

# Lecture Notes

## Operating System Review & Android Introduction

### 1. Chapter Objectives

Introduction to the architecture of Android, the MVC model and compilation in Android programming.

### 2. Architecture

Four main layers:

- Applications: written in Java, main focus for the course. Example: weather, contacts, phone, browsers, etc.
- Application Framework: higher level, also in Java, UI, Location Service, Notification, etc.
- Libraries: mainly in C, C++, low level.
- Linux Kernel: well-shaped, secured, active development.

### 3. Compilation

- Java compiler: compile once, run on multiple platforms.
- Android Virtual Machines
  - Dalvik: the runtime, bytecode, and VM used by the Android system for running Android applications.
  - ART (Android RunTime): next version of Dalvik, faster, improved Garbage Collection (GC), first introduced in Android KitKat.

### 4. MVC Model

- Model: manages behavior and data.
- View: manages the display of information.
- Controller: controls the data flow into model object and updates the view whenever data changes.

### 5. Controllers

- Context

- Central command center.
- System services.
- Access application-specific data.
- Application
  - A context.
  - Can be subclassed.
  - Android memory management.
  - AndroidManifest.xml.
- Activity
  - Fundamental building block.
  - Has a unique task or purpose.
  - Every application has at least one activity.
  - Handles display of single screen.
- Activity lifecycle
  - onCreate() : initialization.
  - onStart(): visible state.
  - onPause(): Stop animation or heavy tasks, save unsaved changes.
  - onResume(): Called when activity comes to foreground.
  - Screen orientation
    - onSaveInstanceState()
    - onDestroy()
  - New activity instance
    - onCreate()
    - onRestoreInstanceState()
  - Close current activity: finish()
  - Intent: used to move from one activity to another.
- Fragment
  - A behavior or a portion of the UI.
  - Building block of the Fundamental building blocks.
  - Optional.
  - Officially supported from Honeycomb [API 11].
  - Similar lifecycle as Activity.