

Android App Develop

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Android App Develop

- Pre-knowledge: Java
- Live demo and coding
 - Each topic associated with sample APPs design
- Basic layout and view
- Lifecycle
- App and API
- Baas, Firebase

Java Quizzes

- Which of the following are synonyms?
 1. instance
 2. attributes
 3. method
 4. object
 5. function
 6. variable
 7. class

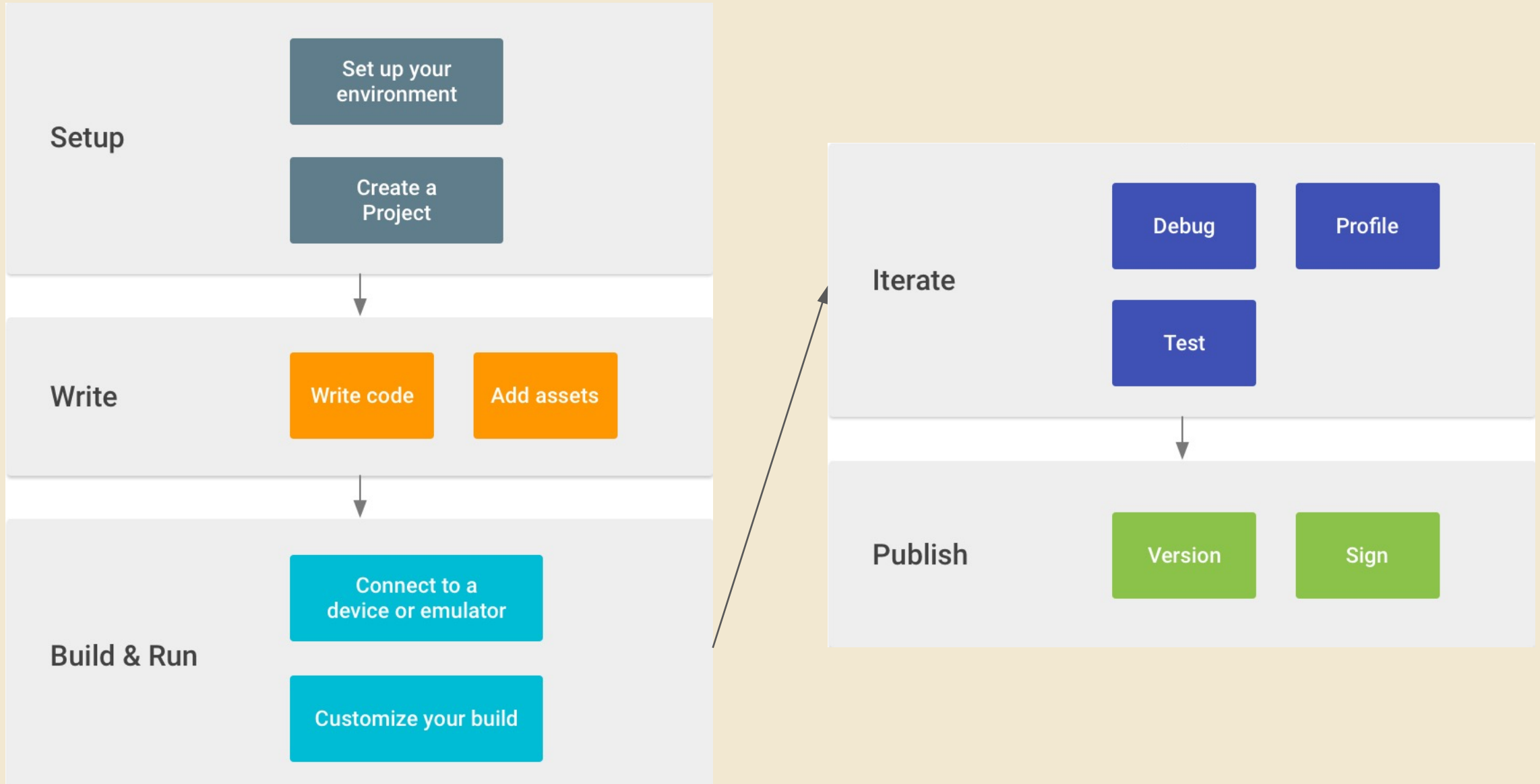
Java Quizzes

- Which of the following is frequently used when class inheritance?
 1. overload
 2. override
 3. overflow
 4. overwrite

Java Quizzes

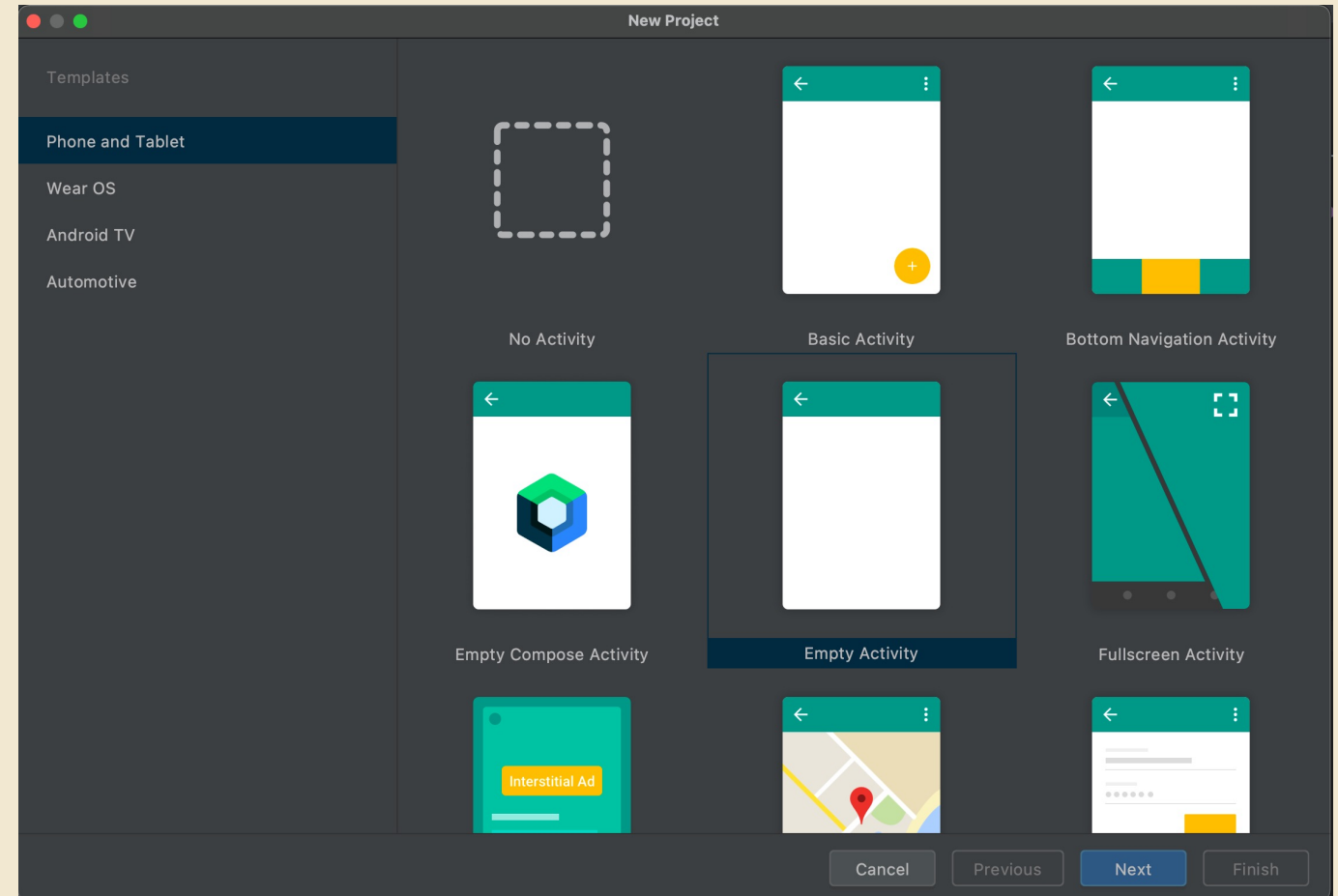
- Please explain each keyword in Java of the meaning and usage?
 - abstract
 - final
 - static
 - private

Developer Workflow Basics

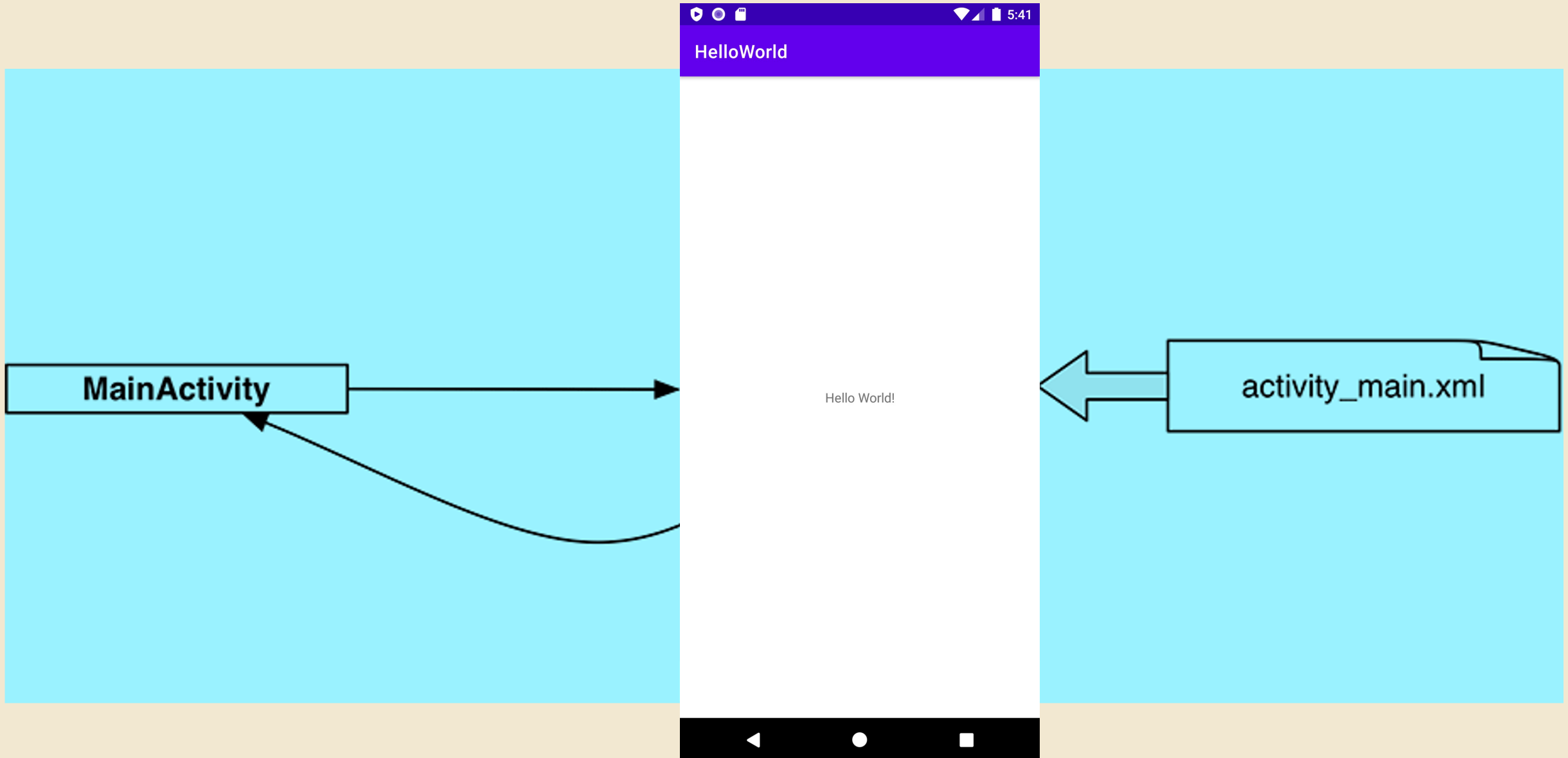


Android Studio

- Install Android Studio (Version 2020.3.1) (Please install it before class)
- Create Hello World app
- Add log statements

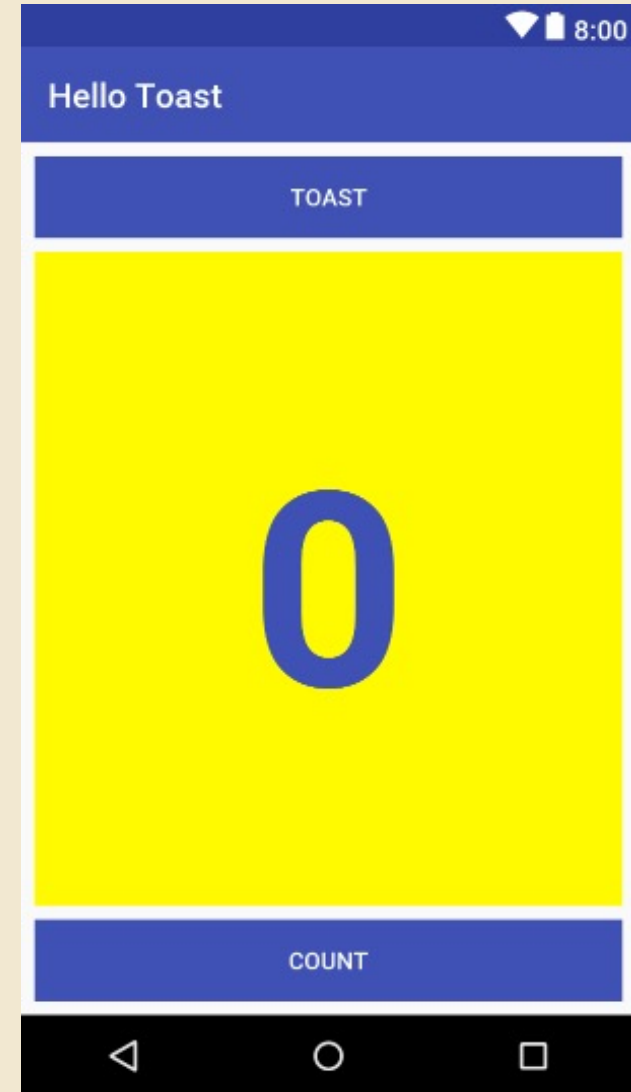


MainActivity



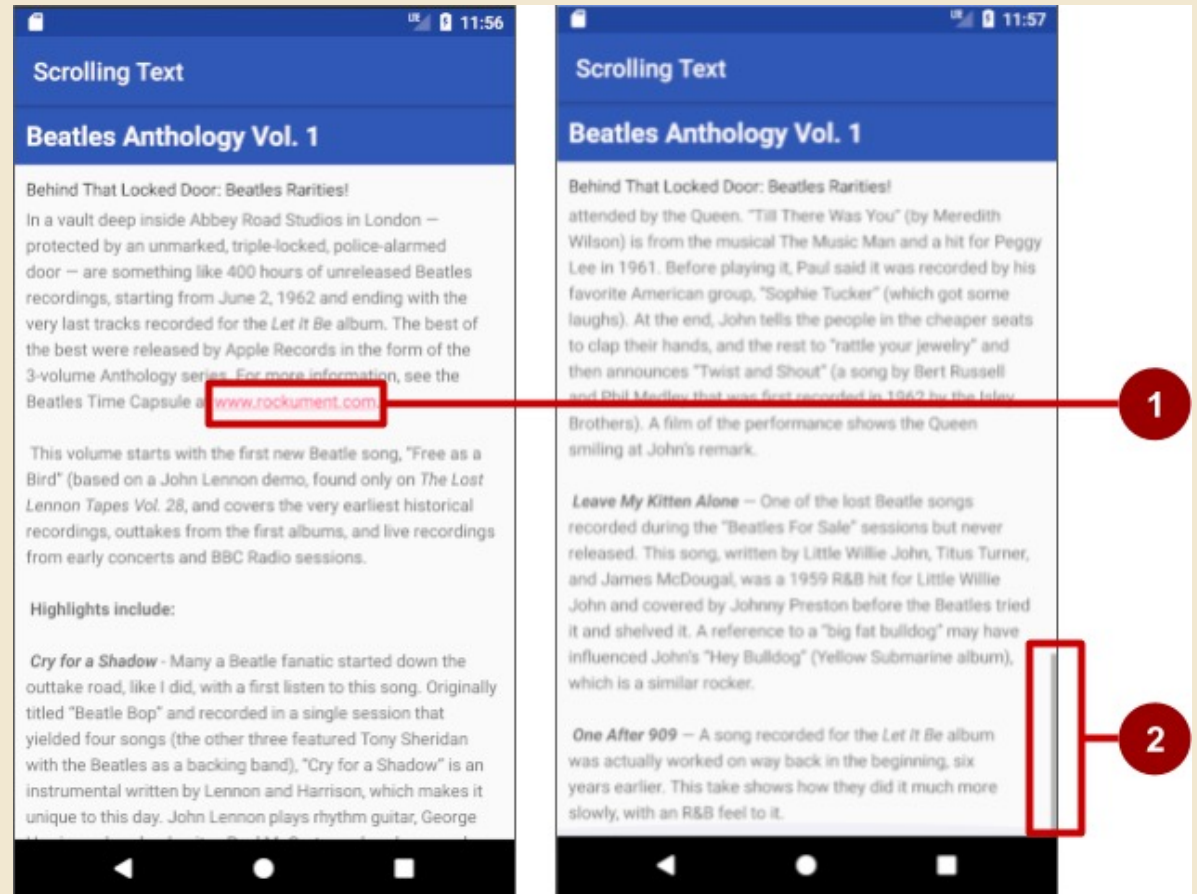
First Interactive

- Add View elements in the layout editor
 - Constraints
 - Button
 - TextView
- Edit the layout in XML
- Add onClick handlers for the buttons
- Create layout variants
 - ConstraintLayout
 - LinearLayout
 - RelativeLayout



Text and Scrolling Views

- Add and edit TextView elements
- Add a ScrollView and an active web link
- Scroll multiple elements



Question

- How many views can you use within a ScrollView? Choose one:
 - One view only
 - One view or one view group
 - As many as you need

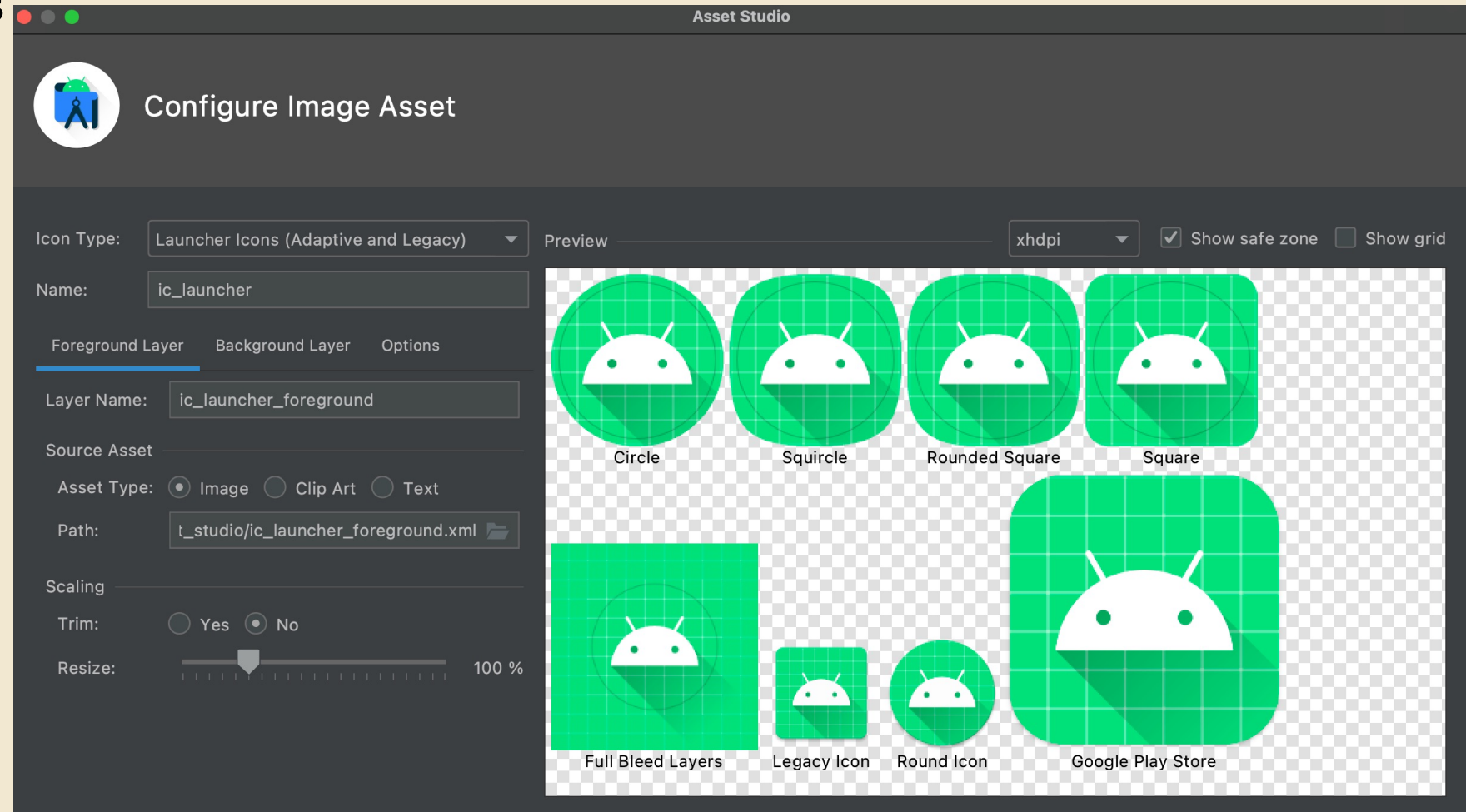
Question

- Which XML attribute do you use to define the width of the LinearLayout inside the scrolling view? Choose one:
 - `android:layout_width="wrap_content"`
 - `android:layout_width="match_parent"`
 - `android:layout_width="200dp"`

- Which constructor method do you use to create a new explicit Intent? Choose one:
 1. `new Intent()`
 2. `new Intent(Context packageContext, Class<?> cls)`
 3. `new Intent(String action, Uri uri)`
 4. `new Intent(String action)`

Some Project Settings

- Change the launcher icon
- Use project templates



Activities and Intents

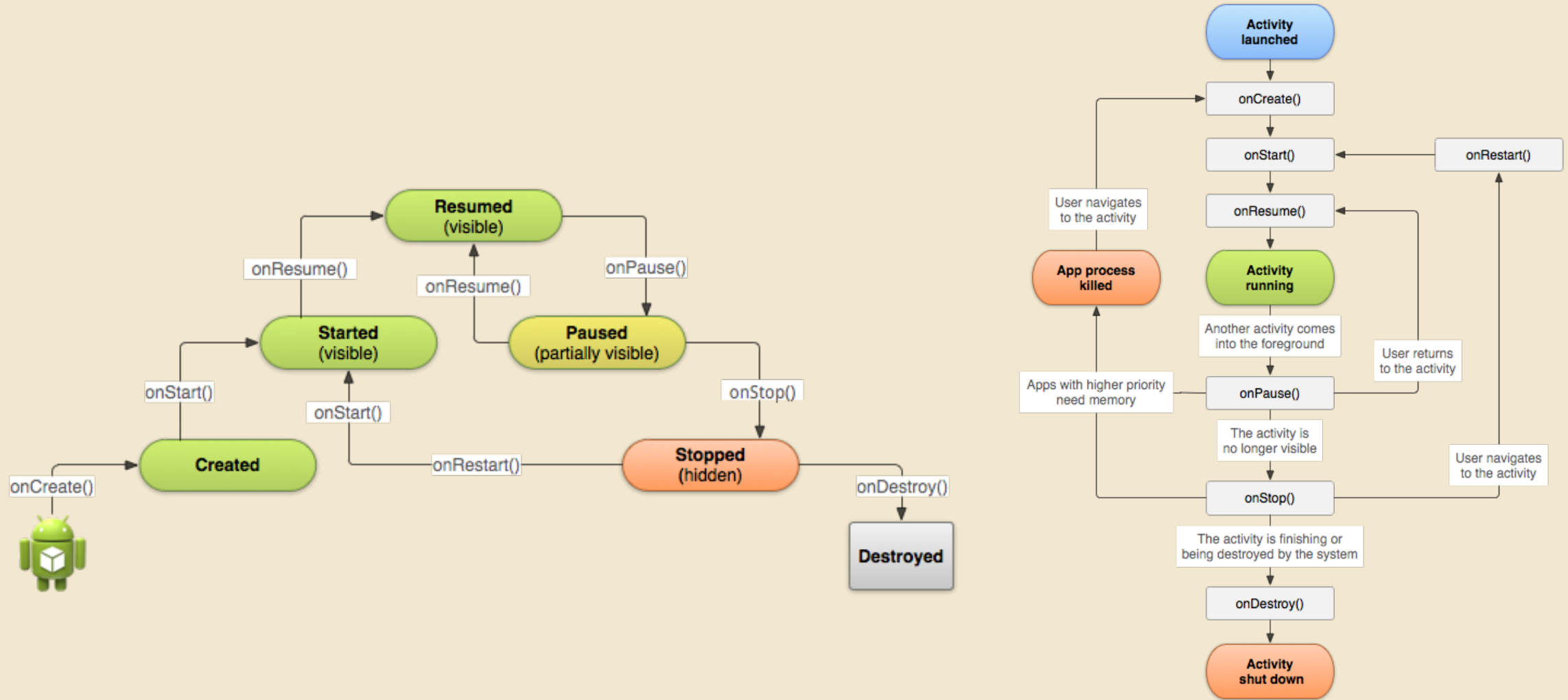
- An Activity represents a single screen in your app with which your user can perform a single, focused task
- An activity is started or activated with an intent.
- An Intent is an asynchronous message that you can use in your activity to request an action from another activity, or from some other app component.

- Create the TwoActivities project
- Send data from the main Activity to the second Activity

Activity Lifecycle and State

- Nonexistent represents an activity that has not been launched yet or an activity that was just destroyed
- Stopped represents an activity that has an instance in memory but whose view is not visible on the screen.
- Paused represents an activity that is not active in the foreground but whose view is visible or partially visible.
- Resumed represents an activity that is in memory, fully visible, and in the foreground.

Activity-Lifecycle Concepts



Implement Callbacks and Save/Restore Activity State

- onStart()
- onPause()
- onRestart()
- onResume()
- onStop()
- onDestroy()

- onSaveInstanceState()
 - The state information of some of the View elements are automatically saved across configuration changes, but some View elements are not

Explicit and Implicit Intent

- Intent
 - Description of an operation to be performed
 - Messaging object used to request an action from another app component via the Android system
 - An Intent can be used to:
 - start an Activity
 - start a Service
 - deliver a Broadcast
- Explicit intent
 - Carry out an activity in your app, or in a different app, by sending an intent with the fully qualified class name of the activity
- Implicit intent
 - Initiate an activity without knowing which app or activity will handle the task

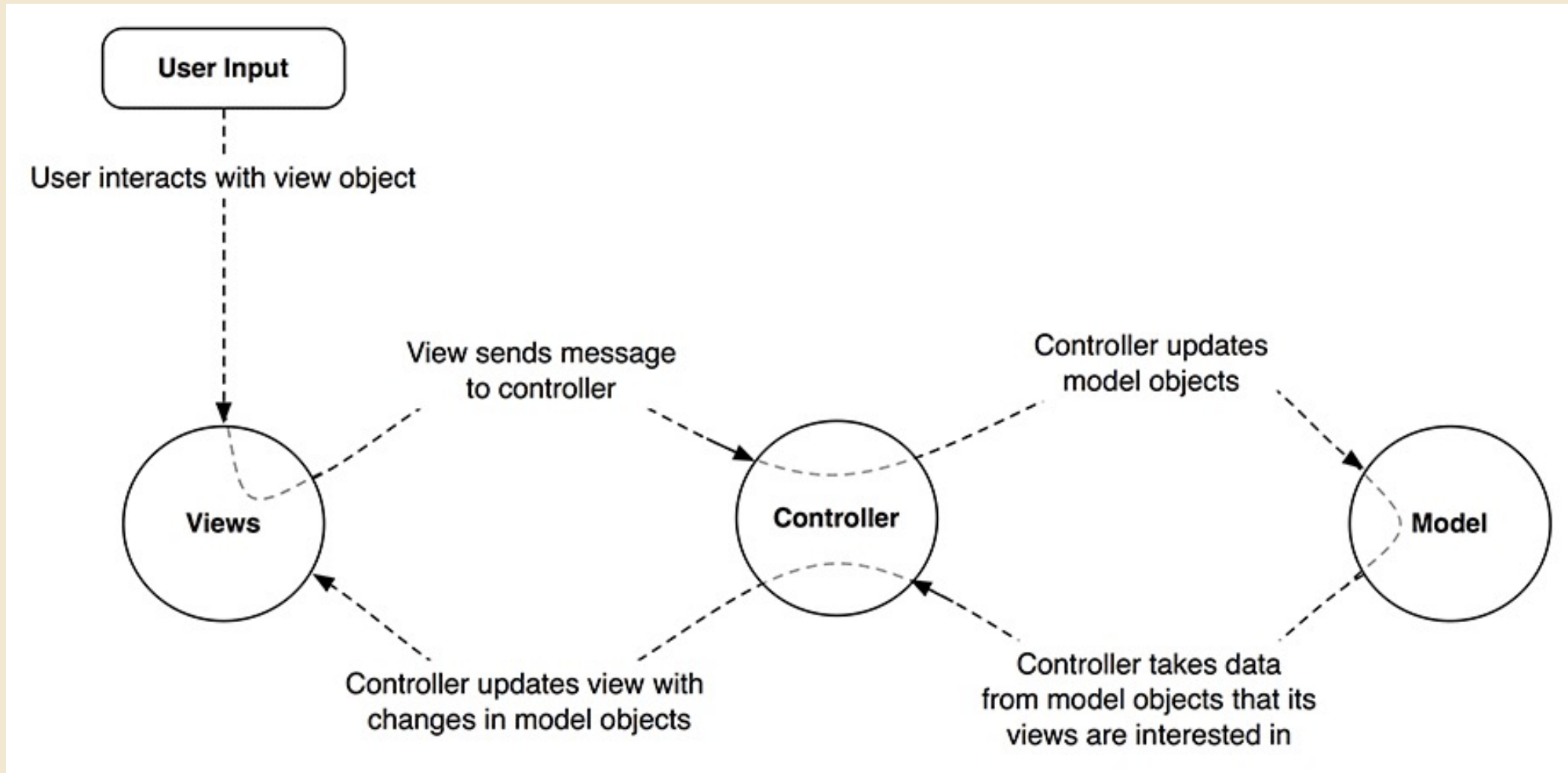
Common Actions for An Implicit Intent

- Common actions include:
 - [ACTION_SET_ALARM](#)
 - [ACTION_IMAGE_CAPTURE](#)
 - [ACTION_CREATE_DOCUMENT](#)
 - [ACTION_SENDTO](#)
 - and many more
- Challenge
 - It displays a **Take a Picture** button at the bottom of the app.
 - When clicked, the button launches a camera app on the device.

Model-View-Controller and Android

- Model objects hold the application's data and “business logic.” Model objects have no knowledge of the UI; their sole purpose is holding and managing data.
 - In Android applications, model classes are generally custom classes you create. All of the model objects in your application compose its model layer.
- View objects know how to draw themselves on the screen and how to respond to user input, like touches.
 - Android provides a wealth of configurable view classes. You can also create custom view classes. An application's view objects make up its view layer.
- Controller objects tie the view and model objects together. They contain “application logic.”
 - Controllers are designed to respond to various events triggered by view objects and to manage the flow of data to and from model objects and the view layer.

MVC



App MVC Architecture

Model

Question

Controller

MainActivity

View (Layouts)

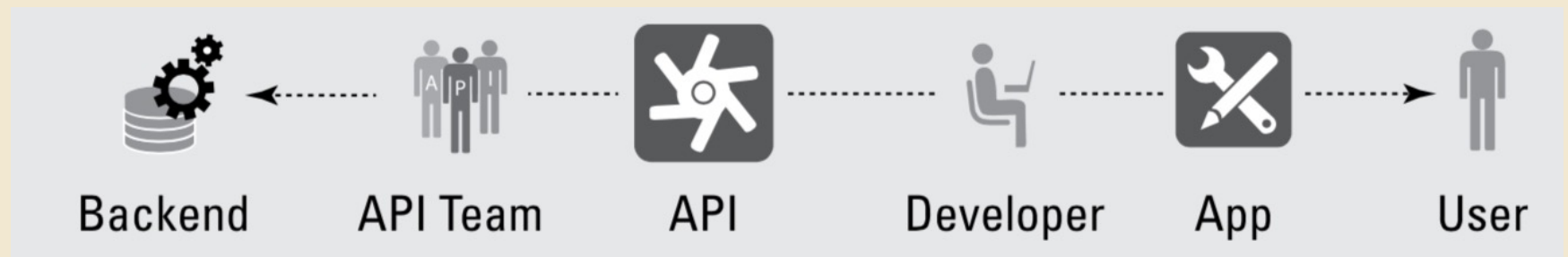
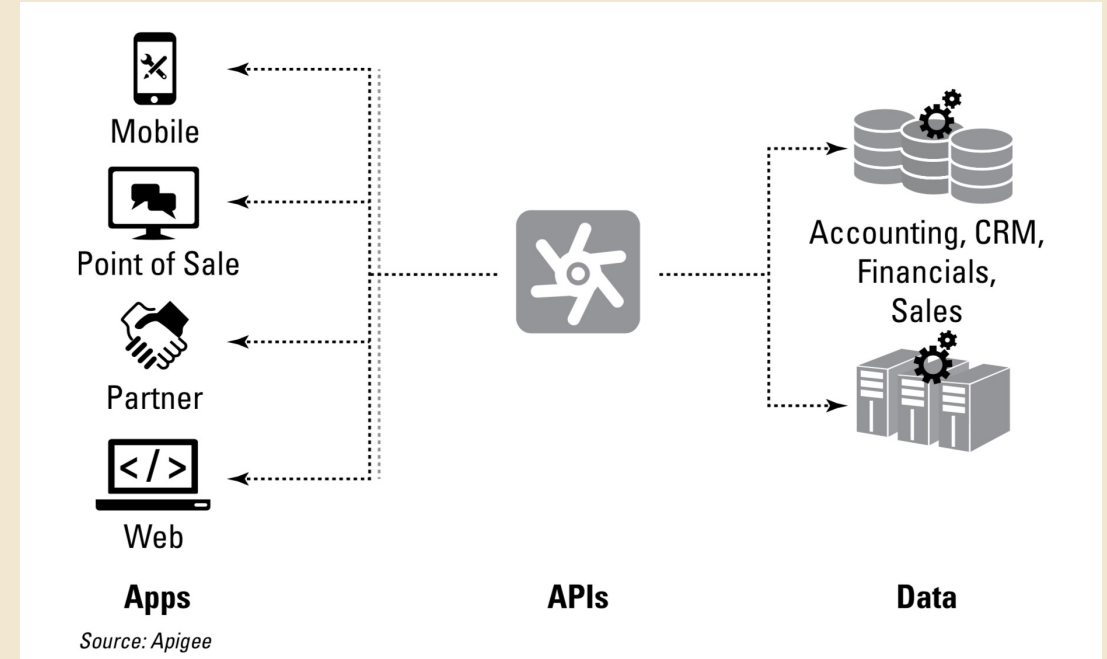
Image view

Text view

Buttons

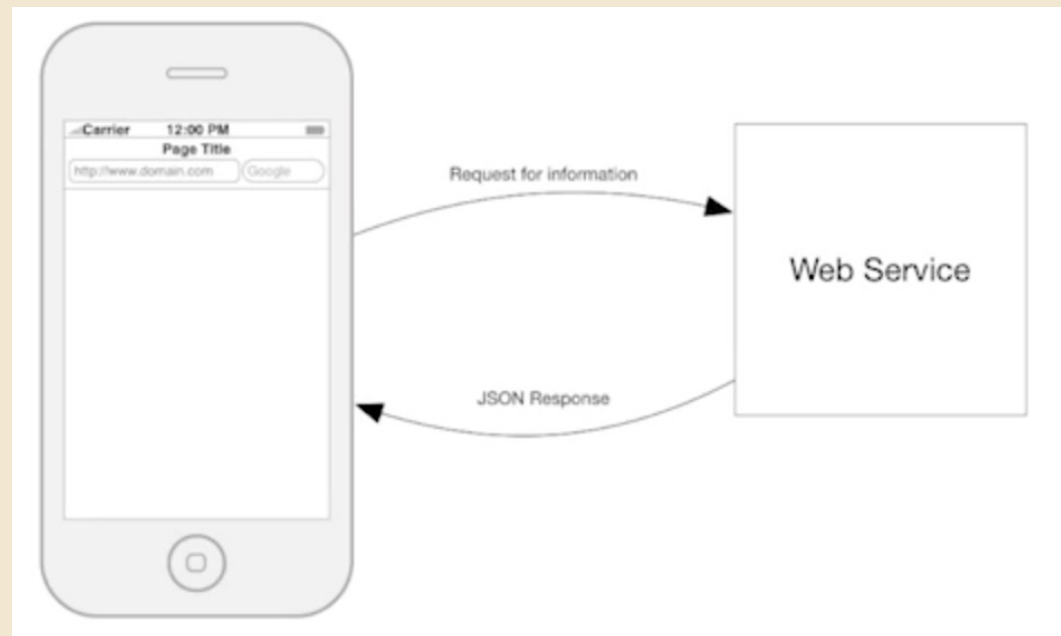
Connecting to The Web, JSON

- Understanding API and JSON
- Fetching JSON
- Parsing JSON
 - volley library



What is JSON?

- JSON
 - JavaScript Object Notation
- JSON 是一種有格式的文字表示
 - 有著某種語法的格式
 - 以文字為基礎，且易於讓人閱讀
- 雖然是JavaScript，但常使用於網際網路間資料傳輸
 - 與多語言皆有處理JSON的函式庫
- 用在許多網路服務的溝通
- 設計用於伺服器與瀏覽器間資料溝通
- JSON Object
 - Key-Value pairs
- JSON Array
 - 有順序的資料序列



JSON Quiz

- What is the following similar with JSON Object in Java?
 1. Dictionary
 2. HashMap
 3. HashSet
 4. ArrayList
- What is the following similar with JSON Array in Java?
 1. Array
 2. Set
 3. Map
 4. StringBuilder

Data Binding and Singleton

- Resource with data binding
- View with data binding
- Singleton pattern
 - In software engineering, the singleton pattern is **a software design pattern that restricts the instantiation of a class to one “single” instance.** <from Wiki>
- Repository
- Callback function

Database and Firebase

- Firebase introduction
 - Realtime database – Firestore
- Shared preferences and SQLite