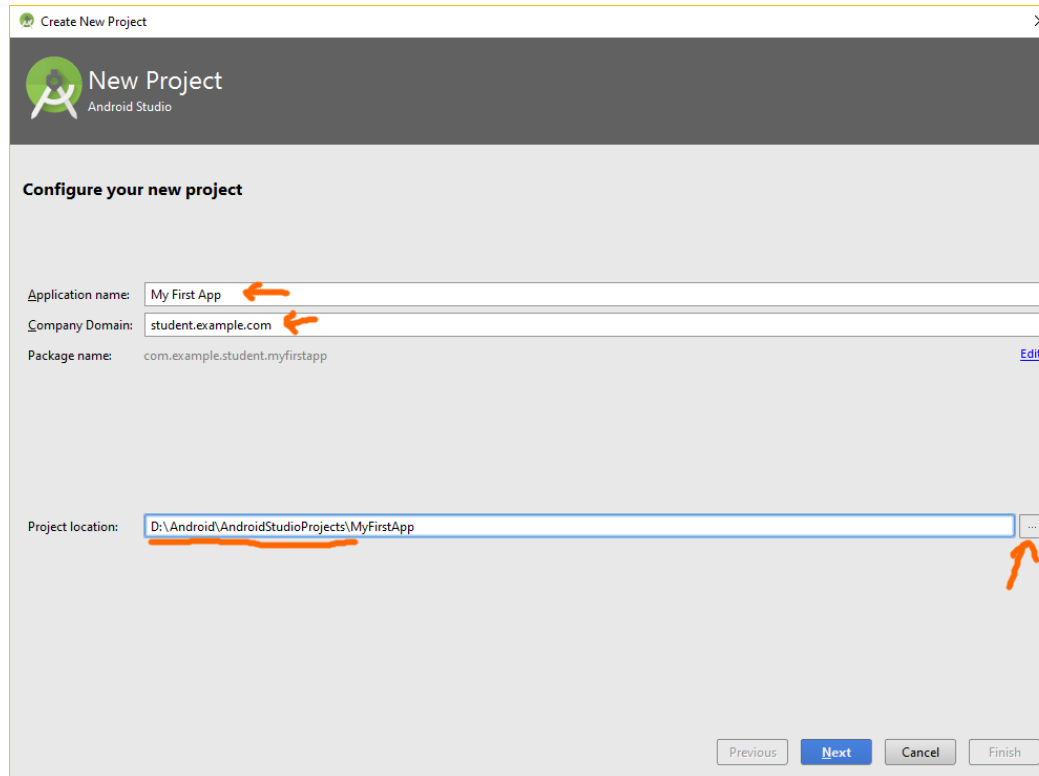
App resources

- Images
- Layouts
  - For different screen sizes and orientations
- Strings
  - For localization
- Colors
- …

Building your first app

- Tutorial based on
  developer.android.com/training/basics/firstapp/

New project (My First App)

- **Create the project at the same location as IDE**

Minimum SDK & Target SDK

- https://developer.android.com/about/dashboards/

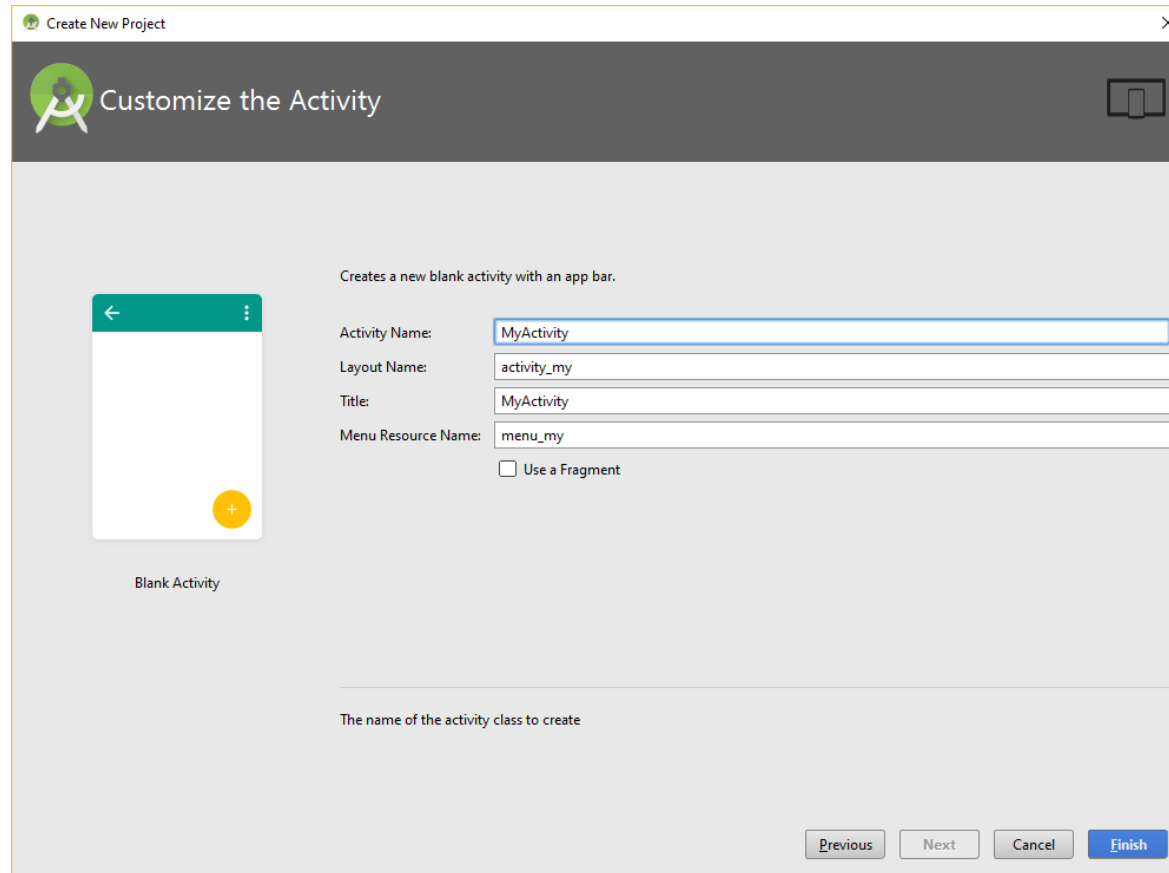| Version	Codename	API	Distribution
2.2	Froyo	8	0.1%
2.3.3 - 2.3.7	Gingerbread	10	2.6%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	2.2%
4.1.x	Jelly Bean	16	7.8%
4.2.x		17	10.5%
4.3		18	3.0%
4.4	KitKat	19	33.4%
5.0	Lollipop	21	16.4%
5.1		22	19.4%
6.0	Marshmallow	23	4.6%
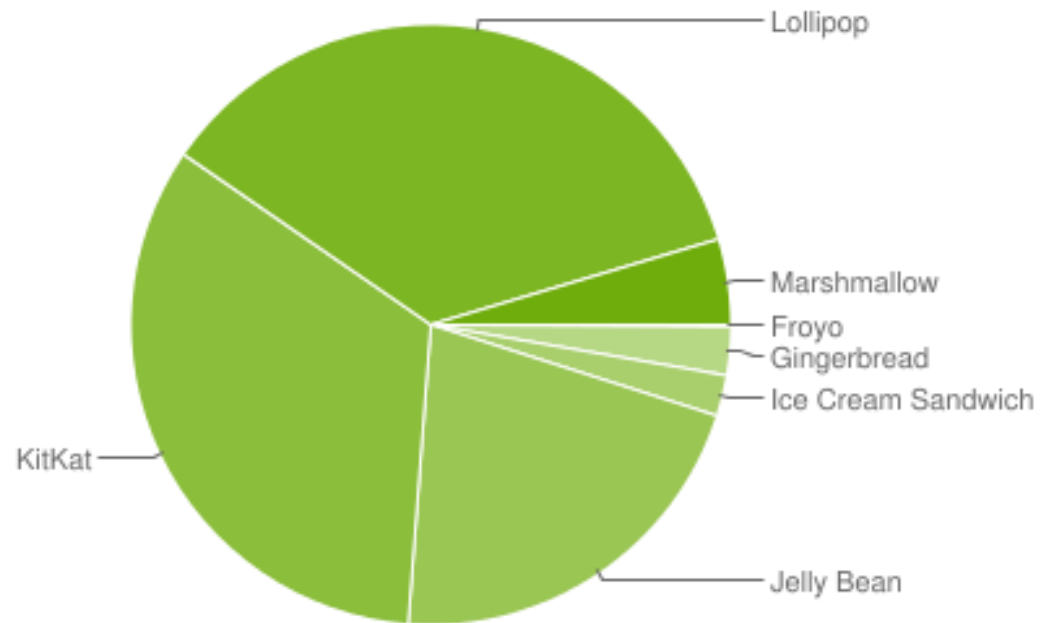
Data collected during a 7-day period ending on April 4, 2016.

Add an activity
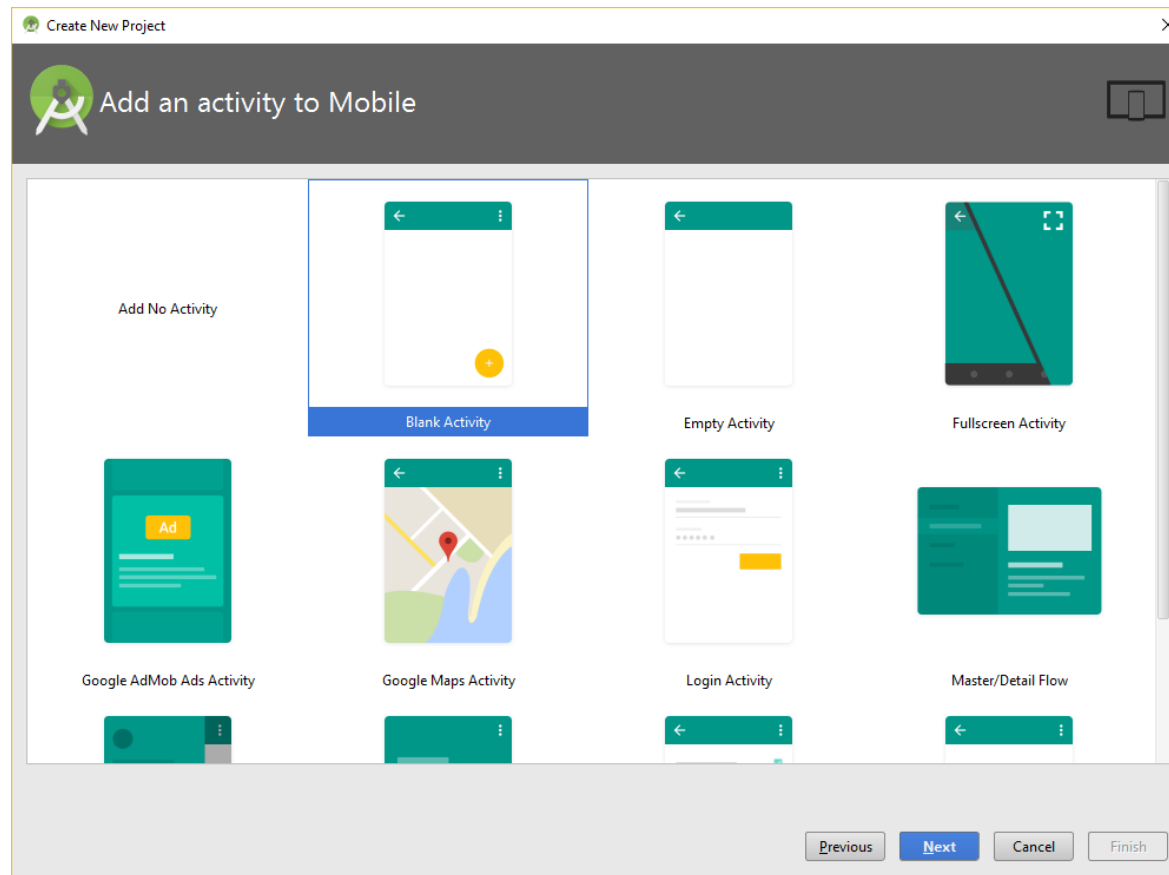
Customize the Activity (MyActivity)

Project files
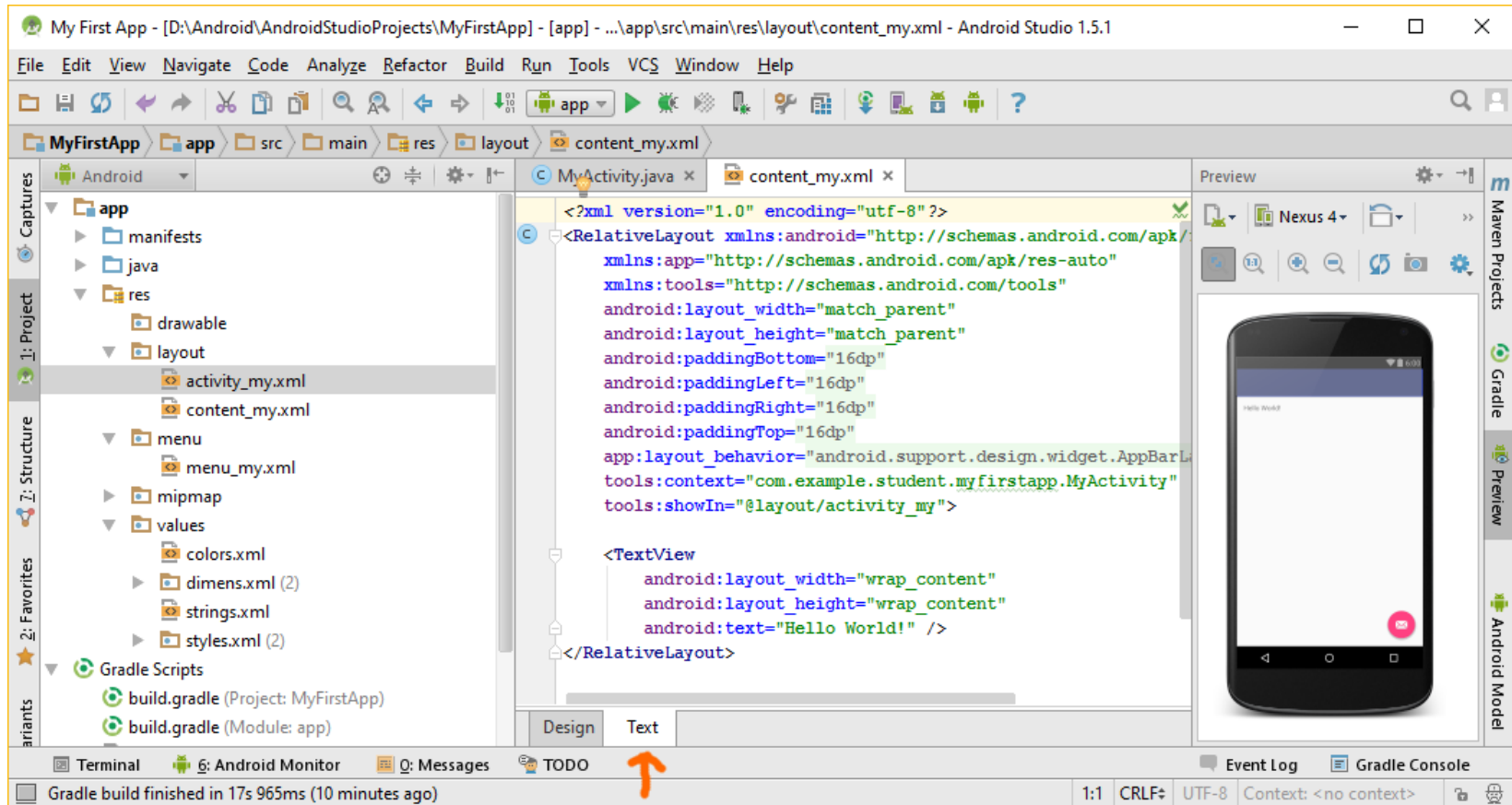
Run the app – real device

- Android 3.2 or older
  - **Settings > Applications > Development**.
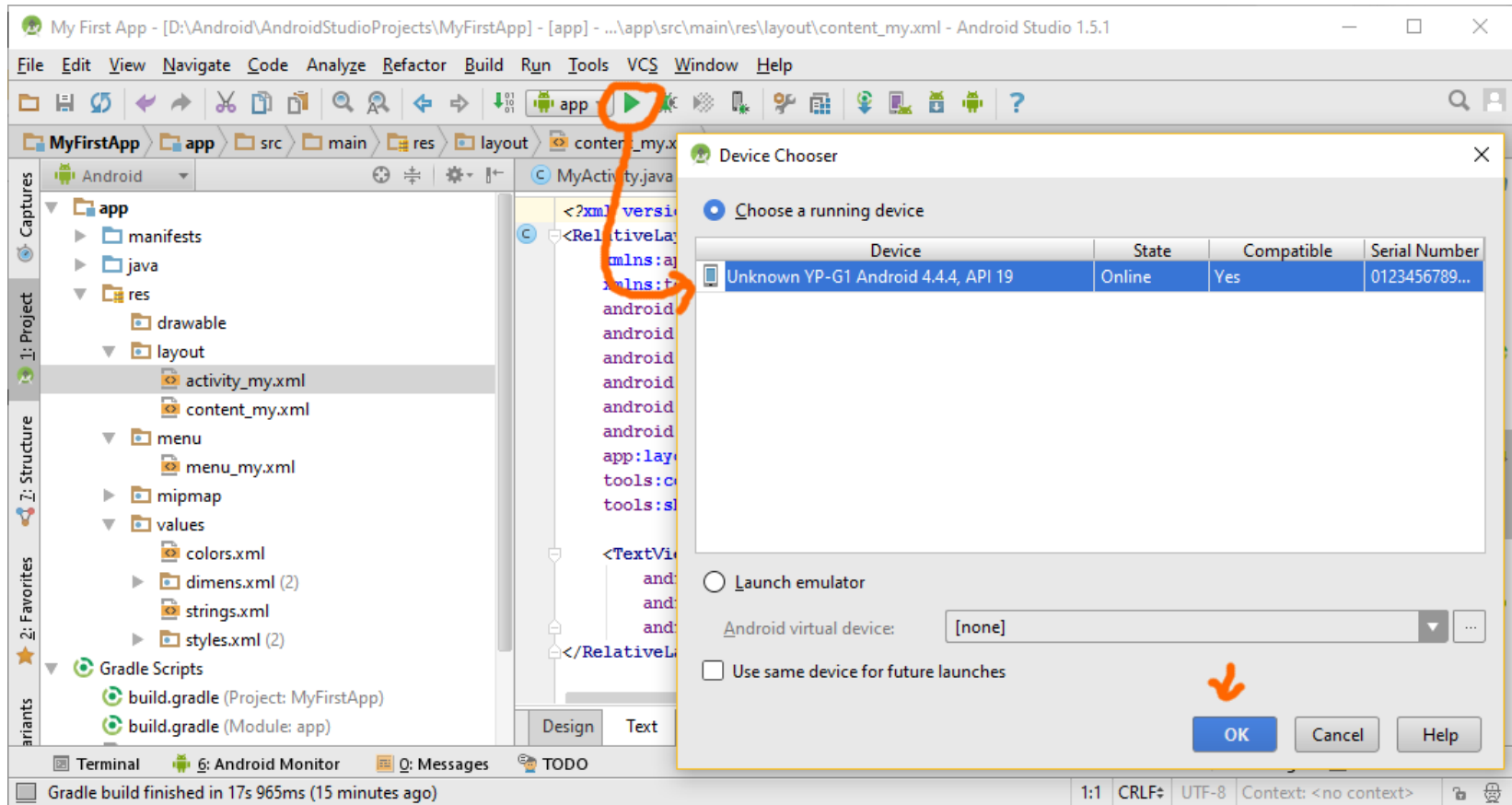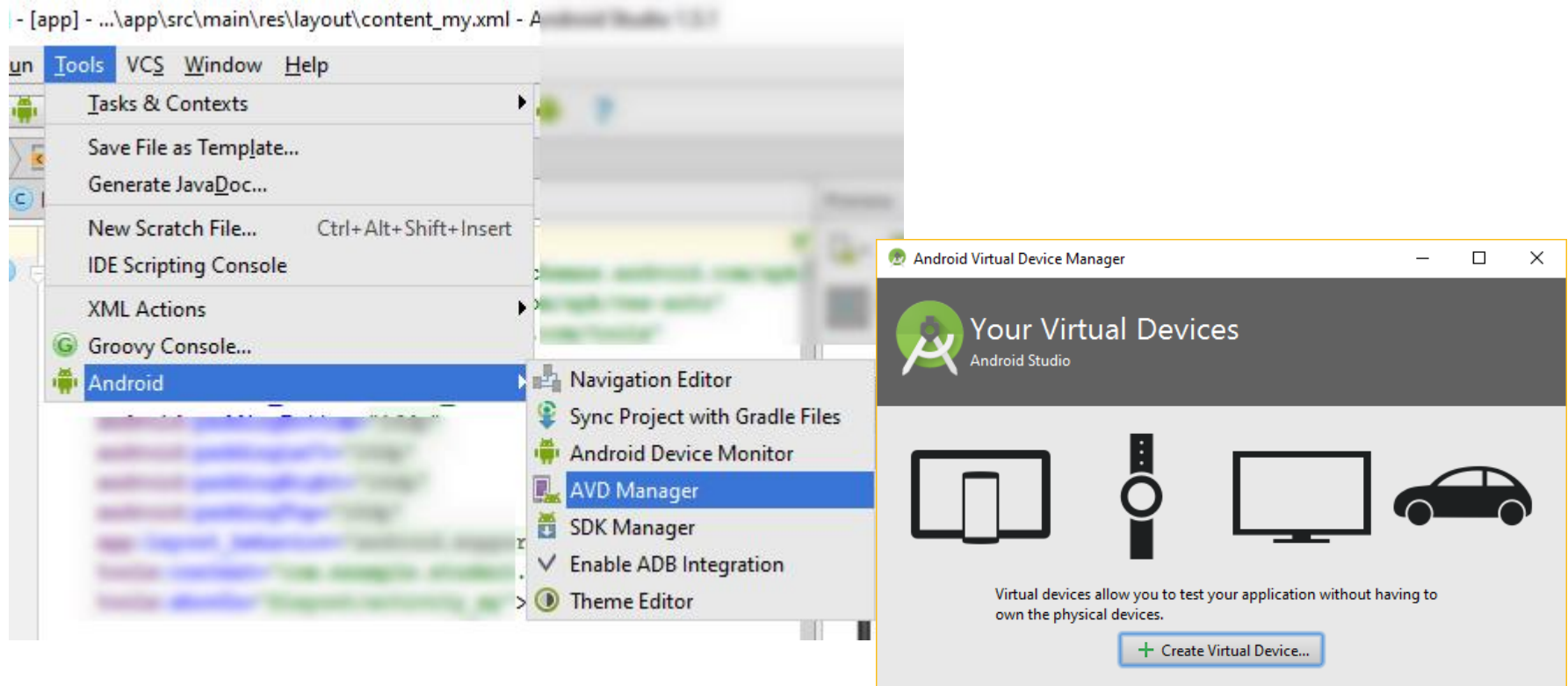- Android 4.0 and newer
  - **Settings > Developer options**
- **Note:** On Android 4.2 and newer, **Developer options** is hidden by default. To make it available, go to **Settings > About phone** and tap **Build number** seven times. Return to the previous screen to find **Developer options**.

Run the app – real device

Run on the Emulator

- **Select any device**
- **Install SDK 23 ARM (no Google APIs)**

Continue the tutorial

- Building a Simple User Interface
  - https://developer.android.com/training/basics/firstapp/building-ui.html

- Starting Another Activity
  - https://developer.android.com/training/basics/firstapp/starting-activity.html

More guides

- Practical guides
  - https://developer.android.com/training/
- Fundamentals
  - https://developer.android.com/guide/
- API reference
  - https://developer.android.com/reference/packages.html

Cleanup

- If you are working on a lab computer, please delete Android Studio, Android SDK and your project