The X Course: Android

Introduction to Course

Who am I ?

twitter.com/zawawy__

amr22.elzawawy@gmail.com

linkedin.com/in/elzawawy/

What is this course ?

- An intensive introductory android course.
- Discuss main topics and components in Android.
- **Target:** A gentle PUSH to the real android track.

Who is this course for ?

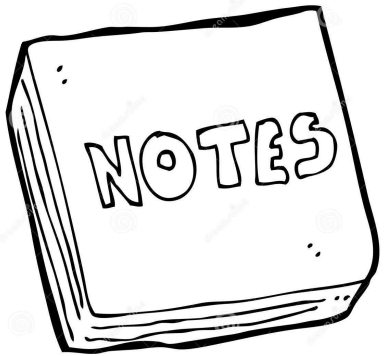
- No age preference- Only knowledge preference.
- Java & OOP are prerequisites.
- Enthusiasts about how android apps are built.

Course material accreditations

- Programming Mobile Applications for Android Handheld Systems by University of Maryland, College Park
- Android Programming: The Big Nerd Ranch Guide by Bill Phillips, Chris Stewart, Brian Hardy and Kristin Marsicano
- Blink22, my company

Take notes to self.

- You are here to learn, you are not in the school or college !
- Ask, ask, ask and ASK !
- Transfer of Knowledge is key.



The X Course: Android

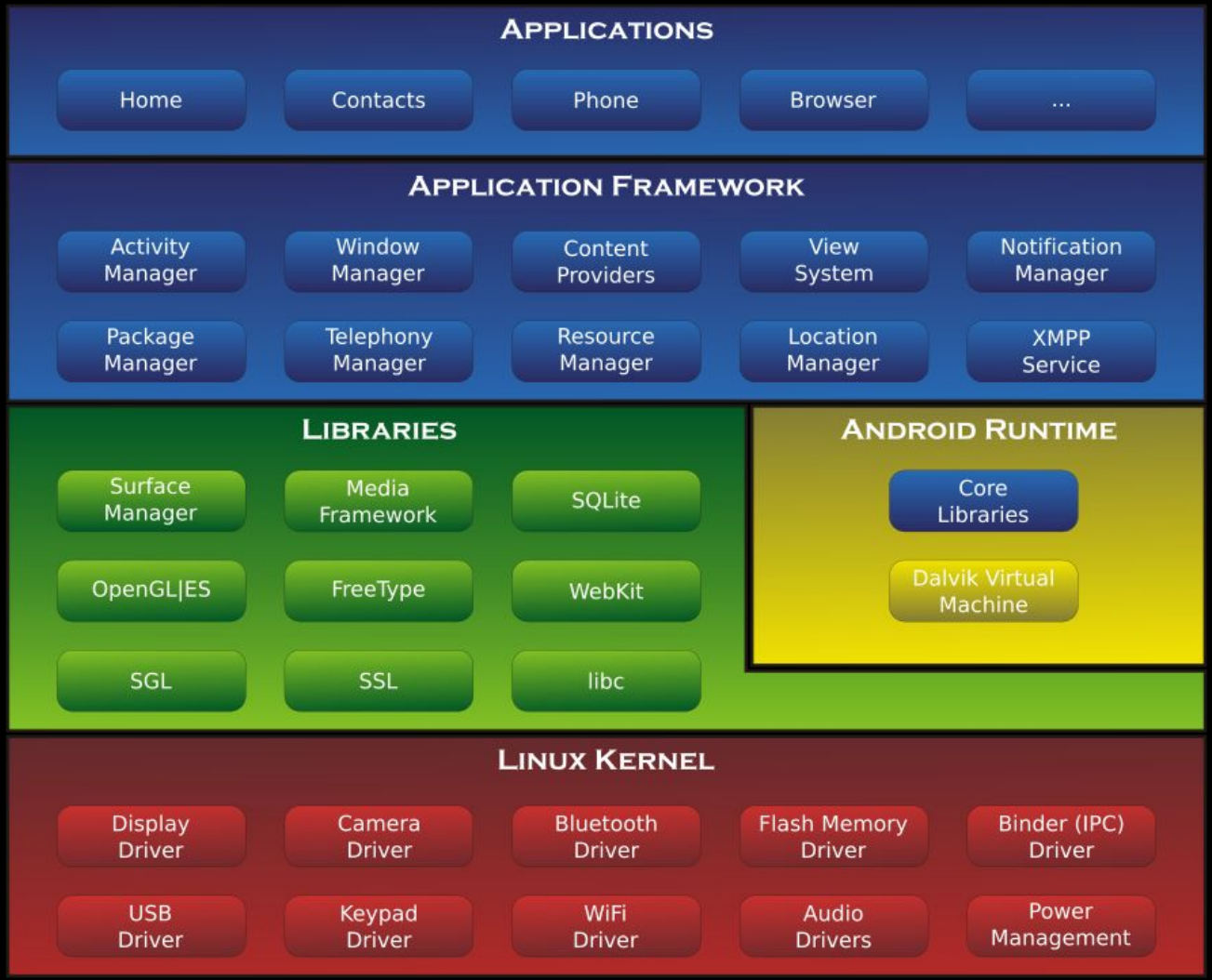
Session 1

Agenda

- Introduction to the Android Platform.
- Application Components.
- Intents
- Manifest File
- Resources
- Write our fist app: GeoQuiz

Introduction to the Android Platform

- An OS for mobile devices from outside.
- A software architecture stack for mobile devices on a closer look.
- Details on this stack are advanced.
- **Target:** Brief on each layer is discussed instead


Applications
Home
Contacts
Phone
Browser
...
Application Framework
Activity Manager
Window Manager
Content Providers
View System
Notification Manager
Package Manager
Telephony Manager
Resource Manager
Location Manager
XMPP Service
Libraries
Surface Manager
Media Framework
SQLite
OpenGL|ES
FreeType
WebKit
SGL
SSL
libc
Android Runtime
Core Libraries
Dalvik Virtual Machine
Linux Kernel
Display Driver
Camera Driver
Bluetooth Driver
Flash Memory Driver
Binder (IPC) Driver
USB Driver
Keypad Driver
WiFi Driver
Audio Drivers
Power Management

Introduction to the Android Platform

- Android apps can be written using **Kotlin, Java, and C++ languages.**
- **APK file** contains all of an Android app and android-powered devices use it to install the app.

Application Components

- Activities.
- Services.
- Broadcasts receivers.
- Content providers.

Application Components: Activities

- It represents a single screen with a user interface.
- You implement an activity as a subclass of the Activity class.

Application Components: Services

- It runs in the background to perform long-running operations or to perform work for remote processes.
- A service does not provide a user interface, **means that user may not know it is running.**
- *Background vs Foreground services.*

Application Components: Broadcast Receivers

- Allowing the app to respond to system-wide broadcast announcements.
- The system can deliver broadcasts even to apps that aren't currently running.
- A broadcast receiver is just a *gateway* to other components and is intended to do a very minimal amount of work.

Application Components: Content Providers

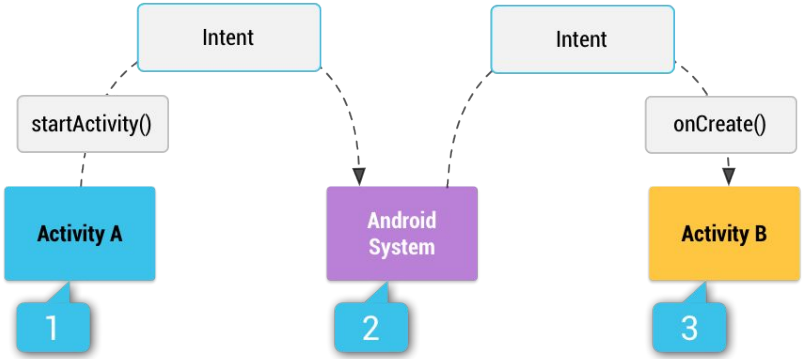
- A shared set of **app data** that you can store in the file system, in a SQLite database, on the web, or on any other persistent storage location that your app can access.
- Other apps can query or modify the data if the provider allows it.
- Content providers are also useful for reading and writing data that is private to your app and not shared.

Intents: Activating Components

- A messaging object you can use to request an action from another app component.
- Bind individual components to each other at runtime.
- You can start an activity to receive a result, in which case the activity also returns the result in an `Intent`.
- Content providers are not activated by intents.

Intents: The Types

- Explicit intents, *specify which application will satisfy the intent*
- Implicit intents, *do not name a specific component, but instead declare a general action to perform*



Manifest File

- Declaring components and capabilities through Intent Filters.
- Identifies any user permissions the app requires.
- Declares the minimum API Level required by the app.
- Declares hardware and software features used or required by the app.

Manifest File: Intent Filter Example

```
<manifest ... >
    ...
    <application ... >
        <activity android:name="com.example.project.ComposeEmailActivity">
            <intent-filter>
                <action android:name="android.intent.action.SEND" />
                <data android:type="*/*" />
                <category android:name="android.intent.category.DEFAULT" />
            </intent-filter>
        </activity>
    </application>
</manifest>
```

Resources

```
    res/
        drawable/
            graphic.png
        layout/
            main.xml
            info.xml
        mipmap/
            icon.png
        values/
```

arrays.xml for resource arrays (typed arrays).
colors.xml for color values
dimens.xml for dimension values.
strings.xml for string values.
styles.xml for styles.

Let’s write our first App !

Further Readings for this session

- http://www.tutorialspoint.com/android/android_architecture.htm
- https://en.wikipedia.org/wiki/Android_%28operating_system%29
- https://developer.android.com/guide/components/intents-filters#Types
- https://developer.android.com/guide/components/fundamentals.html#Resources
- https://developer.android.com/guide/topics/resources/providing-resources.html
- https://developer.android.com/guide/topics/manifest/manifest-intro.html