Android Programming

Materi

- Pengenalan Android
- Android Structure Directory
- Android Activity - Intent
- Android Layout - Template
- Android ListView
- Android Component & Event Handler
- Android Model Data Adapter
- Android SQLite
- Android SQLite - CRUD
- Android Web Service : READ DATA
- Studi Kasus

Pengenalan Android

Backround Android   ?

✓ Sebuah sistem operasi (OS) untuk perangkat mobile seperti smartphone dan komputer tablet, kini dikembangkan oleh Google.

✓ Juli 2005, Google membeli (akuisisi) perusahaan Android Corp
✓ November 2007, aliansi perusahaan2 bernama **Open Handset Alliance** yang dipimpim oleh **Google**
✓ Oktober 2008, android tersedia dalam platform Open Source
✓ Desember 2008, 14 member baru bergabung ke project android
✓ April 30, 2009 : rilis Android 1.5 inisial name : **C**upcake1.
✓ Sept 15, 2009 : rilis Android 1.6 inisial name : **D**onut

Android Version

Version	Codename	API	Distribution
2.3.3 - 2.3.7	Gingerbread	10	1.0%
4.0.3 - 4.0.4	Ice Cream Sandwich	15	1.1%
4.1.x	Jelly Bean	16	4.0%
4.2.x		17	5.9%
4.3		18	1.7%
4.4	KitKat	19	22.6%
5.0	Lollipop	21	10.1%
5.1		22	23.3%
6.0	Marshmallow	23	29.6%
7.0	Nougat	24	0.5%
7.1		25	0.2%
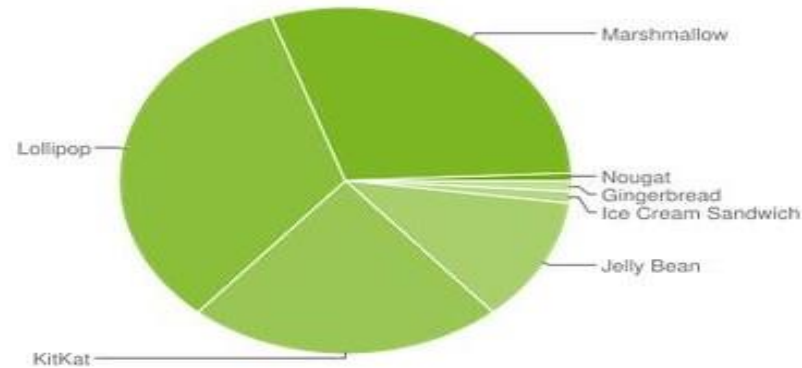
Data collected during a 7-day period ending on January 9, 2017.

https://developer.android.com/about/dashboards/index.html

Android Name

Apple Pie 1.0 · Cupcake 1.5 · Donut 1.6 · Eclair 2.0/ 2.1 · Froyo 2.2 · Gingerbread 2.3.x · Honeycomb 3.x

Ice Cream Sandwich 4.0.x · Jelly Bean 4.1/4.2/4.3 · KitKat 4.4 · Lollipop 5.0 · Marshmallow 6.0 · Nougat 7.0 · Oreo 8.0 · Pie 9.0
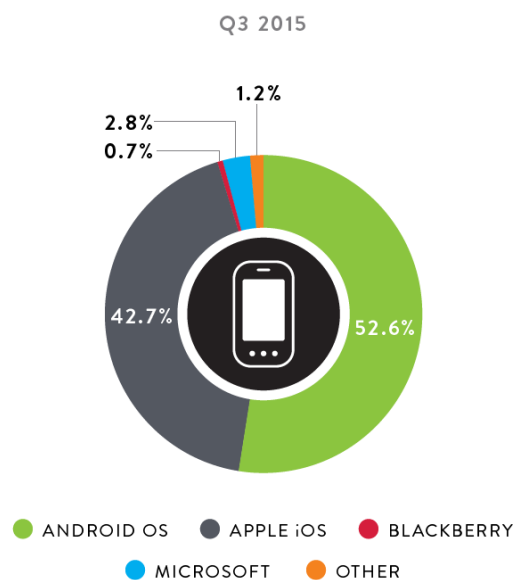
Android Market Share


TOP U.S. SMARTPHONE OPERATING SYSTEMS
BY MARKET SHARE

Q3 2015

1.2%
2.8%
0.7%

42.7%   52.6%

● ANDROID OS   ● APPLE iOS   ● BLACKBERRY
● MICROSOFT   ● OTHER

Read As: During Q3 2015, 52.6% of U.S. smartphone owners used a handset that runs on the Android operating system.
Source: Nielsen

Copyright © 2015 The Nielsen Company

Tech 📊 Chart of the Day

Smartphone Platform Market Share

Worldwide smartphone operating system market share (% of new device shipments)*

■ 2015   ■ 2019

81.2% 82.6%

15.8% 14.1%

2.2% 2.3%   0.8% 0.9%

🤖   iOS   ⊞ Windows Phone   Others
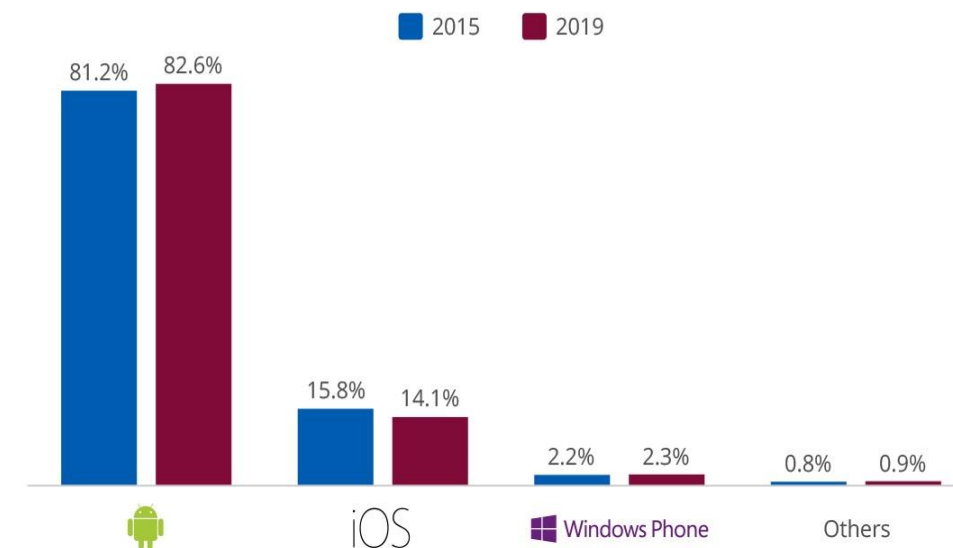
* Forecast

BUSINESS INSIDER   Source: IDC   ©①=   statista

Ekosistem Android

- ✓ Platform Open Source untuk perangkat mobile, system embedded dan perangkat pakai lainnya
- ✓ Google bertanggung jawab memaintenance system
- ✓ Perusahaan lain berkontribusi ke system
- ✓ Setiap device (vendor) dapat mengembangkan system android sesuai dengan kebutuhan masing2

Arsitektur Android
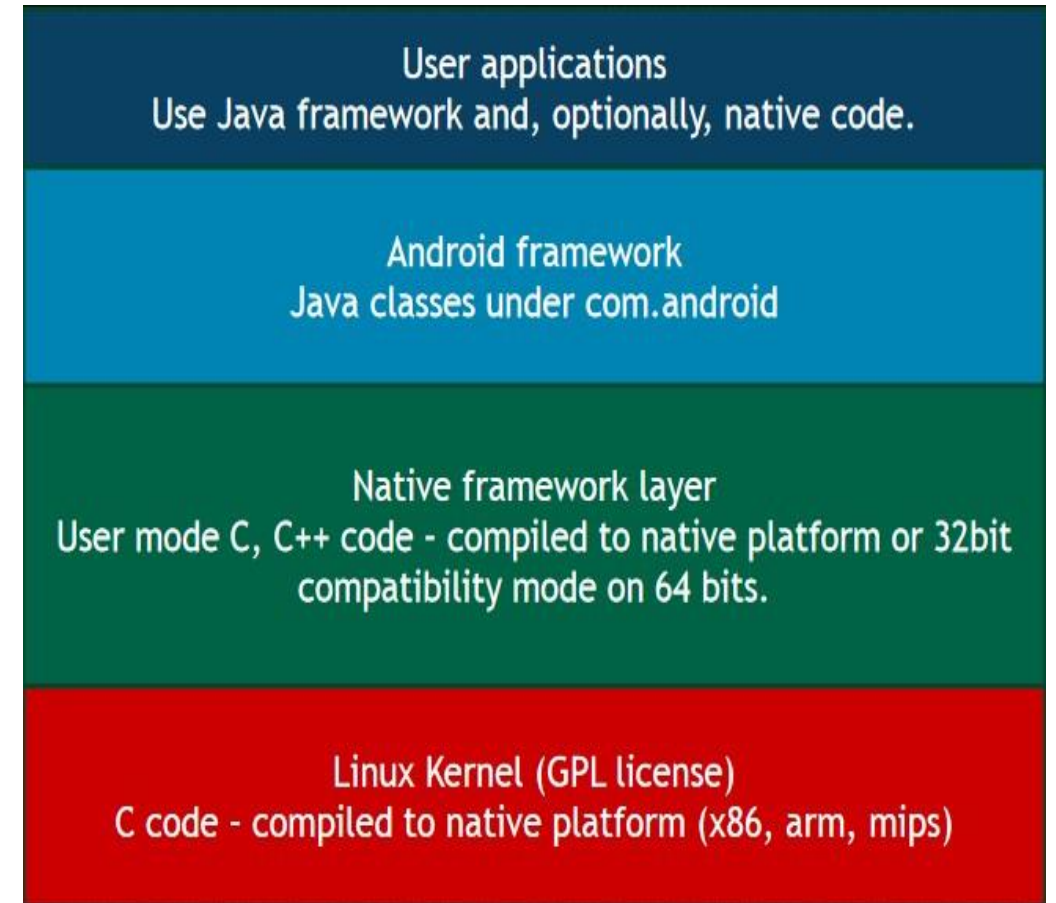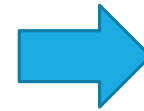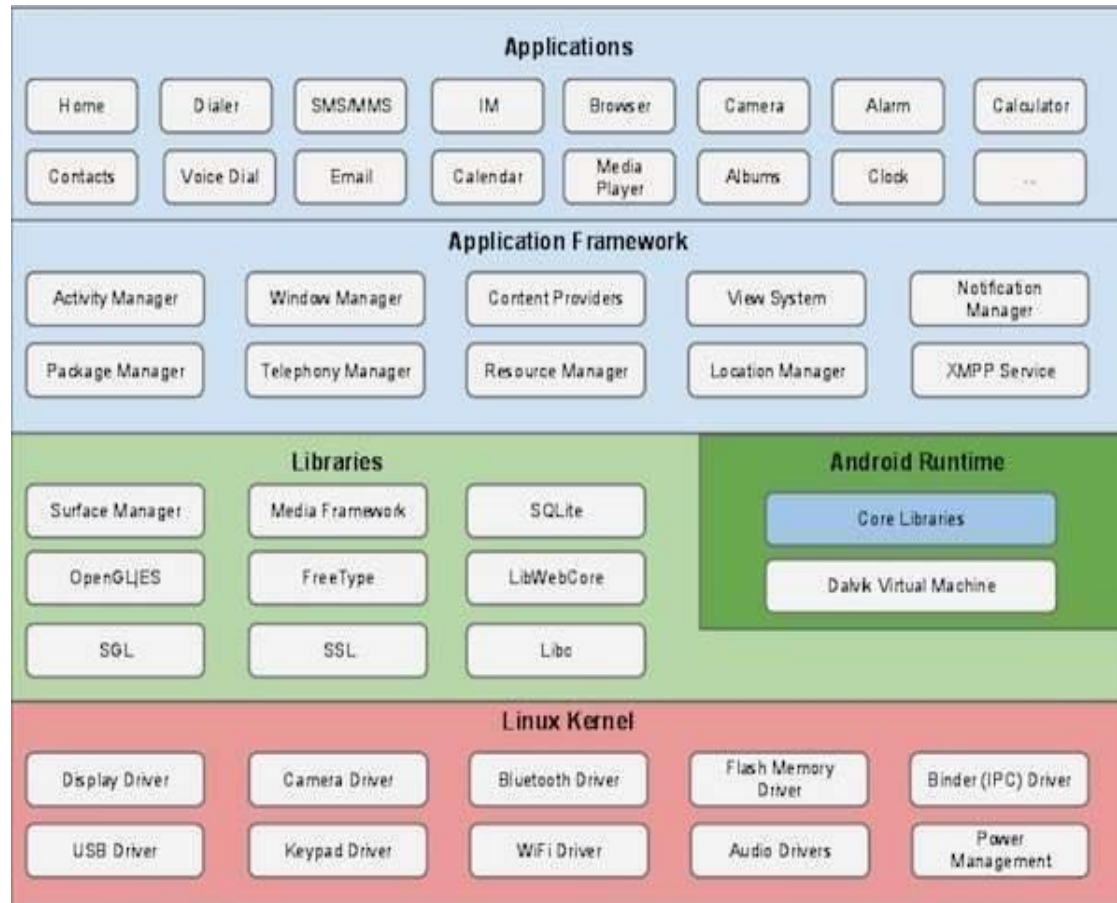
Mobile App Development

✓ Proses pengembangan aplikasi piranti lunak (software) untuk perangkat mobile

Strategi pengembangan aplikasi mobile

✓ Native App

Pengembangan aplikasi mobile yang spesifik untuk system operasi / platform tertentu. Dikembangkan menggunakan SDK native code sesuai platform.

✓ Web App

Pengembangan aplikasi mobile menggunakan standard teknologi web: HTML5, JavaScript & CSS

✓ Hybrid App

Pengembangan aplikasi mobile menggunakan standard web yang merupakan wrapper ke native shell platform mobile. Wrapper member akses ke fitur2 pada platform mobile : GPS, Camera, Native Look and Feel dan lain-lain.

Strategi pengembangan aplikasi mobile

Native Application

Apps developed using Native SDK

Hybrid Application

Apps developed using HTML5, CSS, JavaScript and native shell

Web Application

Apps developed using Web Technologies

− **Cross Platform Capability** +
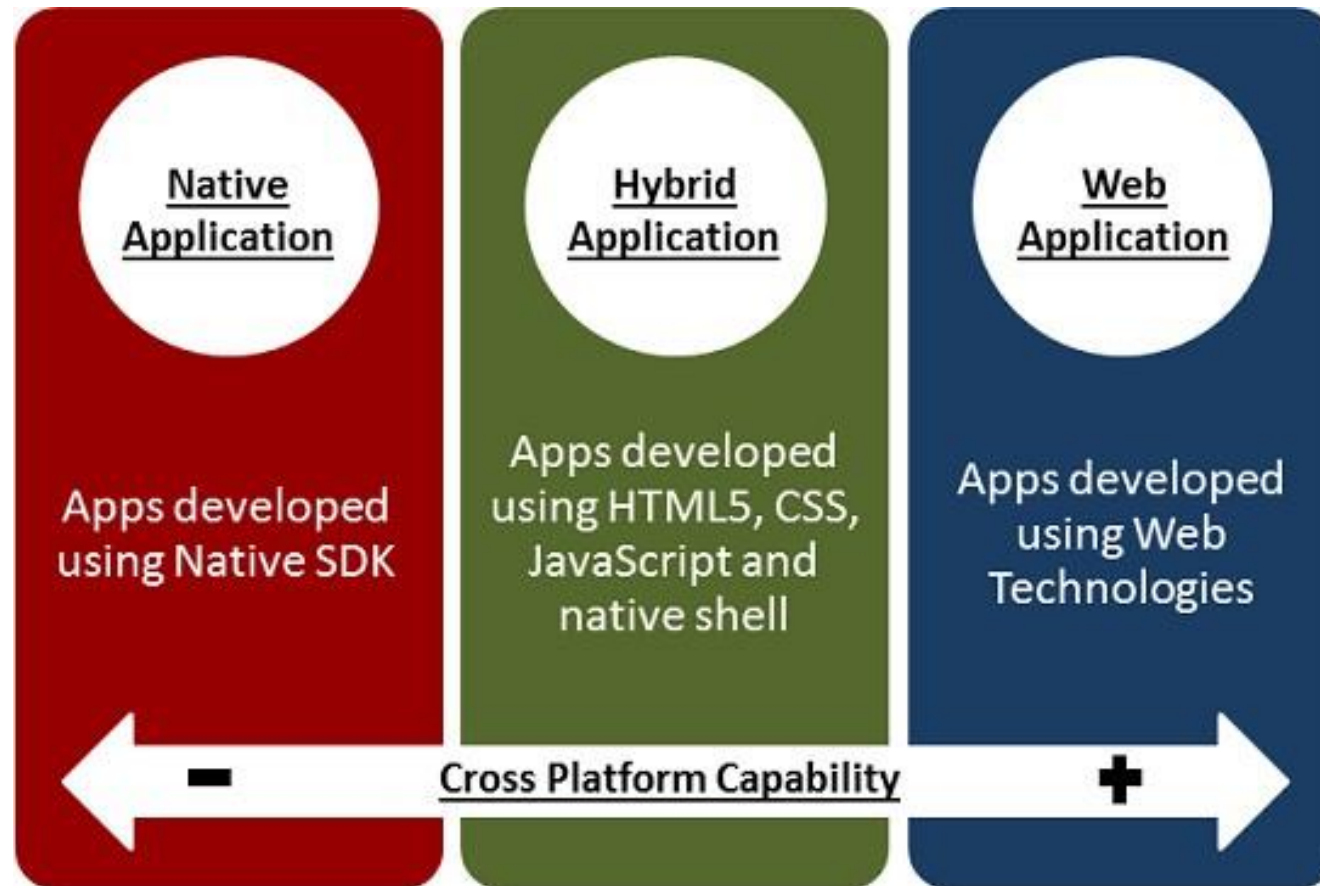
Strategi pengembangan aplikasi mobile

Android Developer

- Developer site : https://developer.android.com/index.html

- Android studio : https://developer.android.com/studio/index.html

- Source :
  - https://android.googlesource.com/
  - https://source.android.com/devices/index.html

- Tutorial :
  - https://developer.android.com/training/index.html
  - https://guides.codepath.com/android/
  - https://www.tutorialspoint.com/android/
  - http://www.vogella.com/tutorials/android.html

Minimum Requirement Development

Windows

- Microsoft® Windows® 8/7/Vista/2003 (32 or 64-bit)

- 2 GB RAM minimum, 4 GB RAM recommended

- 400 MB hard disk space + at least 1 G for Android SDK, emulator system images, and caches

- 1280 x 800 minimum screen resolution

- Java Development Kit (JDK) 7

- Optional for accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality

https://www.quora.com/What-are-the-recommended-hardware-for-Android-Studio

Minimum Requirement Development

Mac OS X

- Mac® OS X® 10.8.5 or higher, up to 10.9 (Mavericks)

- 2 GB RAM minimum, 4 GB RAM recommended

- 400 MB hard disk space

- At least 1 GB for Android SDK, emulator system images, and caches

- 1280 x 800 minimum screen resolution

- Java Runtime Environment (JRE) 6

- Java Development Kit (JDK) 7

- Optional for accelerated emulator: Intel® processor with support for Intel® VT-x, Intel® EM64T (Intel® 64), and Execute Disable (XD) Bit functionality

https://www.quora.com/What-are-the-recommended-hardware-for-Android-Studio

Minimum Requirement Development

Linux

- GNOME or KDE desktop
- GNU C Library (glibc) 2.11 or later
- 2 GB RAM minimum, 4 GB RAM recommended
- 400 MB hard disk space
- At least 1 GB for Android SDK, emulator system images, and caches
- 1280 x 800 minimum screen resolution
- Oracle® Java Development Kit (JDK) 7

https://www.quora.com/What-are-the-recommended-hardware-for-Android-Studio

Tools Development

✓ Java Development Kit (JDK)

✓ Android Standard Development Kit (SDK)

✓ IDE : Android Studio

✓ Emulator

   ✓ Android Virtual Device (AVD)

   ✓ Genymotion

   ✓ Your smartphone

Java Development Kit (JDK)
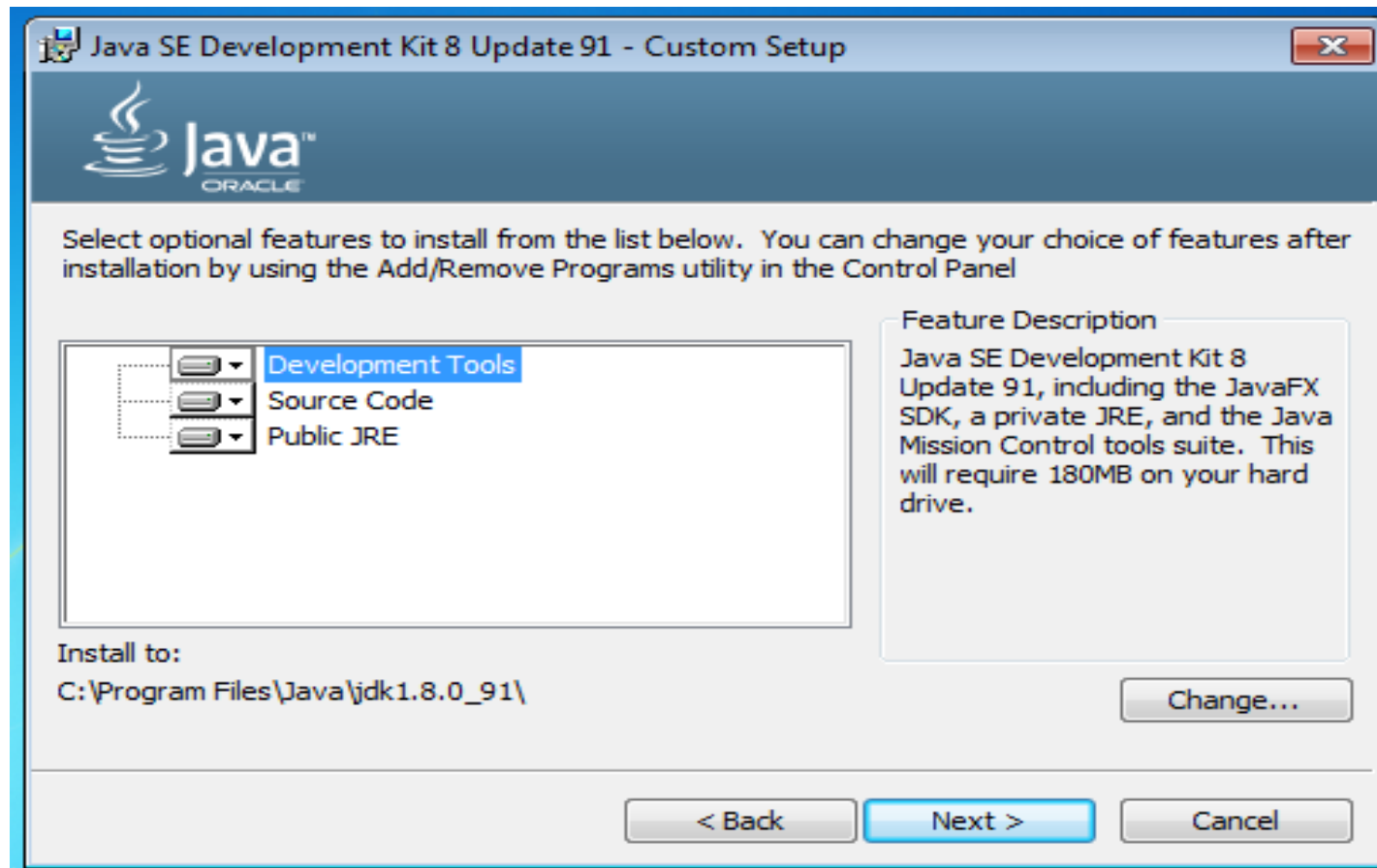
Android SDK

Android SDK

SDK Tools

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: F:\android   Edit

| SDK Platforms | SDK Tools | SDK Update Sites |

Below are the available SDK developer tools. Once installed, Android Studio will automatically check for updates.
Check "show package details" to display available versions of an SDK Tool.

Name	Version	Status
☐ Android SDK Build-Tools		Update Available: 25.0.2
☐ CMake		Not Installed
☐ LLDB		Not Installed
☐ Android Auto API Simulators	1	Not installed
☐ Android Auto Desktop Head Unit emulator	1.1	Not installed
☑ Android SDK Platform-Tools 25.0.3	25.0.3	Installed
☑ Android SDK Tools 25.2.5	25.2.5	Installed
☑ Android Support Library, rev 23.2.1	23.2.1	Installed
☑ Documentation for Android SDK	1	Installed
☐ GPU Debugging tools	1.0.3	Not installed
☐ GPU Debugging tools	3.1.0	Not installed
☐ Google Play APK Expansion library	1	Not installed
☐ Google Play Billing Library	5	Not installed
☐ Google Play Licensing Library	1	Not installed
☑ Google Play services	38	Installed
☑ Google USB Driver, rev 11	11.0.0	Installed
☐ Google Web Driver	2	Not installed
☑ Intel x86 Emulator Accelerator (HAXM installer)	6.0.5	Installed
☐ NDK	13.1.3345770	Not installed
▼ ☐ **Support Repository**		
☐ ConstraintLayout for Android		Update Available: 1
☐ Solver for ConstraintLayout		Update Available: 1

☐ Show Package Details

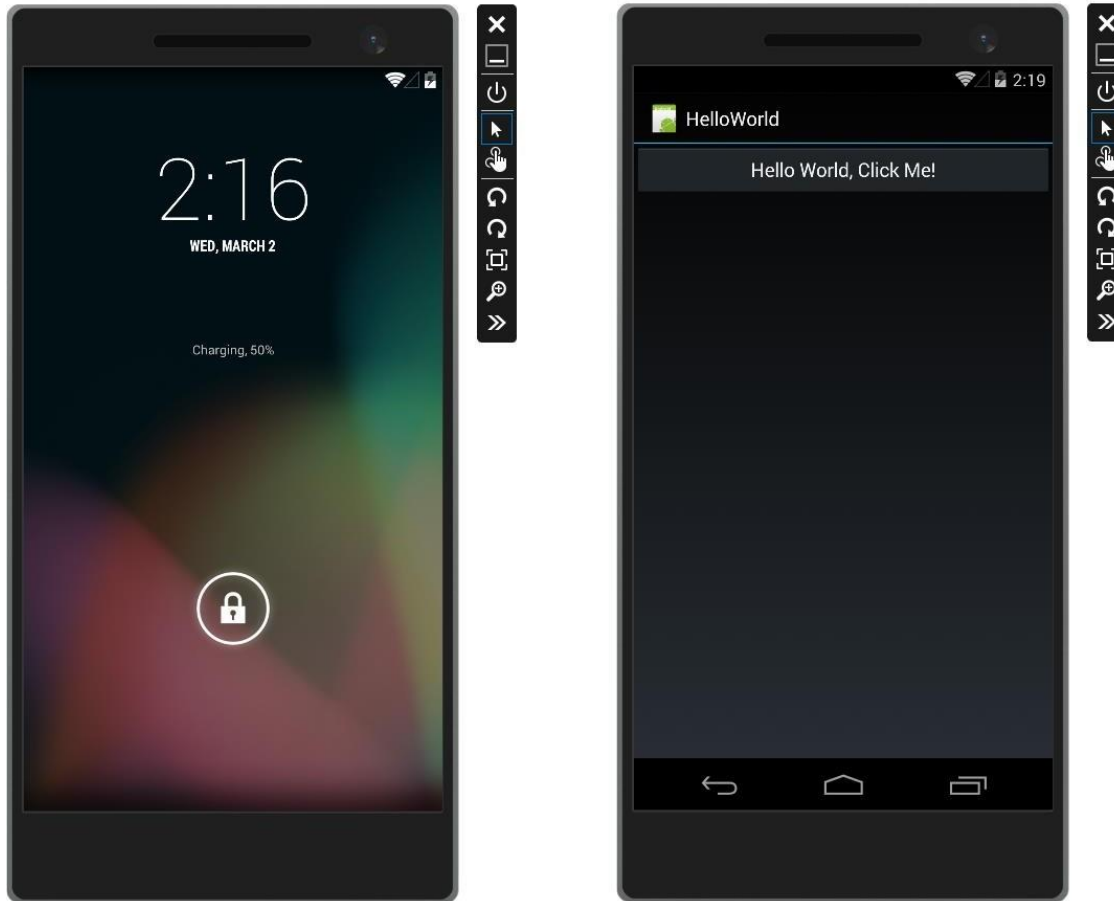Launch Standalone SDK Manager

IDE : Android Studio
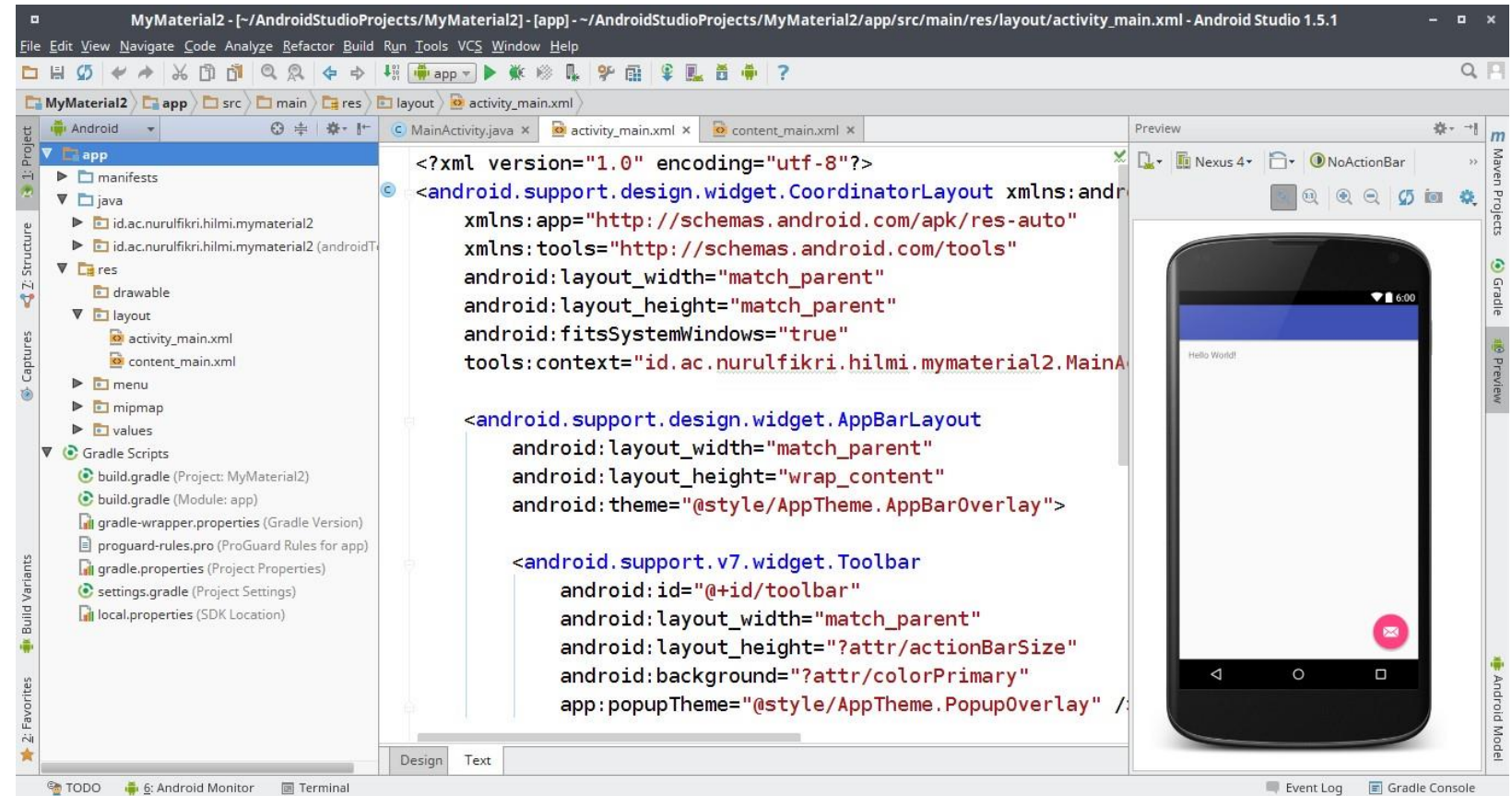
IDE : Android Studio

1. Tab Tools
2. Tab Navigasi
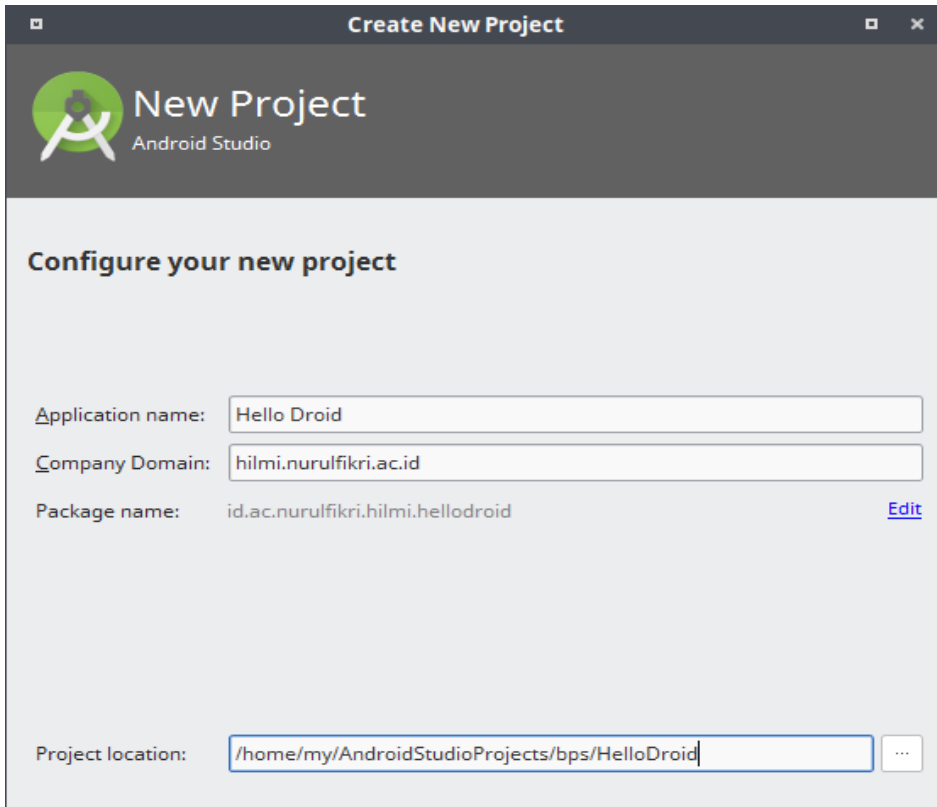3. Window Editor
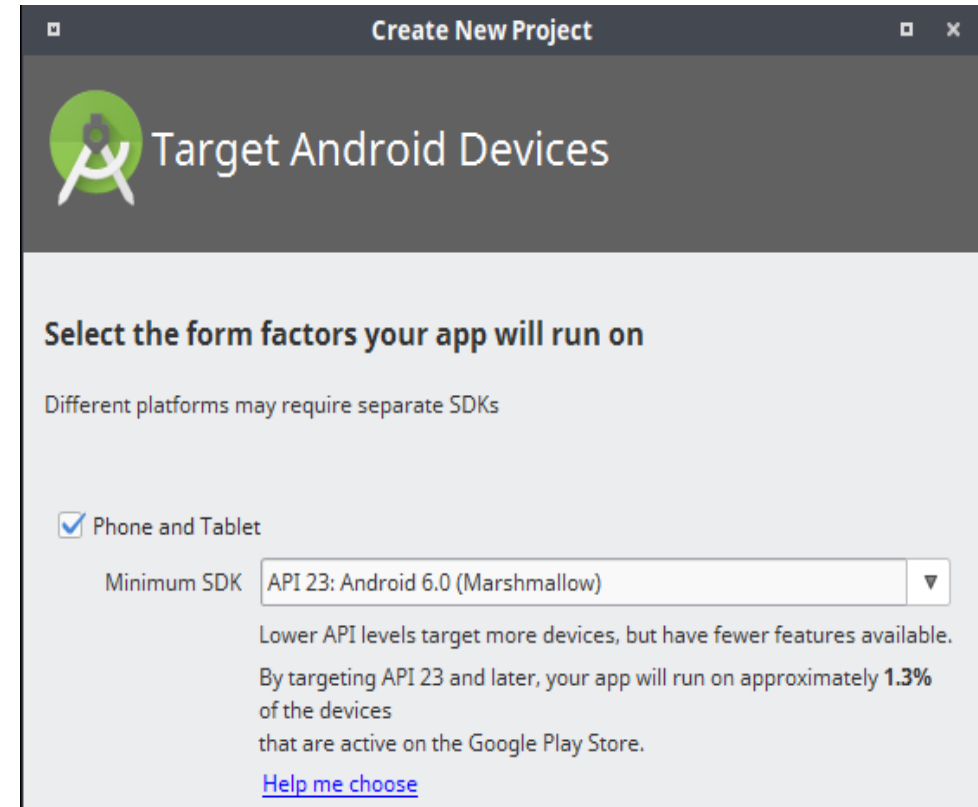4. Window Tools
5. Tab status
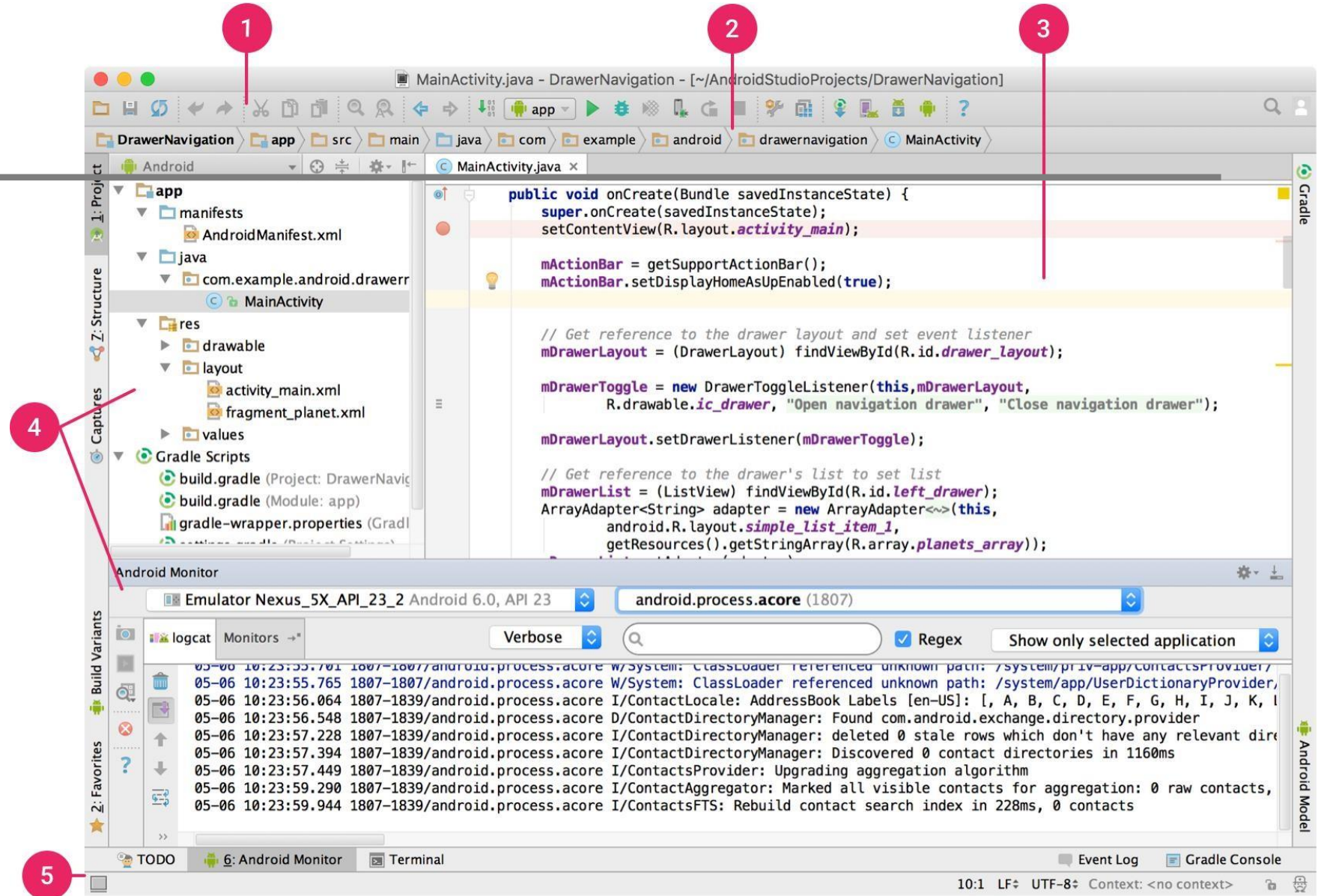
Emulator

AVD

Genymotion

Hello Droid

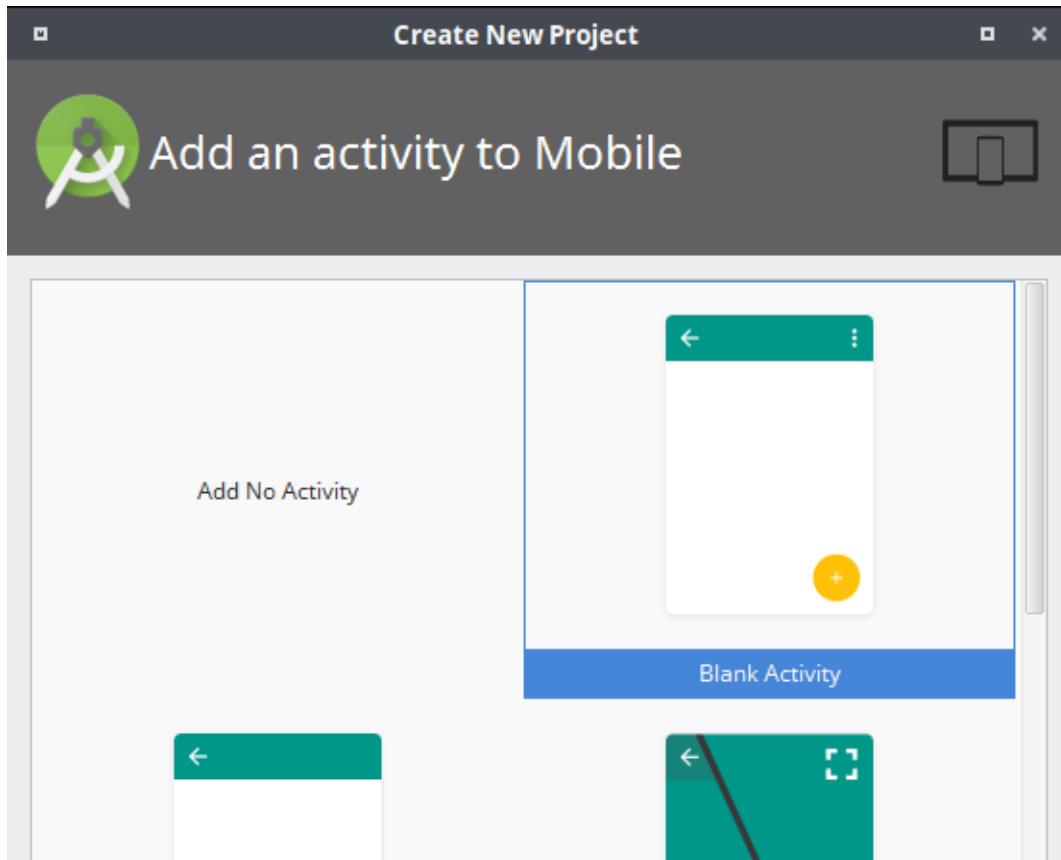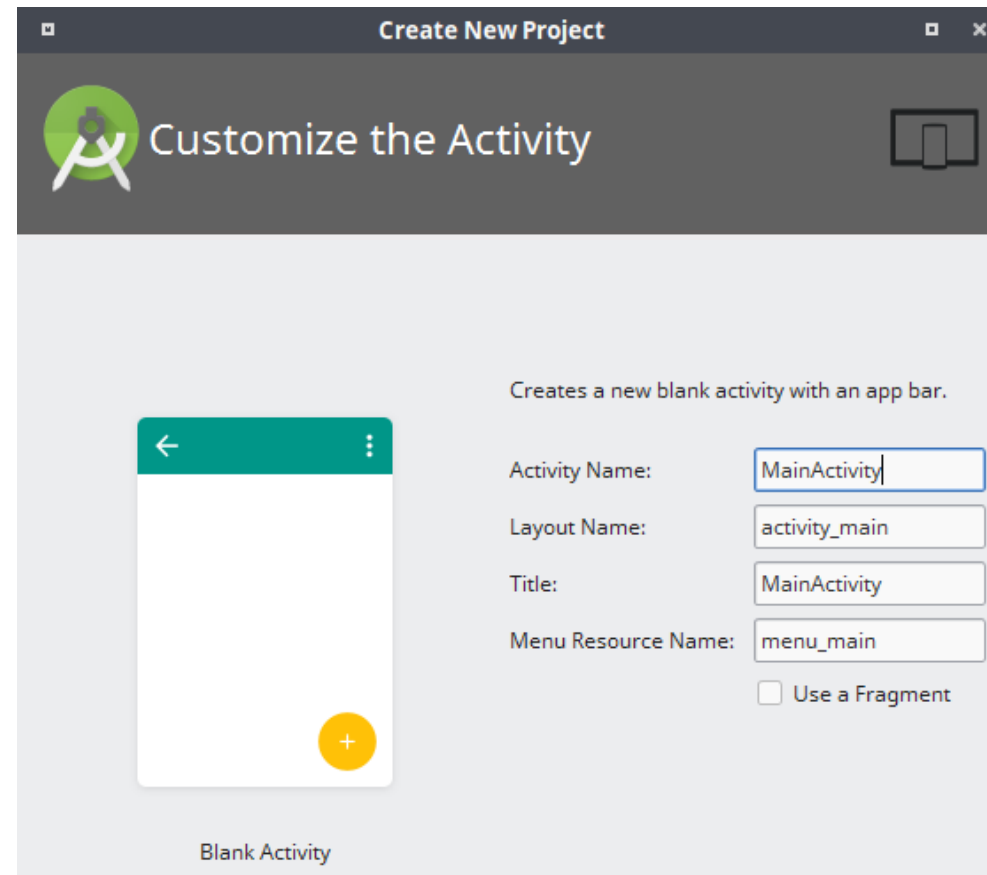✓Open Android Studio – Create New Project – Set Minimum API
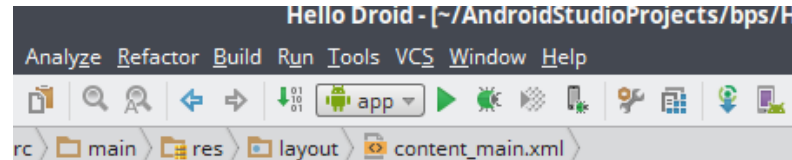
Hello Droid
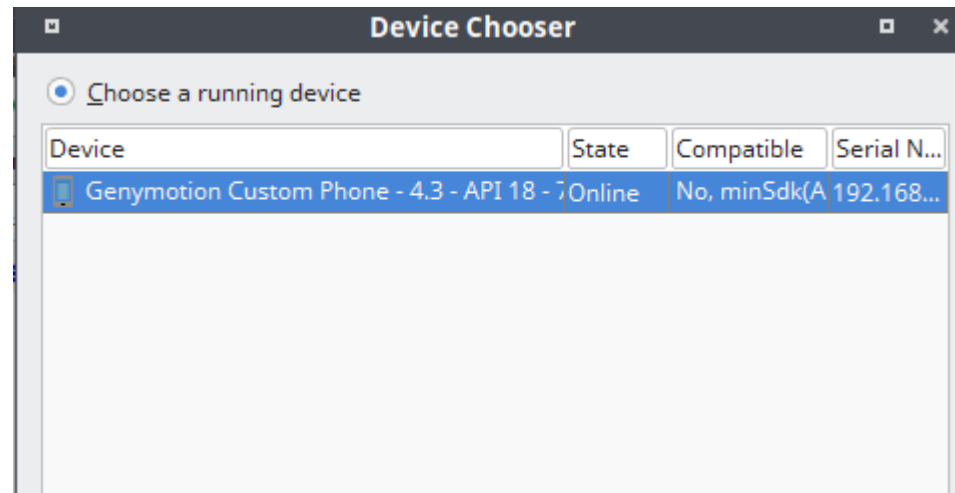
✓ Set Template App

Hello Droid

✓ Configure Activity

Hello Droid

✓ Run Emulator (AVD / Genymotion / Smartphone Programming Mode On)
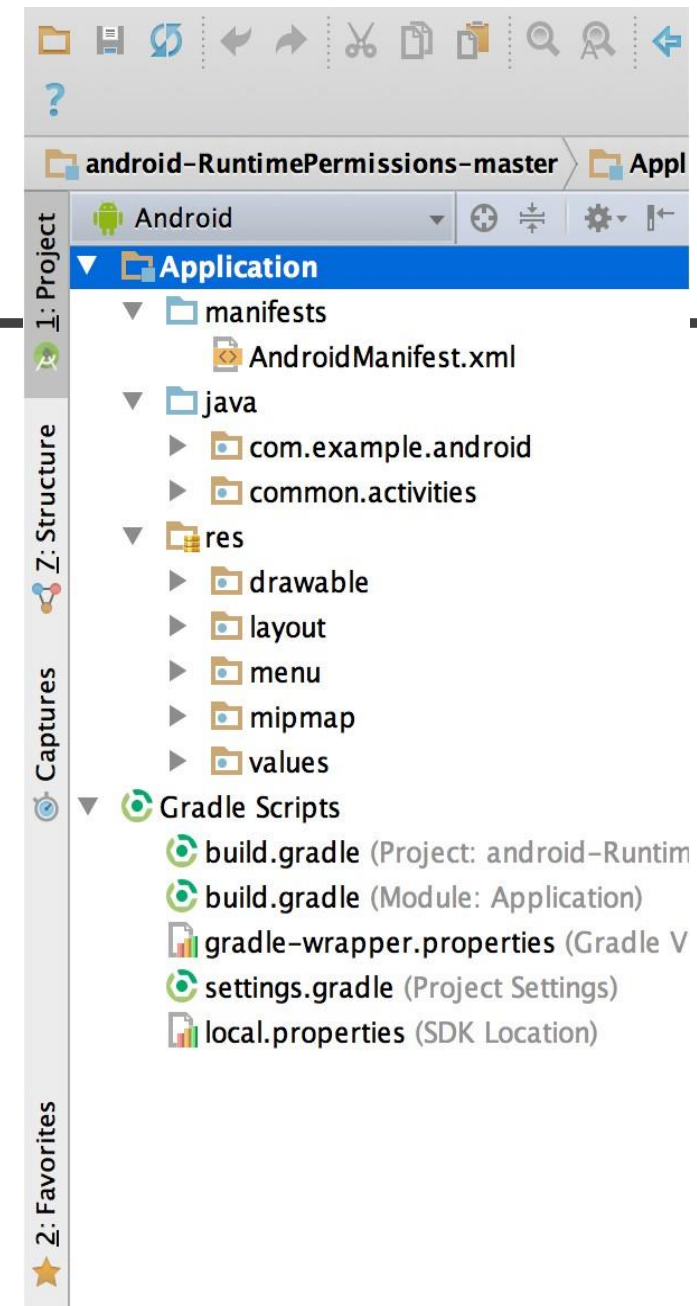✓ Run Project

✓ Choose Target

Android Project Structure

- ✓ Android Manifest
- ✓ Java Code
  - ✓ Activity
  - ✓ Java Class
- ✓ Resources files:
  - ✓ Layout
  - ✓ Values
  - ✓ Assets
- ✓ Gradle Scripts
  - ✓ Build
  - ✓ setting

Android Project Structure

✓ AndroidManifest (XML)
  - ✓ Tempat mendaftarkan seluruh Activity
  - ✓ Seting akses resouces berupa permission:
    - ✓ storage
    - ✓ camera
    - ✓ internet
    - ✓ other devices

```xml
AndroidManifest.xml ×
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example"
    android:versionCode="1"
    android:versionName="1.0">

<uses-sdk android:minSdkVersion="15" />

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

<application
    android:label="@string/app_name"
    android:icon="@drawable/ic_launcher">
    <activity
        android:name="MyActivity"
        android:label="@string/app_name">
        <intent-filter>
            <action android:name="android.intent.action.MAIN" />
            <category android:name="android.intent.category.LAUNCHER" />
        </intent-filter>
    </activity>
</application>
</manifest>
```
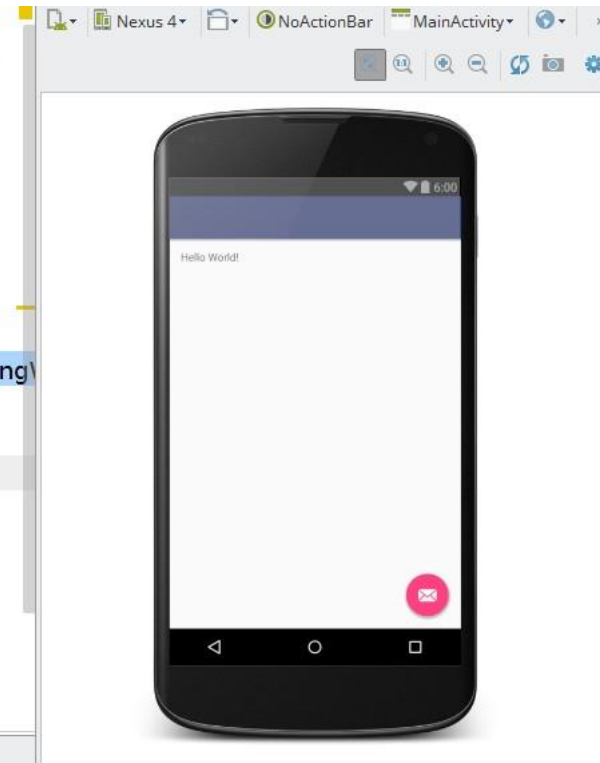
Android Project Structure

✓Resources : Layout (XML)

Android Project Structure

✓ Activity (Java)

Gradle

- Build tools yang digunakan pada Android Studio Activity : didalamnya termasuk proses compile,update system, import liblary
- Digunakan untuk proses versioning system
- Disediakan oleh Android Plugin for Gradle
- Fitur gradle:
  - Menyesuaikan, mengkonfigurasi dan memperluas proses pembuatan
  - Konfigurasi setingan APK untuk aplikasi android
  - Penggunaan reusable kode program berupa import archive *.jar

Latihan :

✓ Ubah "Hello World" ke "Hello Droid"