Android Developer Fundamentals V2

Build your first app

Lesson 1

Introduction to Android

1.0 Introduction to Android

Contents

- Android is an ecosystem
- Android platform architecture
- Android Versions
- Challenges of Android app development
- App fundamentals

Android Ecosystem

Introduction to Android

What is Android?

- Mobile operating system based on Linux kernel
- User Interface for touch screens
- Used on over 80% of all smartphones
- Powers devices such as watches, TVs, and cars
- Over 2 Million Android apps in Google Play store
- Highly customizable for devices / by vendors
- Open source

Android user interaction

- Touch gestures: swiping, tapping, pinching

- Virtual keyboard for characters, numbers, and emoji

- Support for Bluetooth, USB controllers and peripherals

Android and sensors

Sensors can discover user action and respond

- Device contents rotate as needed

- Walking adjusts position on map

- Tilting steers a virtual car or controls a physical toy

- Moving too fast disables game interactions
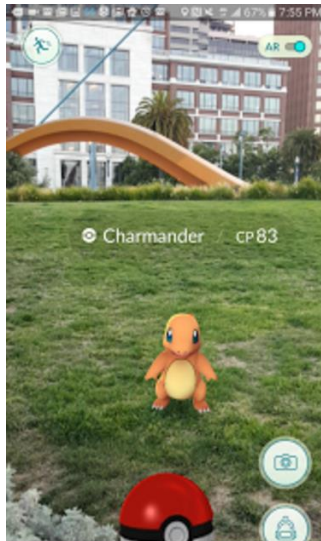
Android home screen

- Launcher icons for apps

- Self-updating widgets for live content

- Can be multiple pages

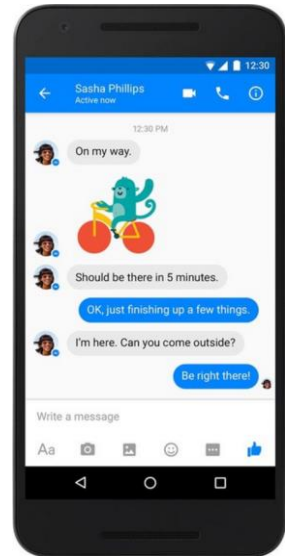- Folders to organize apps

- "OK Google"
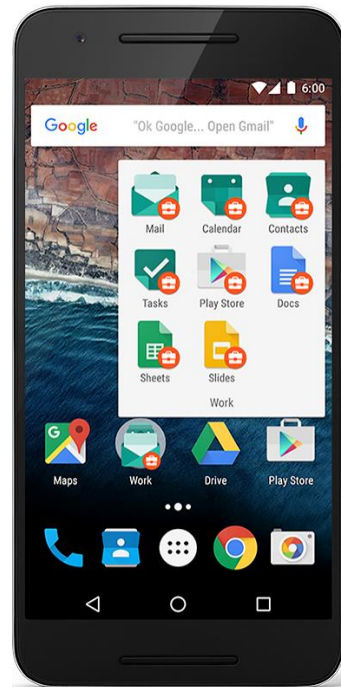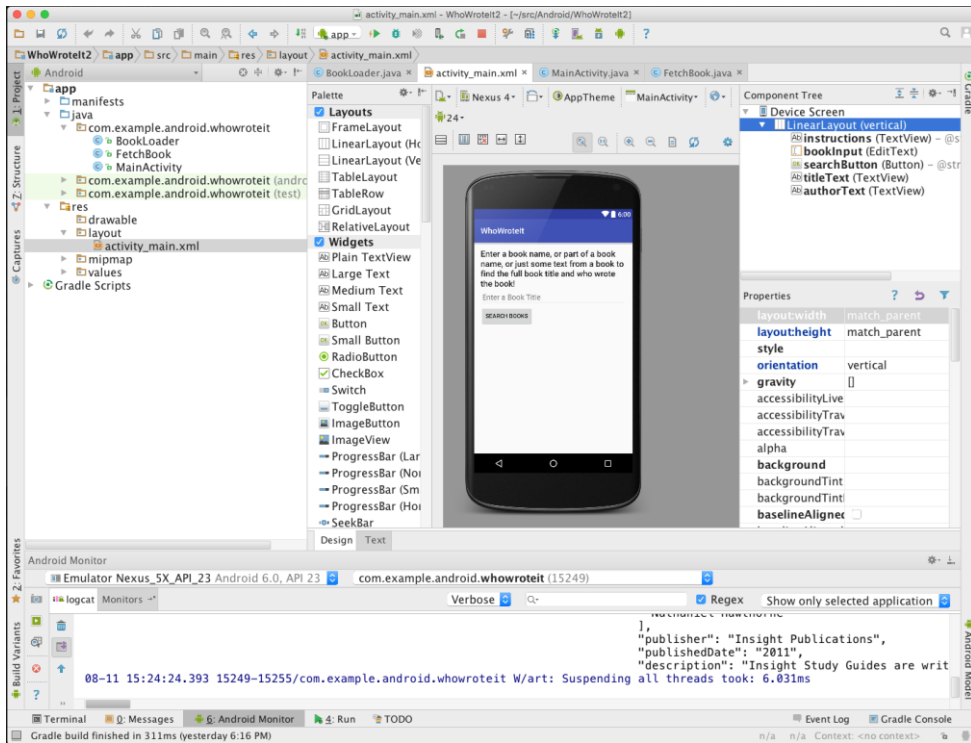
Android app examples
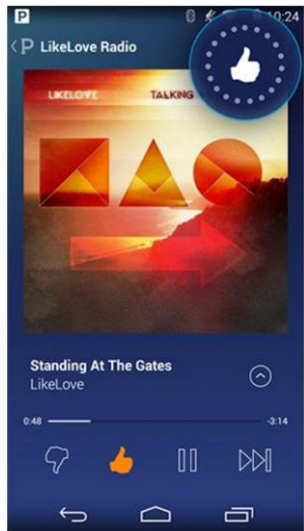
Pandora

Pokemon GO

Facebook
Messenger

Android Software Developer Kit (SDK)

- Development tools (debugger, monitors, editors)

- Libraries (maps, wearables)

- Virtual devices (emulators)

- Documentation (developers.android.com)

- Sample code

Android Studio

- [Official Android IDE](#)
- Develop, run, debug, test, and package apps
- Monitors and performance tools
- Virtual devices
- Project views
- Visual layout editor

Google Play store
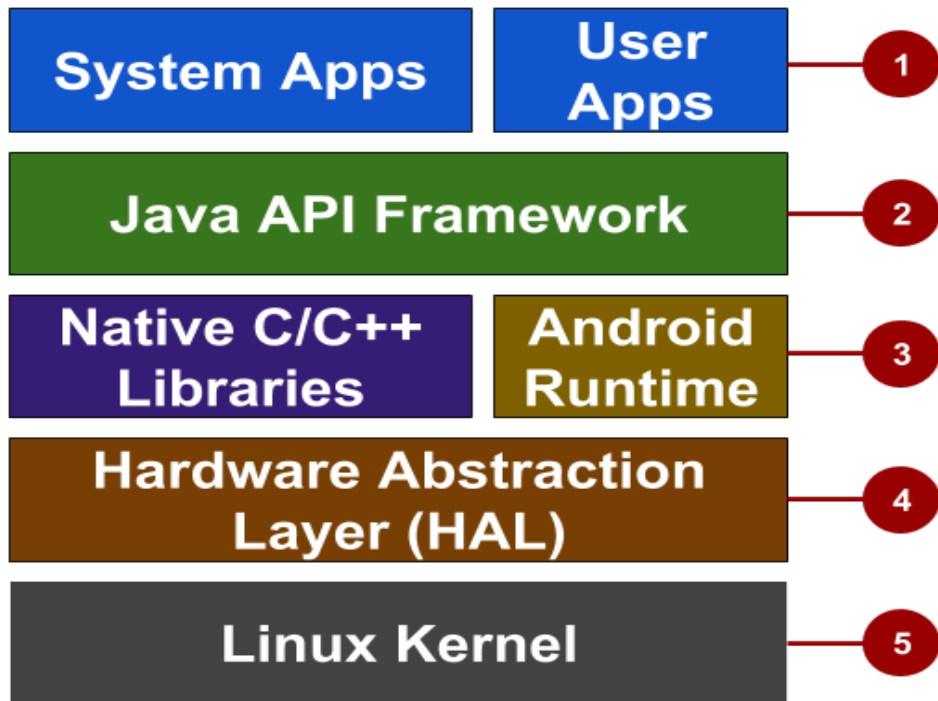
Publish apps through [Google Play](#) store:

- Official app store for Android
- Digital distribution service operated by Google

Android Platform Architecture

Android stack

1. System and user apps
2. Android OS API in Java framework
3. Expose native APIs; run apps
4. Expose device hardware capabilities
5. Linux Kernel

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System and user apps

- System apps have no special status
- System apps provide key capabilities to app developers

Example:

Your app can use a system app to deliver a SMS message.

Java API Framework

The entire feature-set of the Android OS is available to you through APIs written in the Java language.

- View class hierarchy to create UI screens
- Notification manager
- Activity manager for life cycles and navigation

Android runtime

Each app runs in its own process with its own instance of the Android Runtime.

C/C++ libraries

- Core C/C++ Libraries give access to core native Android system components and services.

Hardware Abstraction Layer (HAL)

- Standard interfaces that expose device hardware capabilities as libraries

  Examples: Camera, bluetooth module

Linux Kernel

- Threading and low-level memory management
- Security features
- Drivers

Older Android versions

Codename	Version	Released	API Level
Honeycomb	3.0 - 3.2.6	Feb 2011	11 - 13
Ice Cream Sandwich	4.0 - 4.0.4	Oct 2011	14 - 15
Jelly Bean	4.1 - 4.3.1	July 2012	16 - 18
KitKat	4.4 - 4.4.4	Oct 2013	19 - 20
Lollipop	5.0 - 5.1.1	Nov 2014	21 - 22

Android History and Platform Versions for more and earlier versions before 2011

Newer Android versions

Codename	Version	Released	API Level
Marshmallow	6.0 - 6.0.1	Oct 2015	23
Nougat	7.0 - 7.1	Sept 2016	24 - 25
Oreo	8.0 - 8.1	Sept 2017	26 - 27
Pie	9.0	Aug 2018	28

Introduction to Android

App Development

What is an Android app?

- One or more interactive screens
- Written using Java Programming Language and XML
- Uses the Android Software Development Kit (SDK)
- Uses Android libraries and Android Application Framework
- Executed by Android Runtime Virtual machine (ART)

Challenges of Android development

- Multiple screen sizes and resolutions
- Performance: make your apps responsive and smooth
- Security: keep source code and user data safe
- Compatibility: run well on older platform versions
- Marketing: understand the market and your users
  (Hint: It doesn't have to be expensive, but it can be.)

App building blocks

- Resources: layouts, images, strings, colors as XML and media files
- Components: activities, services, and helper classes as Java code
- Manifest: information about app for the runtime
- Build configuration: APK versions in Gradle config files

Learn more

- Android History
- Introduction to Android
- Platform Architecture
- UI Overview
- Platform Versions
- Supporting Different Platform Versions
- Android Studio User's Guide

What's Next?

- Concept Chapter: <u>1.0 Introduction to Android</u>

- No Practical

END