ANDROID COURSE

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Université Internationale de Casablanca
UNIVERSITÉ RECONNUE PAR L'ÉTAT

22hrs

Chapter I
- Android Basics

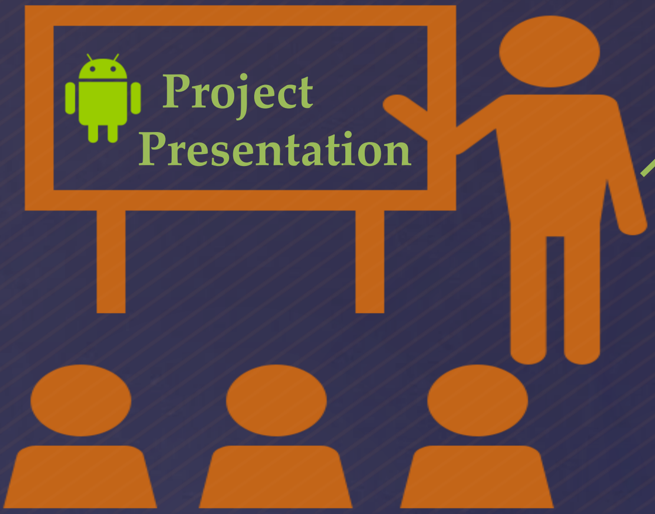
4 hours

Chapter II
- User Interface

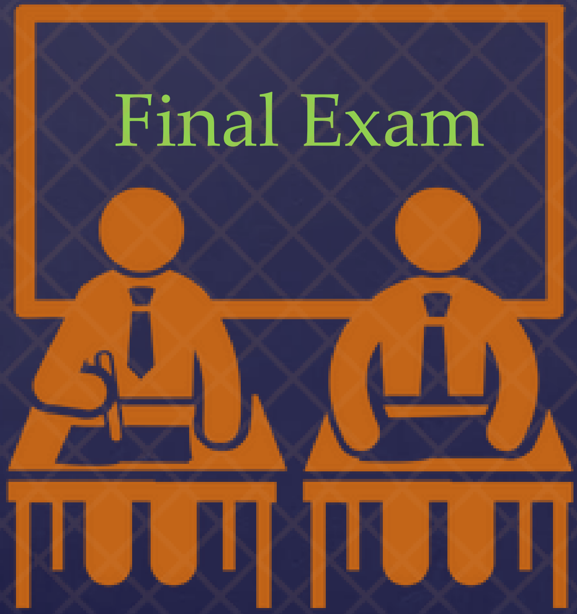
2 hours

Chapter III
- Advanced & Useful Concepts (Practical Work)

12 hours



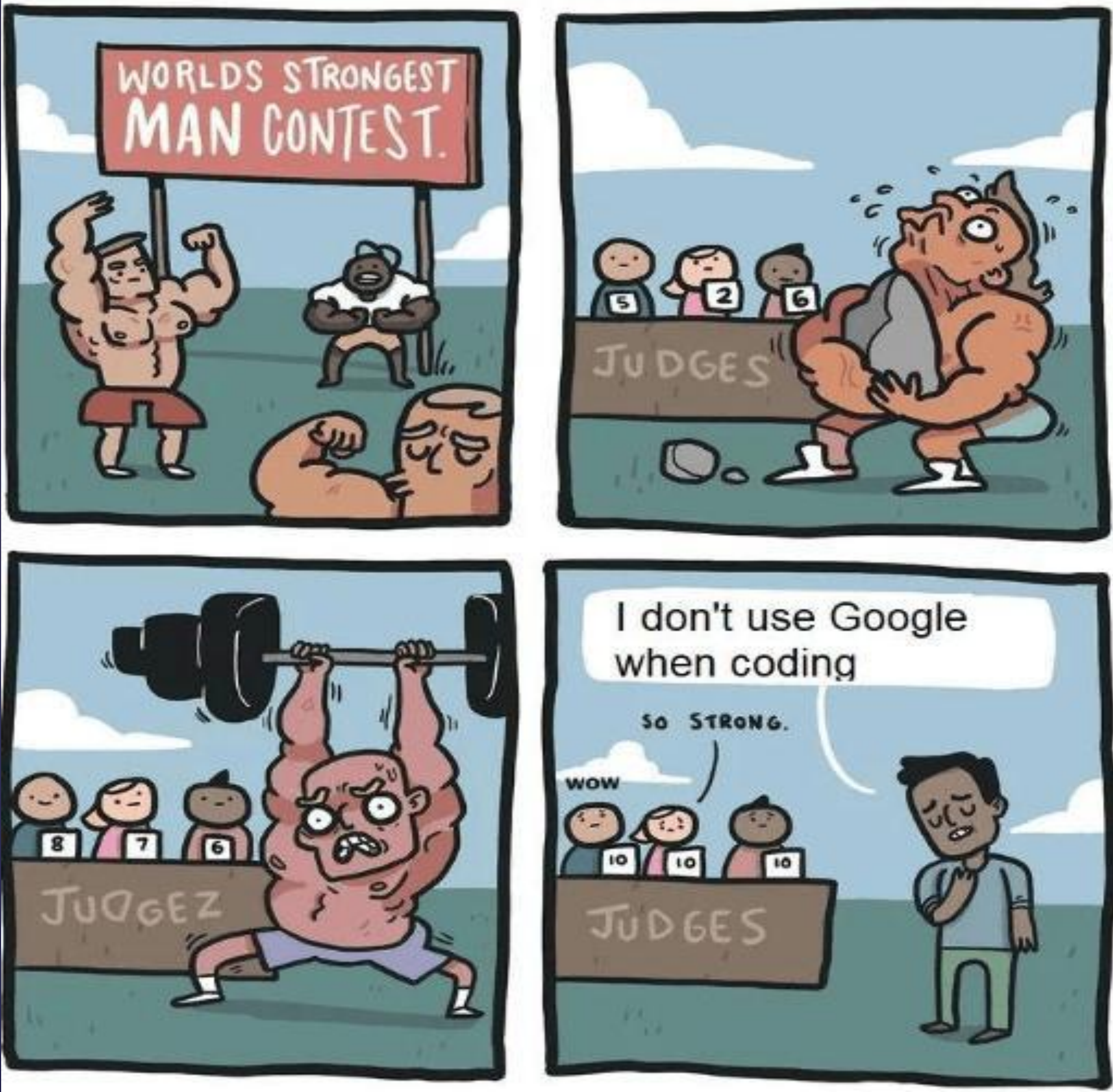
2 hours



2 hours

#Android

Facts


WORLDS STRONGEST MAN CONTEST.
JUDGES
5
2
6
JUDGEZ
8
7
6
I don't use Google when coding
SO STRONG.
WOW
10
10
10
JUDGES

Chapter I: Android Basics

1. Overview [What is android ? / why android? /features]
2. Environment Setup (IDEs):
3. Architecture
4. Application Components
5. Running my first application
6. Resources
7. Activities
8. Intents

Chapter II: User Interface

2 hours

1. UI layouts
2. UI Controls
3. Event handlings

Chapter III: Advanced & Useful Concepts: Practical Work

12 hours

1. Alert Dialogs
2. Auto Complete
3. Sending SMS
4. Sending Emails
5. Google maps (TP markers)
6. Progress Bars
7. Shared Preferences
8. SQLite / ORMs (Sugar)
9. Text to speech
10. Firebase(FirebaseAuthenticationManager + FirebaseDatabaseManager

INTRODUCTION TO ANDROID AND ANDROID STUDIO

{ Mr Adnane Ayman

What Will We Learn Today

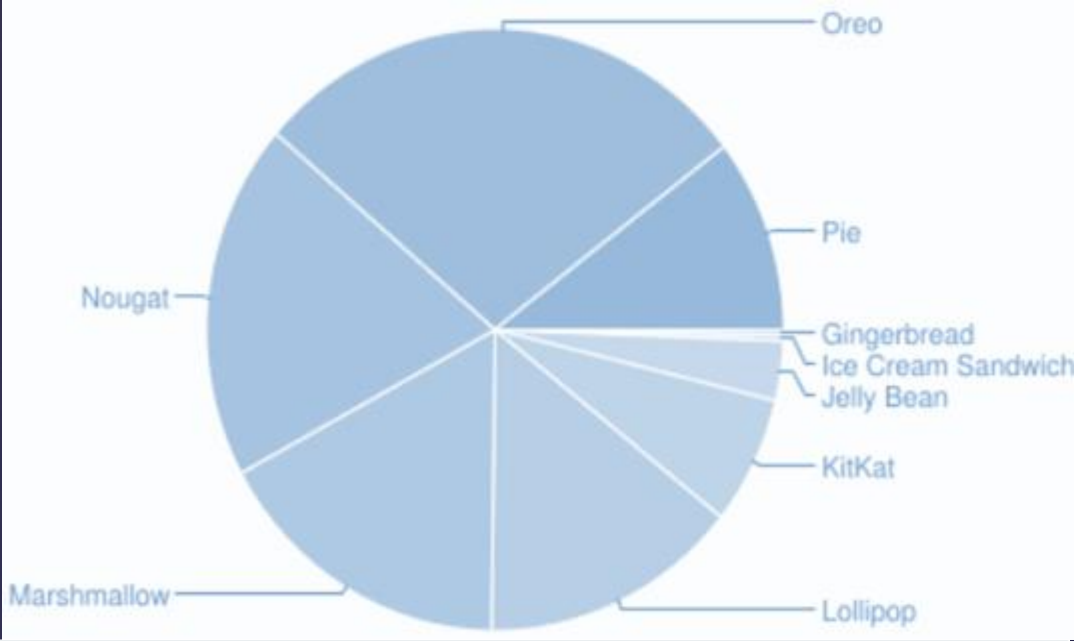
Android Basics:

- *Overview [What is android ? / why android? /features]*
- *Environment Setup (IDEs):*
- *Architecture*
- *Application Components*
- *Running my first application*
- *Resources*
- *Activities*
- *Intents*

What is android ?

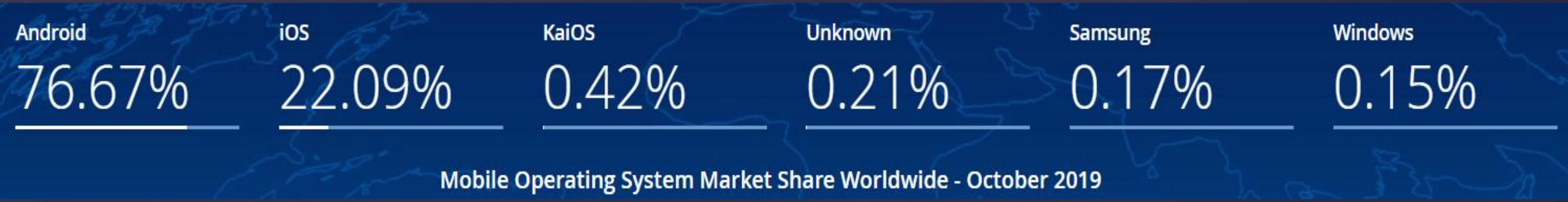
Android is the world's most popular and dominant mobile operating system. It's based on Linux and is open-source. It runs on a wide variety of hardware, including smartphones, smart watches, cars, televisions, digital cameras, game consoles and more. It was founded by Andy Rubin and three others in October 2003 and got acquired by Google in August 2005.

Distribution dashboard



Version	Codename		API	Distribution
2.3.3 - 2.3.7	Gingerbread	2011	10	0.3%
4.0.3 - 4.0.4	Ice Cream Sandwich		15	0.3%
4.1.x	Jelly Bean		16	1.2%
4.2.x			17	1.5%
4.3			18	0.5%
4.4	KitKat		19	6.9%
5.0	Lollipop		21	3.0%
5.1			22	11.5%
6.0	Marshmallow		23	16.9%
7.0	Nougat		24	11.4%
7.1			25	7.8%
8.0	Oreo		26	12.9%
8.1			27	15.4%
9	Pie	2018	28	10.4%

Worlwide Market Share

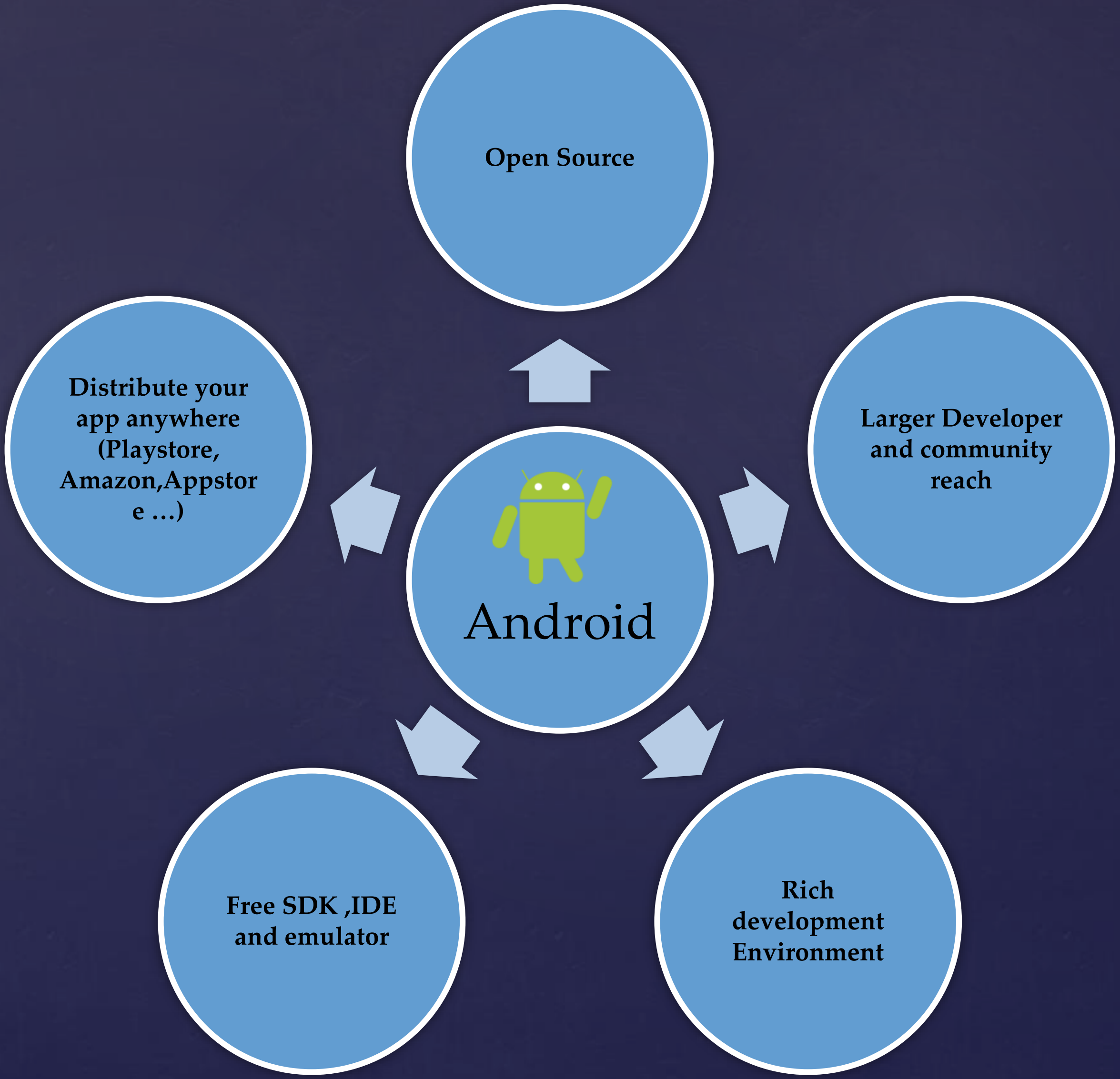


Android	iOS	KaiOS	Unknown	Samsung	Windows
76.67%	22.09%	0.42%	0.21%	0.17%	0.15%

Mobile Operating System Market Share Worldwide - October 2019

With Over 2.5 Billion monthly active users

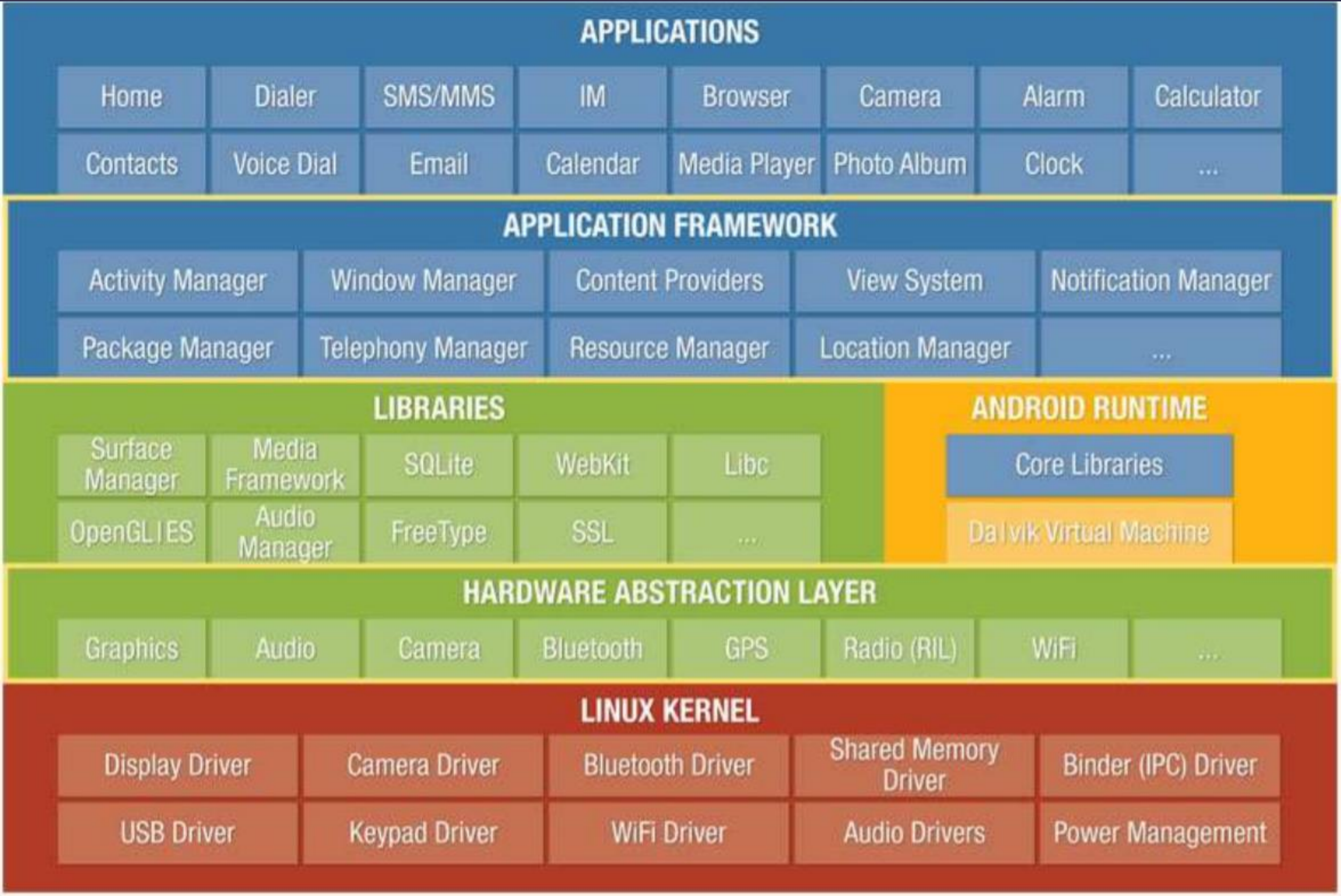
Why Android?


Open Source
Larger Developer and community reach
Rich development Environment
Free SDK ,IDE and emulator
Distribute your app anywhere (Playstore, Amazon,Appstore …)
Android

Features

Feature & Description	Feature & Description
Beautiful UI Android OS basic screen provides a beautiful and intuitive user interface.	**Multi-touch** Android has native support for multi-touch which was initially made available in handsets.
Connectivity GSM/EDGE, IDEN, CDMA, EV-DO, UMTS, Bluetooth, Wi-Fi, LTE, NFC and WiMAX.	**Multi-tasking** User can jump from one task to another and same time various application can run simultaneously.
Storage SQLite, a lightweight relational database, is used for data storage purposes.	**GCM** Google Cloud Messaging (GCM) is a service that lets developers send short message data to their users on Android devices, without needing a proprietary sync solution.
Media support MP3, MIDI, Ogg Vorbis, WAV, JPEG, PNG, GIF, SVG …	**Android Beam** A popular NFC-based technology that lets users instantly share, just by touching two NFC-enabled phones together.
Messaging SMS and MMS	
Web browser Based on the open-source WebKit layout engine, coupled with Chrome's V8 JavaScript engine supporting HTML5 and CSS3.	

Android Plateform Overview



Android Plateform Overview

Android is actually a system of the Linux family, for once without the GNU tools. The OS is based on:

- A Linux kernel (and its drivers)
- a virtual machine: Dalvik Virtual Machine
- applications (browser, contact management, telephony application ...)

[Dalvik] is the name of the open-source virtual machine used on Android systems. This virtual machine is running .dex files and is not compatible with a JVM of the type Java SE or even Java ME

What Do I Need To Build An Android App?

- Java Programming Language & XML
- Android SDK & SDK Tools
- Android Studio
- The desire to learn

Environment Setup (IDEs):

You can start the development of your Android application on one of the following operating systems:

- Microsoft Windows XP or later.
- Mac OS X 10.5.8 or later with Intel chip.
- Linux, including GNU C Library 2.7 or later.

Second, all the tools needed to develop Android apps are available for <u>free</u> and can be downloaded from the web. Below is a list of the software you will need before you start programming your Android application.

- Java JDK5 or later
- Android Studio

Environment Setup (IDEs):

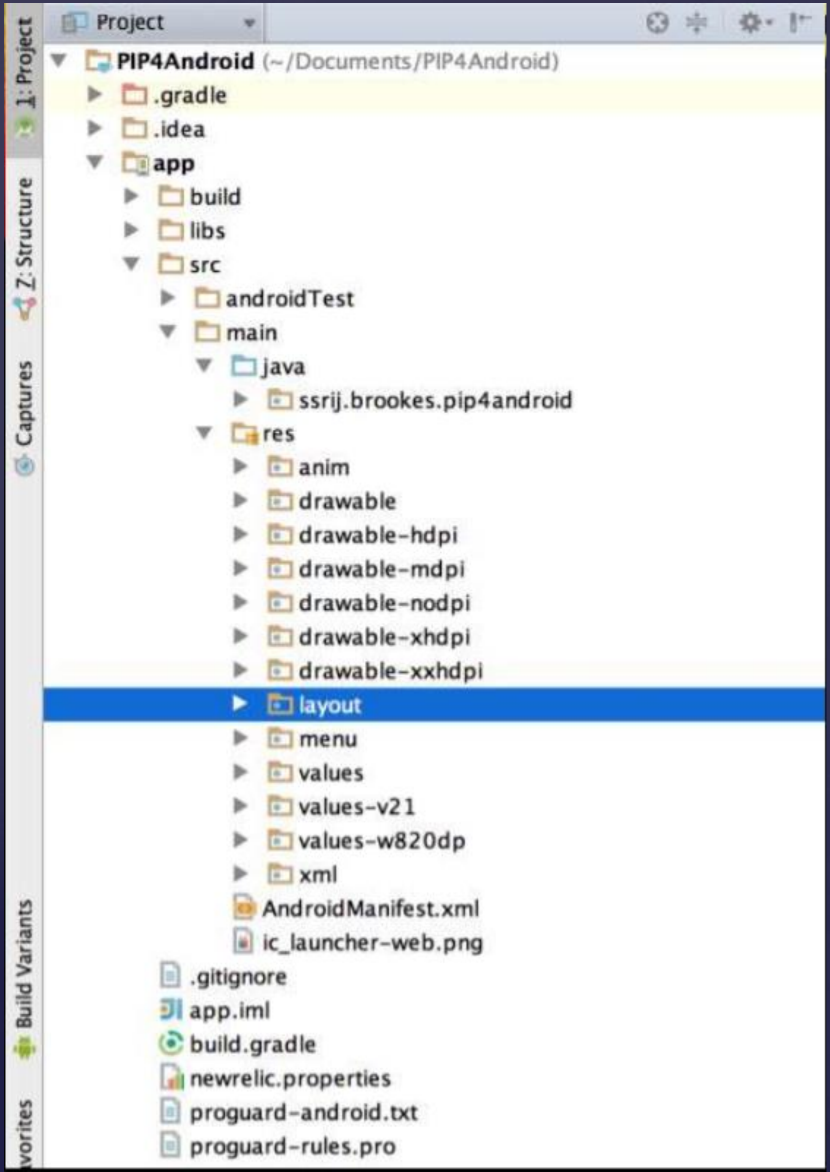
You can download the latest version of Java JDK from Oracle's Java site
– Java SE Downloads. You will find instructions for installing JDK in downloaded files, follow the given instructions to install and configure the setup. Finally set PATH and JAVA_HOME environment variables to refer to the directory that contains **java** and **javac**, typically java_install_dir/bin and java_install_dir respectively.

Android IDEs
There are so many sophisticated Technologies are available to develop android applications, the familiar technologies, which are predominantly using tools as follows

- Android Studio
- Eclipse IDE(Deprecated)

We are going to freeze to death if we don't do something
We only have one option left
@System32Comics
@Raph_Comic
Run Android Studio

Architecture



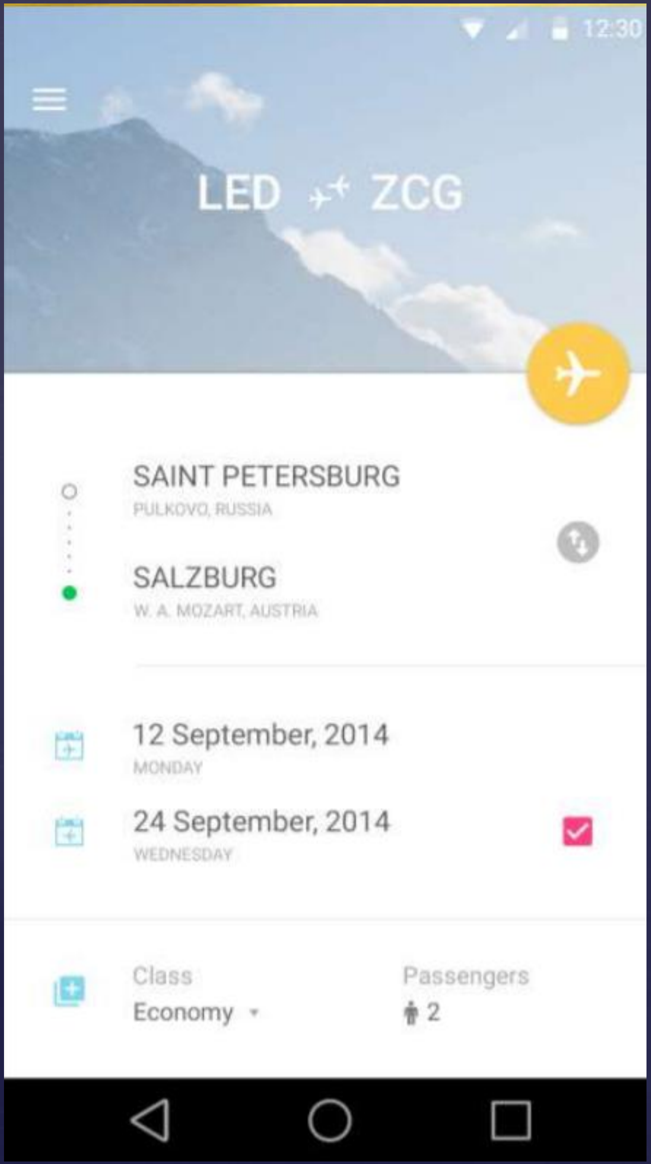
```
▼ PIP4Android (~/Documents/PIP4Android)
  ▶ .gradle
  ▶ .idea
  ▼ app
    ▶ build
    ▶ libs
    ▼ src
      ▶ androidTest
      ▼ main
        ▼ java
          ▶ ssrij.brookes.pip4android
        ▼ res
          ▶ anim
          ▶ drawable
          ▶ drawable-hdpi
          ▶ drawable-mdpi
          ▶ drawable-nodpi
          ▶ drawable-xhdpi
          ▶ drawable-xxhdpi
          ▶ layout
          ▶ menu
          ▶ values
          ▶ values-v21
          ▶ values-w820dp
          ▶ xml
        AndroidManifest.xml
        ic_launcher-web.png
    .gitignore
    app.iml
    build.gradle
    newrelic.properties
    proguard-android.txt
    proguard-rules.pro
```

- Java: Java class files containing app logic
- Res: Different resource files
- Anim: Animation resource files
- Drawable: Images
- Drawable-Xdpi: Images depending on screen density
- Layout: App layout files
- Menu: Layout menu files
- Values: Value files (strings, colors, arrays, etc)
- Values-vX: Value files depending on API level
- Values-Xdp: Value files depending on screen density
- XML: XML files
- AndroidManifest.xml: App metadata file
- build.gradle: Build related settings

Application Components

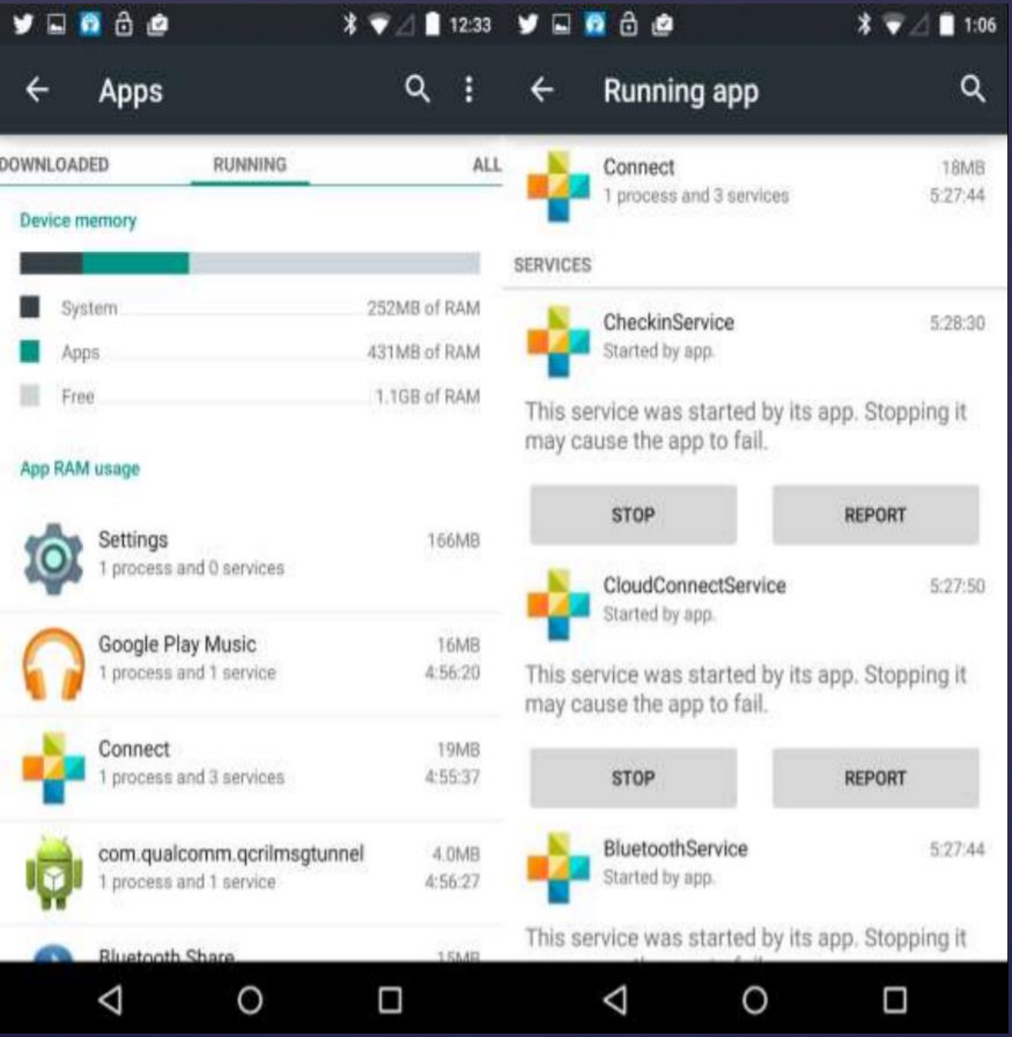
Application components are the essential building blocks of an Android application. These components are loosely coupled by the application manifest file *AndroidManifest.xml* that describes each component of the application and how they interact. There are following four main components that can be used within an Android application :

Activities



- They dictate the UI and handle the user interaction to the smart phone screen
- Every app has at least one activity
- Activities can be full-screen, floating or embedded inside another activity

Services



12:33

Apps

DOWNLOADED RUNNING ALL

Device memory

■	System	252MB of RAM
■	Apps	431MB of RAM
□	Free	1.1GB of RAM

App RAM usage

Settings 1 process and 0 services	166MB
Google Play Music 1 process and 1 service	16MB 4:56:20
Connect 1 process and 3 services	19MB 4:55:37
com.qualcomm.qcrilmsgtunnel 1 process and 1 service	4.0MB 4:56:27
Bluetooth Share	15MB

1:06

Running app

Connect
1 process and 3 services — 18MB 5:27:44

SERVICES

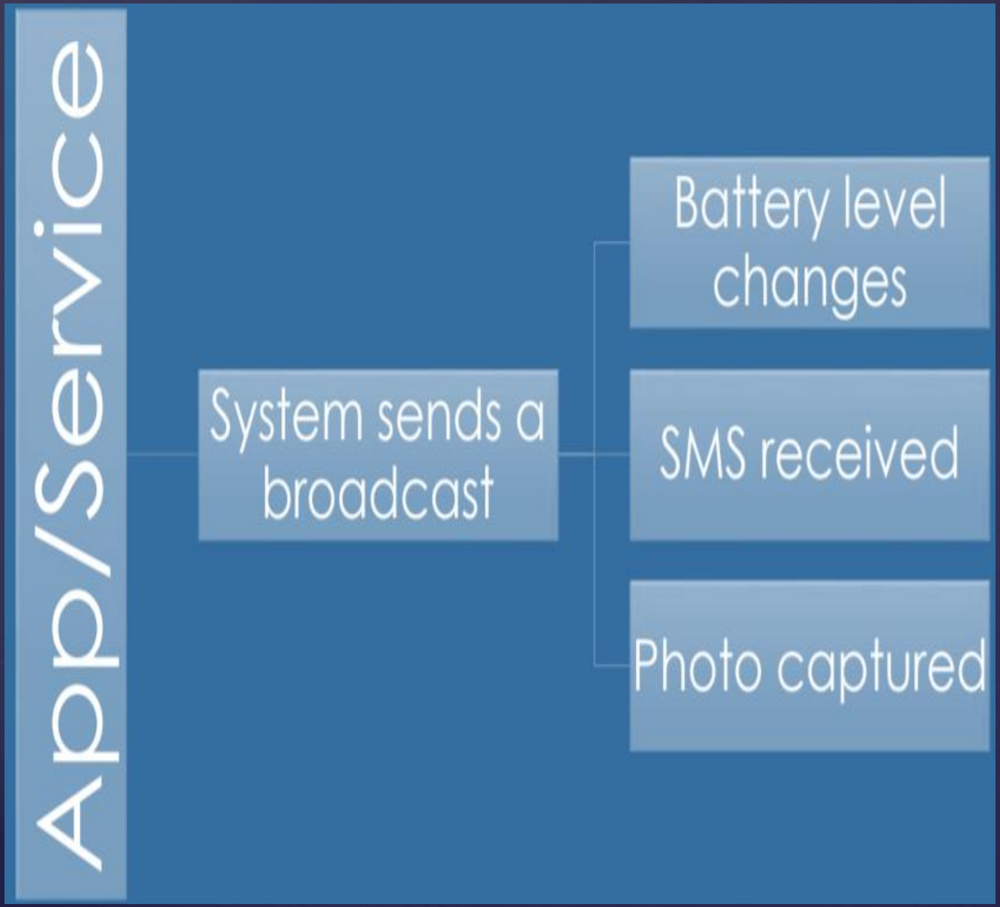
CheckinService — 5:28:30
Started by app.
This service was started by its app. Stopping it may cause the app to fail.
STOP REPORT

CloudConnectService — 5:27:50
Started by app.
This service was started by its app. Stopping it may cause the app to fail.
STOP REPORT

BluetoothService — 5:27:44
Started by app.
This service was started by its app. Stopping it

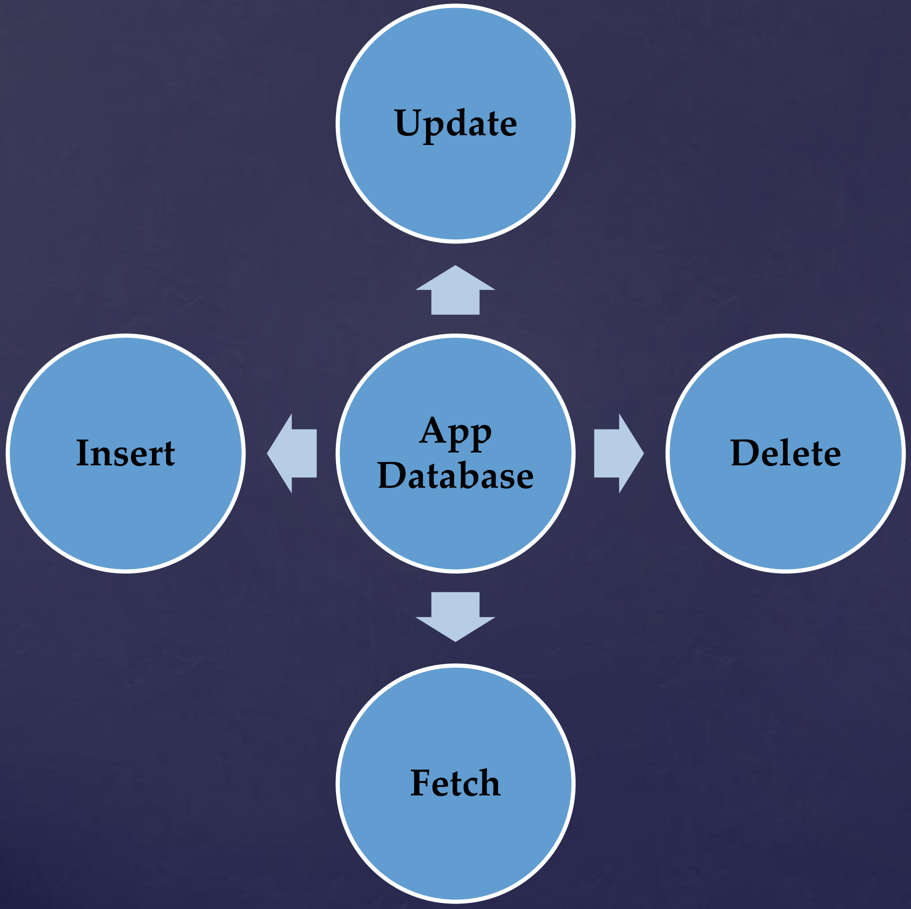
- A service is a long running operation in the background
- There are two types of services in Android – Bounded (which runs as long as components which bind to it run) and Unbounded (which runs indefinitely)
- Services run on the main thread of the application by default

BroadcastReceiver



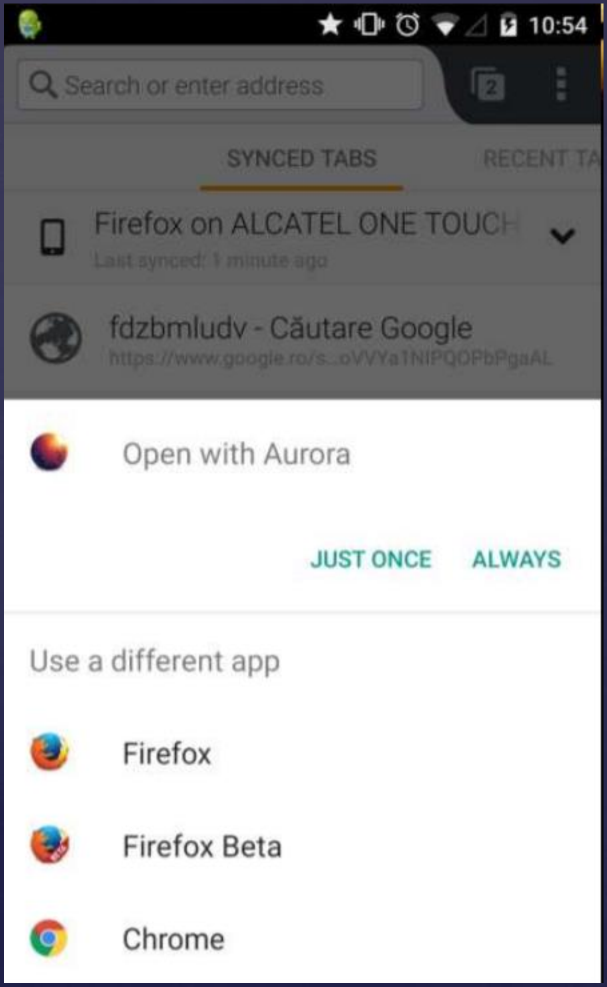
- A broadcast is a system or app event that can be "broadcasted" so other apps/services can listen for it
- Broadcasts are handled by a BroadcastReceiver, which is a component that allows you to listen for broadcasts
- A BroadcastReceiver can be implemented in AndroidManifest.xml, or dynamically by calling registerReceiver(), or both

Content Providers/Resolvers



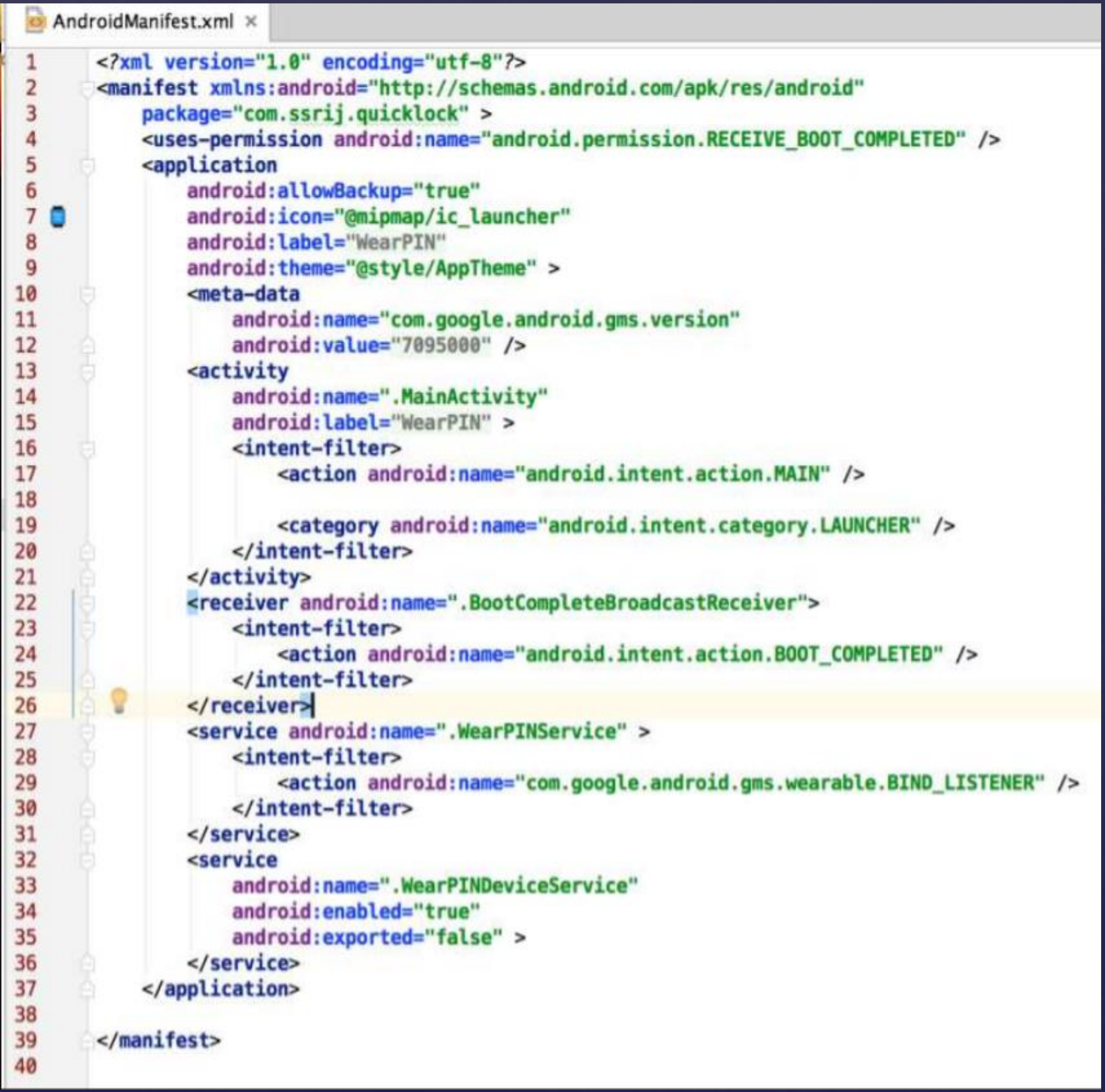
- A content provider allows you to store data in your app in a structured way, similar to a relational database like SQL, for the purpose of providing it to other apps. Example usage: Contacts app, SMS app, etc
- A content resolver allows you to get data from a content provider or manipulate its data (modify, delete, update, etc)
- You cannot request to read data from a content provider at runtime, it has to be declared in AndroidManifest.xml

Additional Components Intents


10:54
Search or enter address
SYNCED TABS
RECENT TA
Firefox on ALCATEL ONE TOUCH
Last synced: 1 minute ago
fdzbmludv - Căutare Google
https://www.google.ro/s...oVVYa1NIPQOPbPgaAL
Open with Aurora
JUST ONCE
ALWAYS
Use a different app
Firefox
Firefox Beta
Chrome

- An intent is an abstract description of an operation to be performed. Think of it as an "intention" to do something
- Intents can be used to start activities, services or send a broadcast
- Intents are of two types – Explicit (when you know what exactly you want to do), and Implicit (when you're not sure what you want to do)

AndroidManifest.XML

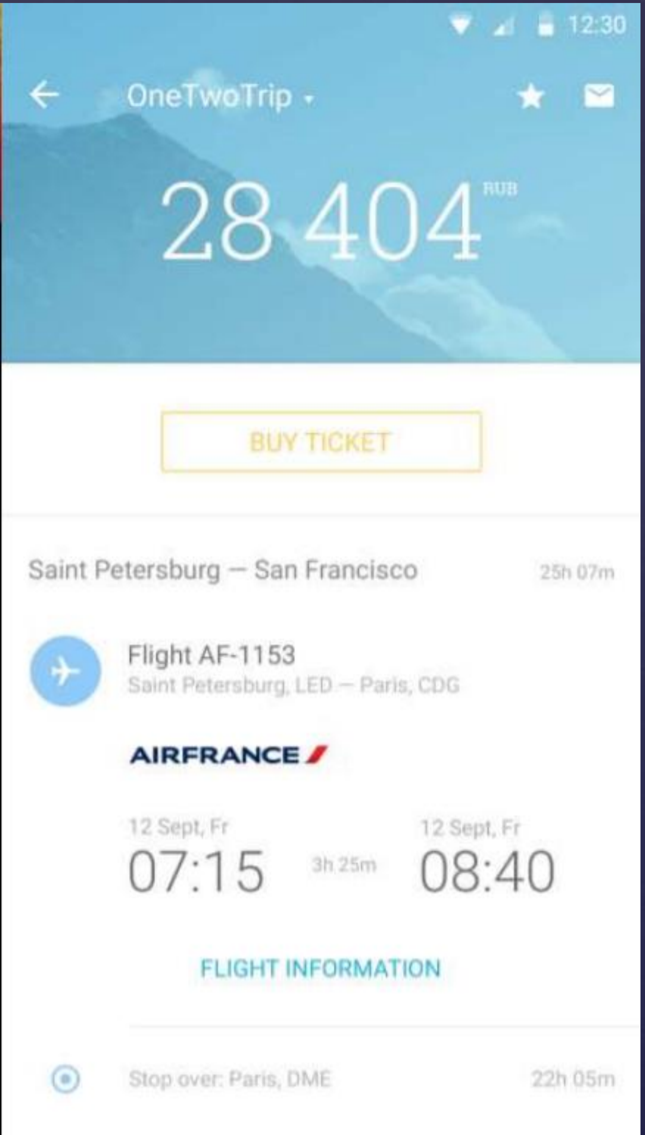


AndroidManifest.xml

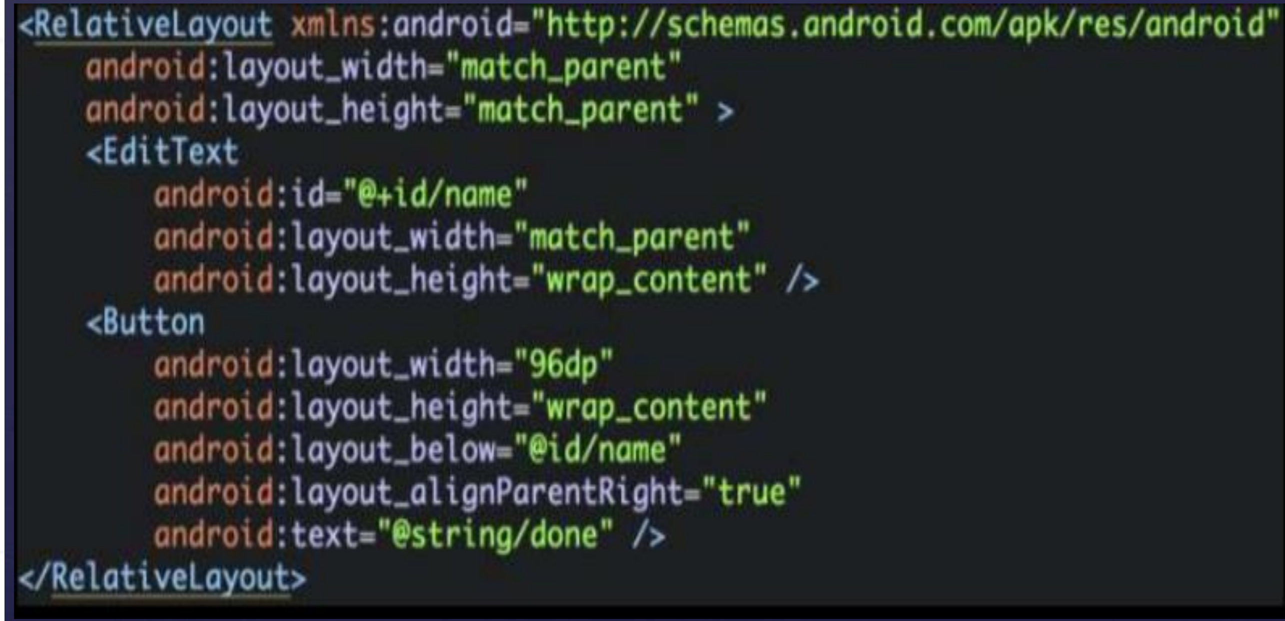
```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.ssrij.quicklock" >
    <uses-permission android:name="android.permission.RECEIVE_BOOT_COMPLETED" />
    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="WearPIN"
        android:theme="@style/AppTheme" >
        <meta-data
            android:name="com.google.android.gms.version"
            android:value="7095000" />
        <activity
            android:name=".MainActivity"
            android:label="WearPIN" >
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
        <receiver android:name=".BootCompleteBroadcastReceiver">
            <intent-filter>
                <action android:name="android.intent.action.BOOT_COMPLETED" />
            </intent-filter>
        </receiver>
        <service android:name=".WearPINService" >
            <intent-filter>
                <action android:name="com.google.android.gms.wearable.BIND_LISTENER" />
            </intent-filter>
        </service>
        <service
            android:name=".WearPINDeviceService"
            android:enabled="true"
            android:exported="false" >
        </service>
    </application>

</manifest>
```

Is the file which describes the fundamental characteristics of the app and defines each of its components.

Layouts

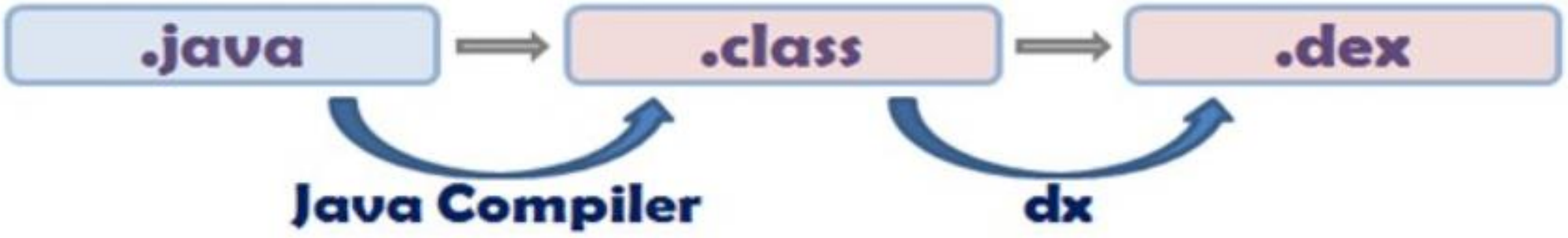


- A layout defines the visual structure for a user interface, such as the UI for an activity or app widget
- Layouts can be defined both in XML or programmatically using View and ViewGroup objects
- There are 5 different types of Layouts in Android: LinearLayout, RelativeLayout, FrameLayout, TableLayout and AbsoluteLayout



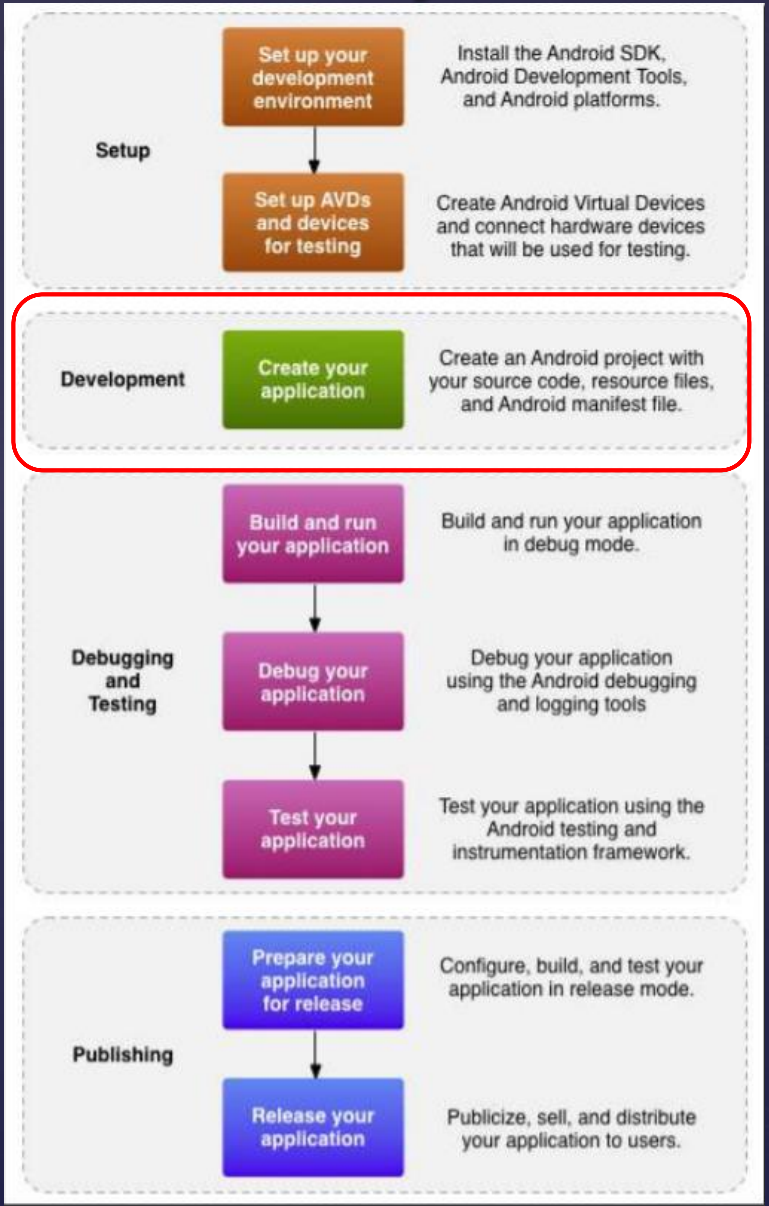
```
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    android:layout_width="match_parent"
    android:layout_height="match_parent" >
    <EditText
        android:id="@+id/name"
        android:layout_width="match_parent"
        android:layout_height="wrap_content" />
    <Button
        android:layout_width="96dp"
        android:layout_height="wrap_content"
        android:layout_below="@id/name"
        android:layout_alignParentRight="true"
        android:text="@string/done" />
</RelativeLayout>
```

Life cycle of Android application



- Android application starts its life as Java Source code.
- Compiled by Javac to byte code (.class files).
- Byte code is input to Android SDK.
- The dx tool available in the SDK converts Java bytcode to DVM bytcode at build time
- The dx format is a highly efficient and compact bytecode
- Android SDK converts it to .dex files, which run on Dalvik Vm.

Workflow


Setup
Set up your development environment
Install the Android SDK, Android Development Tools, and Android platforms.
Set up AVDs and devices for testing
Create Android Virtual Devices and connect hardware devices that will be used for testing.
Development
Create your application
Create an Android project with your source code, resource files, and Android manifest file.
Debugging and Testing
Build and run your application
Build and run your application in debug mode.
Debug your application
Debug your application using the Android debugging and logging tools
Test your application
Test your application using the Android testing and instrumentation framework.
Publishing
Prepare your application for release
Configure, build, and test your application in release mode.
Release your application
Publicize, sell, and distribute your application to users.

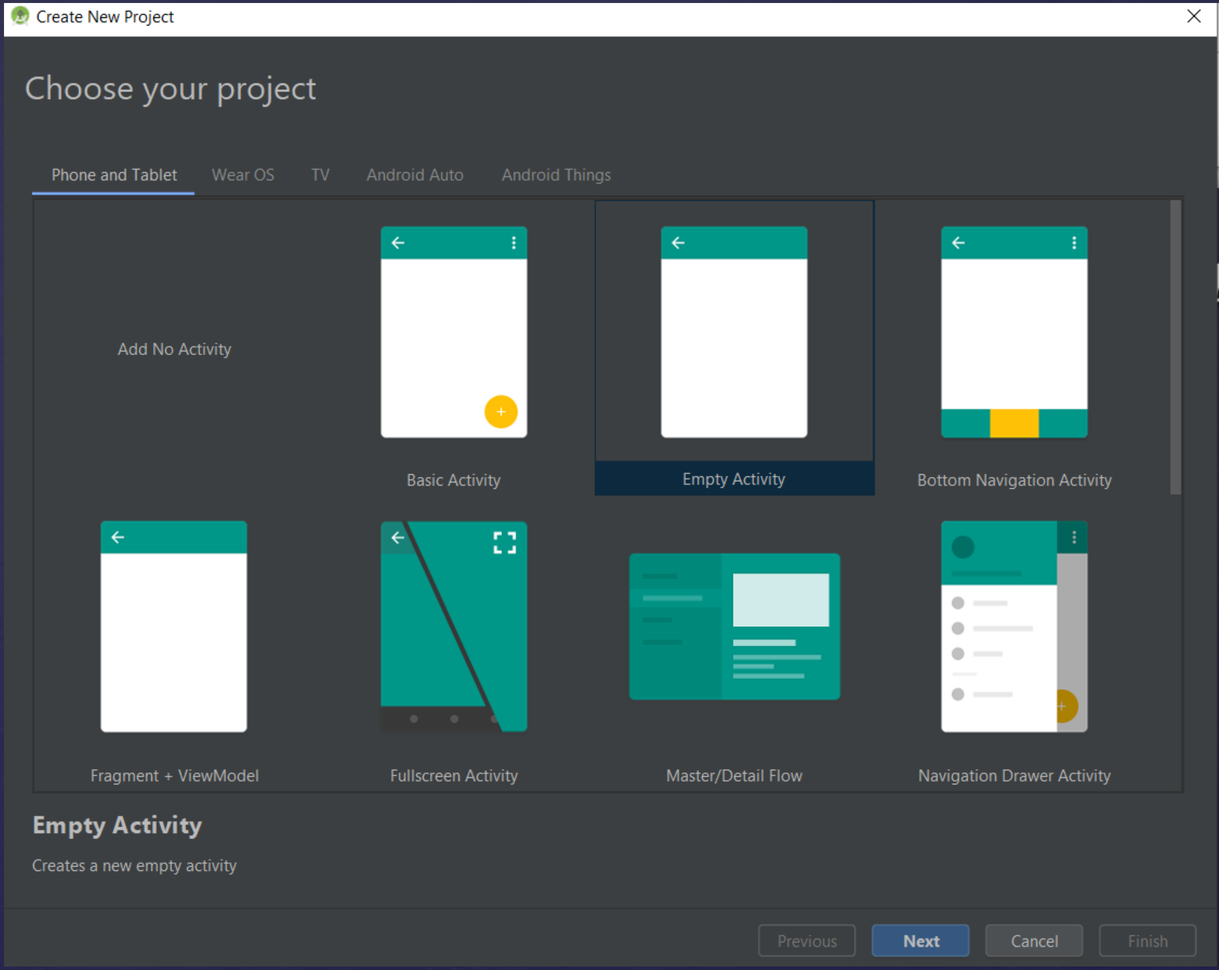
Running my first application

The first step is to create a simple Android Application using Android studio. When you click on Android studio icon, it will show screen as shown here:

The picture can't be displayed.

Running my first application

The next level of installation should contain selecting the activity to mobile, it specifies the default layout for Applications.


Create New Project

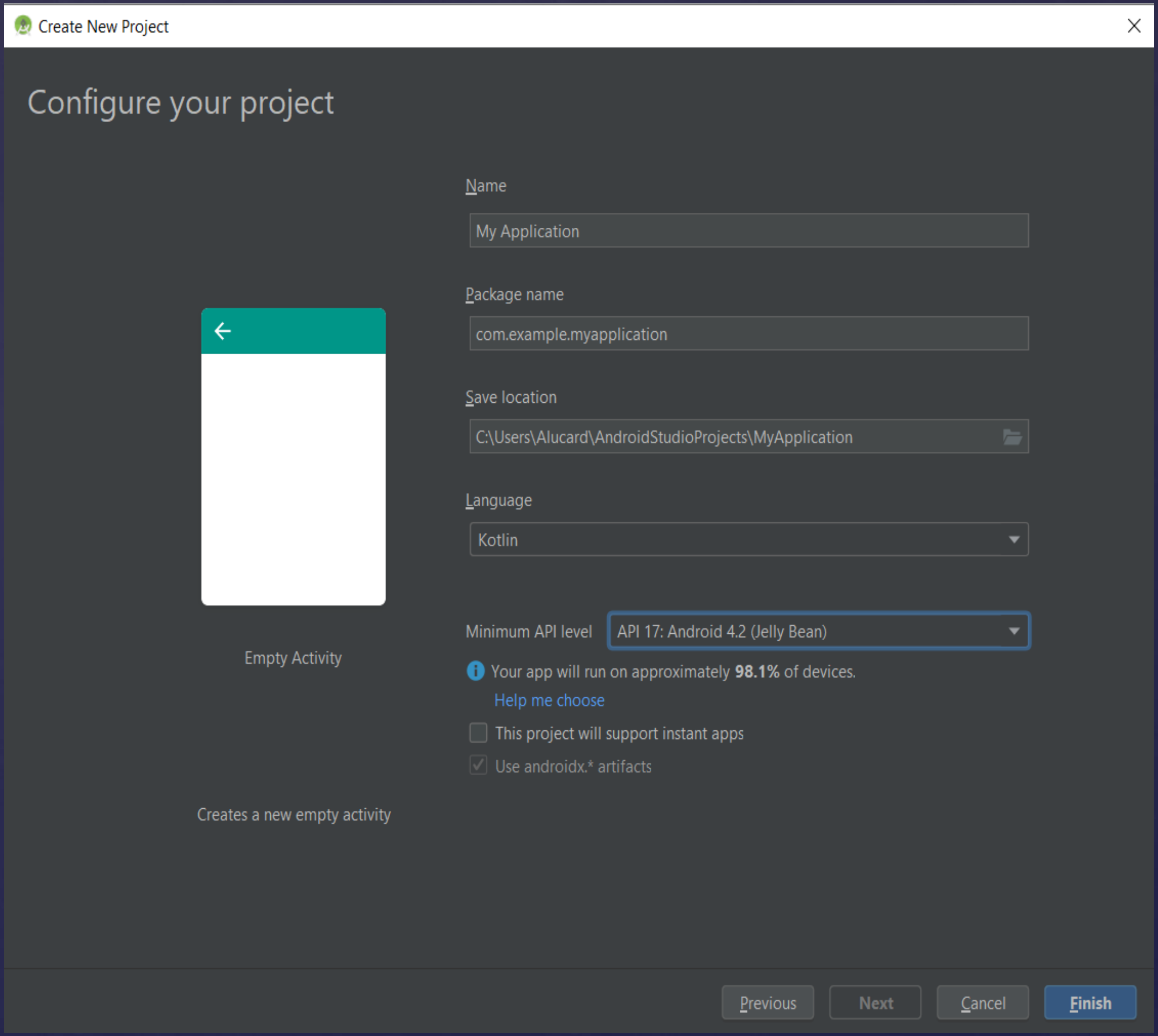
Choose your project

Empty Activity

Creates a new empty activity

Running my first application

A new installation frame should ask Application name, package information and location of the project. You need to specify Minimum SDK, and declare as API:17 Android 4.2(Jelly Bean)



Create New Project

Configure your project

Name: My Application

Package name: com.example.myapplication

Save location: C:\Users\Alucard\AndroidStudioProjects\MyApplication

Language: Kotlin

Minimum API level: API 17: Android 4.2 (Jelly Bean)

Your app will run on approximately **98.1%** of devices.

Help me choose

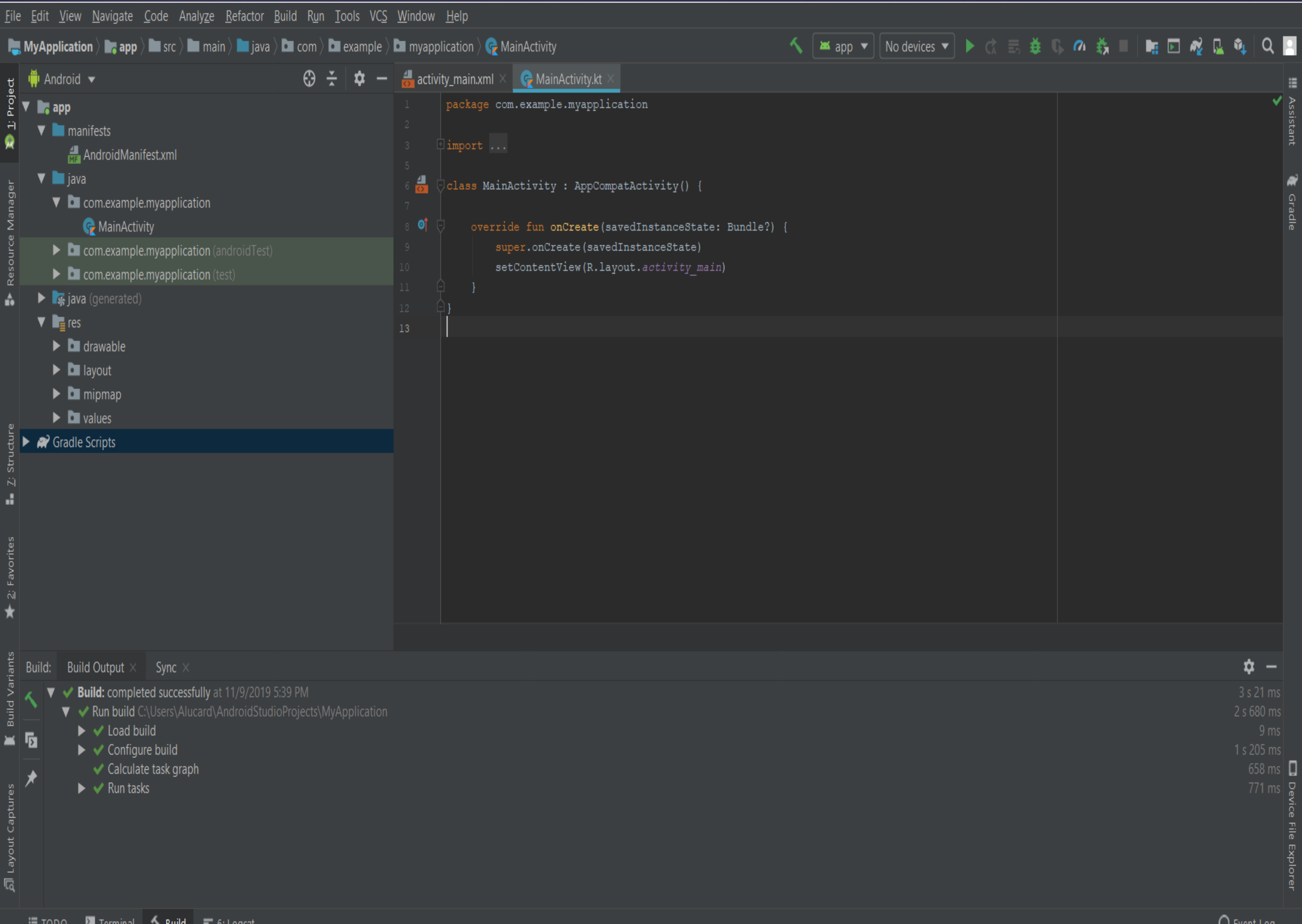
[ ] This project will support instant apps

[✓] Use androidx.* artifacts

Empty Activity

Creates a new empty activity

At the final stage it going to be open development tool to write the application code.

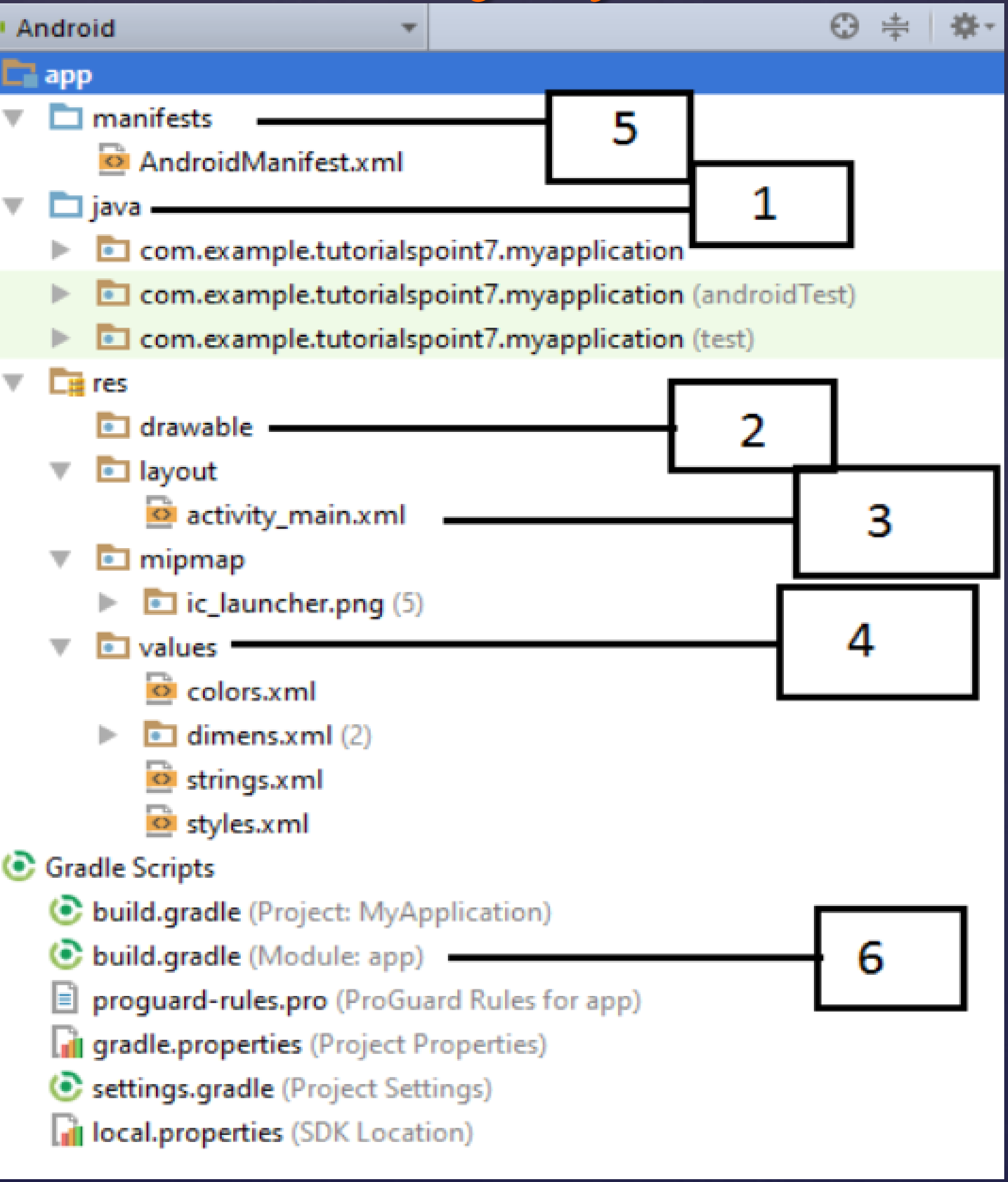


File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
MyApplication app src main java com example myapplication MainActivity
app
No devices
Android
activity_main.xml
MainActivity.kt
app
manifests
AndroidManifest.xml
java
com.example.myapplication
MainActivity
com.example.myapplication (androidTest)
com.example.myapplication (test)
java (generated)
res
drawable
layout
mipmap
values
Gradle Scripts

```
package com.example.myapplication

import ...

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

```
Build:  Build Output  Sync
Build: completed successfully at 11/9/2019 5:39 PM                          3 s 21 ms
  Run build C:\Users\Alucard\AndroidStudioProjects\MyApplication            2 s 680 ms
    Load build                                                              9 ms
    Configure build                                                         1 s 205 ms
    Calculate task graph                                                    658 ms
    Run tasks                                                               771 ms
```

Anatomy of Android Application

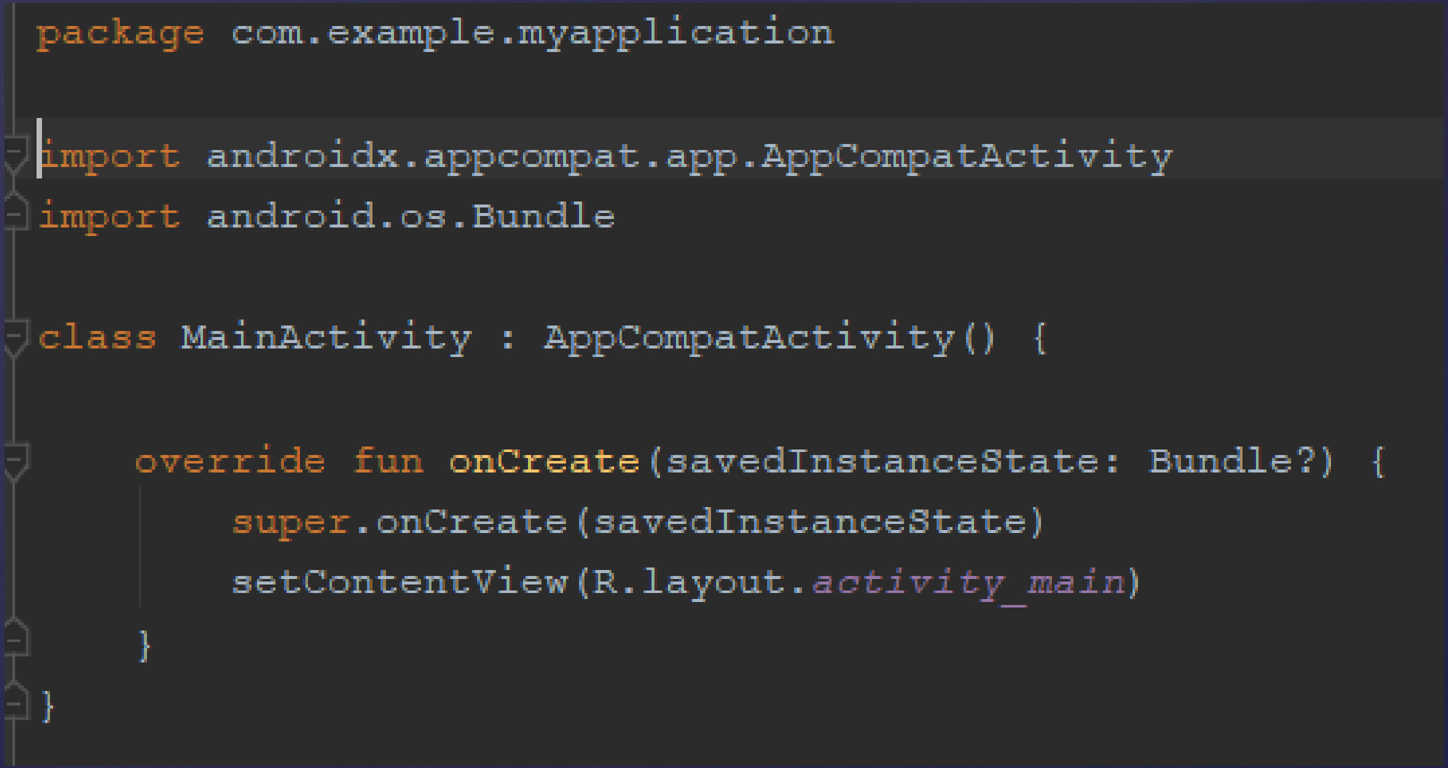


```
Android
app
  manifests
    AndroidManifest.xml
  java
    com.example.tutorialspoint7.myapplication
    com.example.tutorialspoint7.myapplication (androidTest)
    com.example.tutorialspoint7.myapplication (test)
  res
    drawable
    layout
      activity_main.xml
    mipmap
      ic_launcher.png (5)
    values
      colors.xml
      dimens.xml (2)
      strings.xml
      styles.xml
Gradle Scripts
  build.gradle (Project: MyApplication)
  build.gradle (Module: app)
  proguard-rules.pro (ProGuard Rules for app)
  gradle.properties (Project Properties)
  settings.gradle (Project Settings)
  local.properties (SDK Location)
```

1. **Java =>** Contains the **.java** source files for your project.
2. **res/drawable =>** A directory for drawable objects
3. **res/layout =>** A directory for files that define your app's UI
4. **res/values =>** A directory for other various XML files that contain a collection of strings and colours definitions…
5. **AndroidManifest.xml**
6. **Build.gradle =>** contains compileSdkVersion, buildToolsVersion, applicationId, minSdkVersion, targetSdkVersion, versionCode and versionName

The Main Activity File

The main activity code is a Java file **MainActivity.java**. This is the actual application file which ultimately gets converted to a Dalvik executable and runs your application. Following is the default code generated by the application wizard for *Hello World!* application

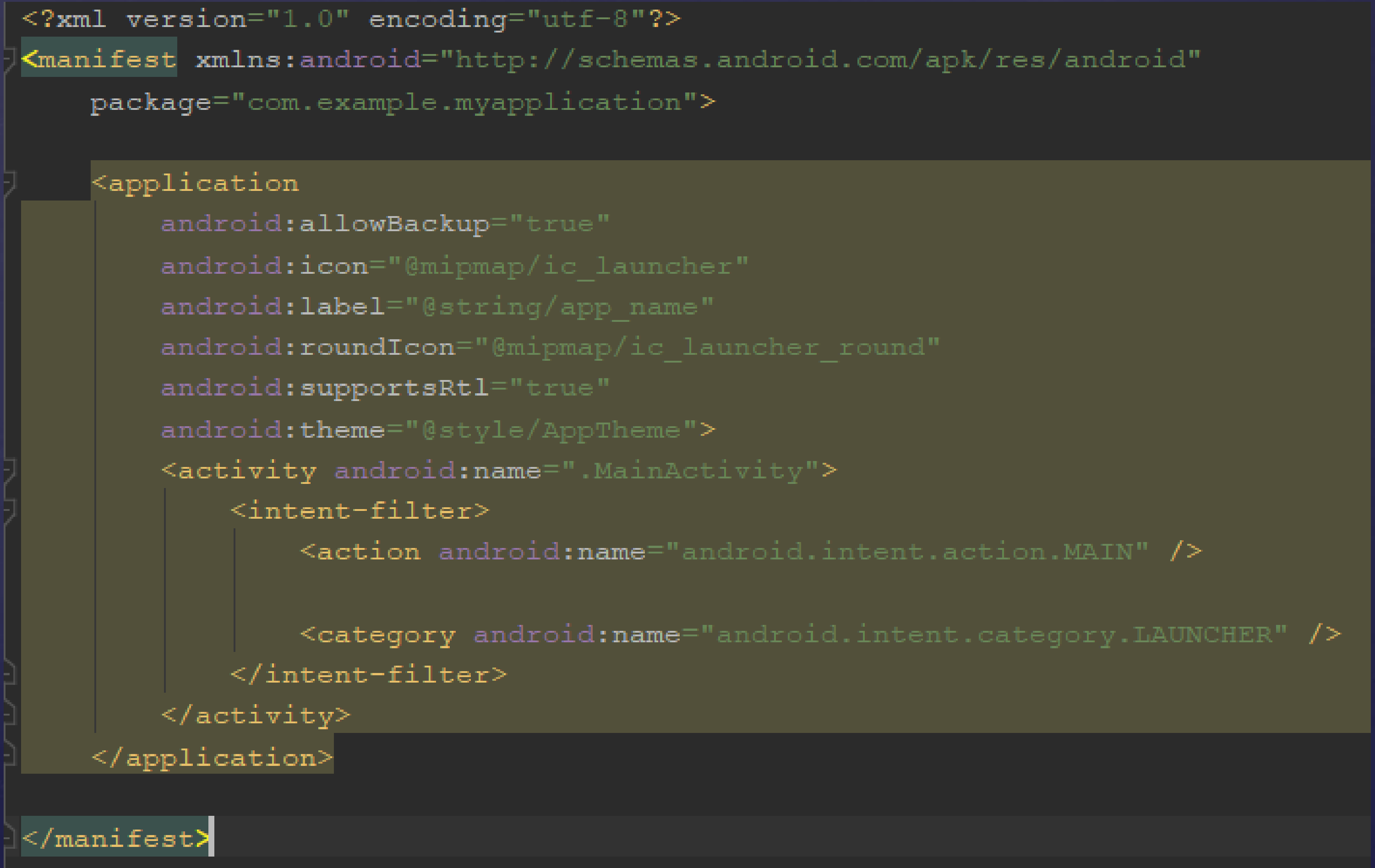


```
package com.example.myapplication

import androidx.appcompat.app.AppCompatActivity
import android.os.Bundle

class MainActivity : AppCompatActivity() {

    override fun onCreate(savedInstanceState: Bundle?) {
        super.onCreate(savedInstanceState)
        setContentView(R.layout.activity_main)
    }
}
```

Here, *R.layout.activity_main* refers to the *activity_main.xml* file located in the *res/layout* folder. The *onCreate()* method is one of many methods that are figured when an activity is loaded.

The Manifest File

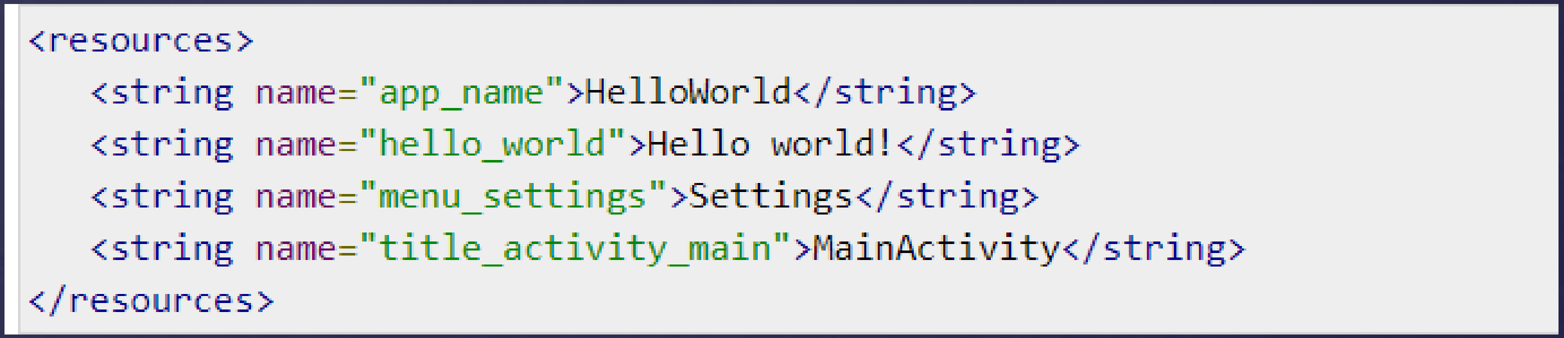
Following is the list of tags which you will use in your manifest file to specify different Android application components :
<activity>elements for activities; <service> elements for services ;<receiver> elements for broadcast receivers ;<provider> elements for content providers



```xml
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    package="com.example.myapplication">

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="@string/app_name"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" />

                <category android:name="android.intent.category.LAUNCHER" />
            </intent-filter>
        </activity>
    </application>

</manifest>
```

The Strings File

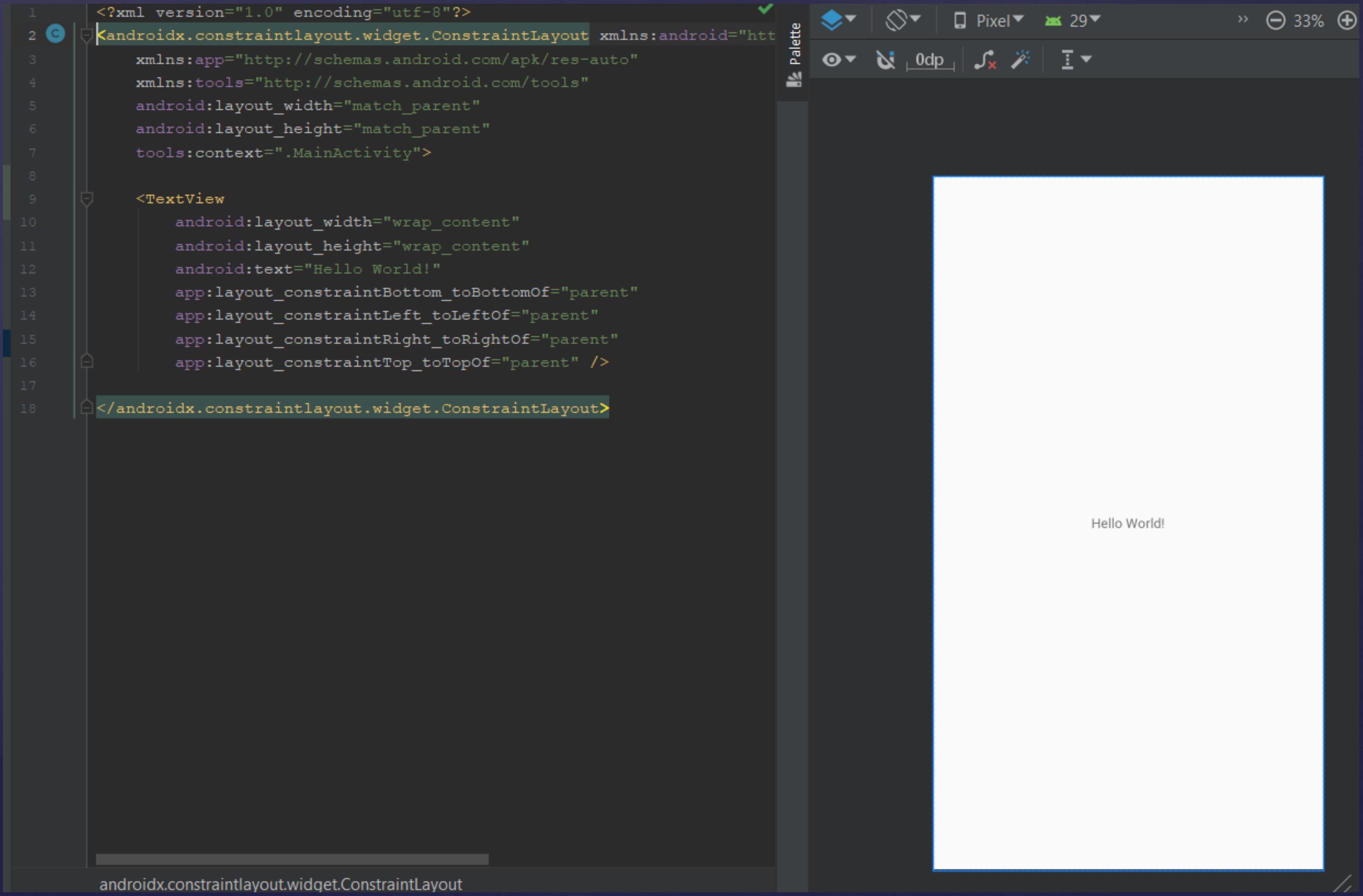
The **strings.xml** file is located in the *res/values* folder and it contains all the text that your application uses. For example, the names of buttons, labels, default text, and similar types of strings go into this file.



```
<resources>
   <string name="app_name">HelloWorld</string>
   <string name="hello_world">Hello world!</string>
   <string name="menu_settings">Settings</string>
   <string name="title_activity_main">MainActivity</string>
</resources>
```

The Layout File

The **activity_main.xml** is a layout file available in *res/layout* directory, that is referenced by your application when building its interface

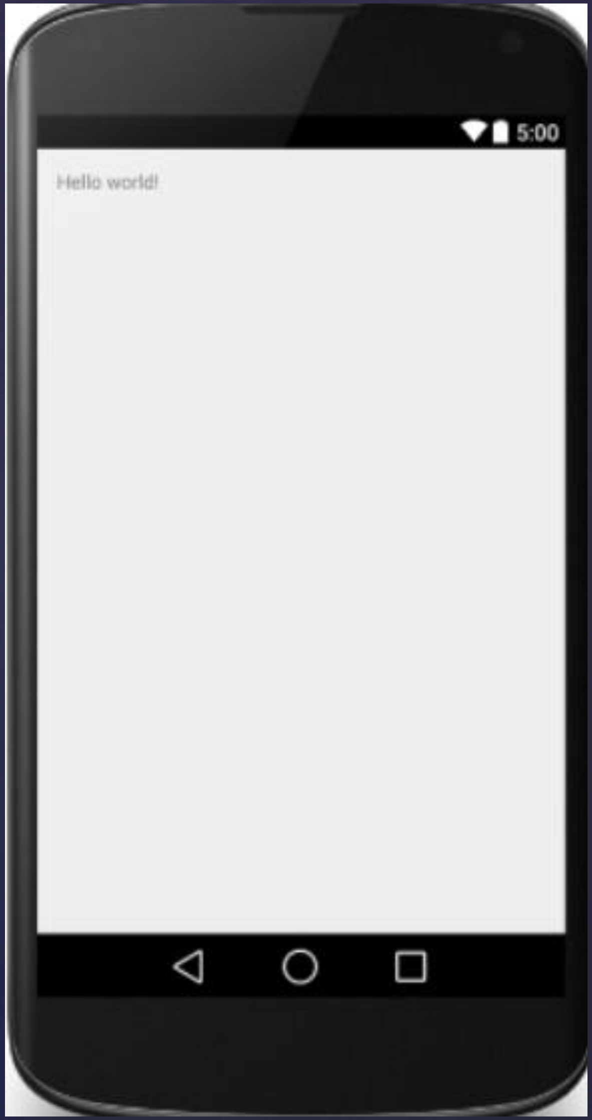


```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout xmlns:android="htt
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent"
    tools:context=".MainActivity">

    <TextView
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</androidx.constraintlayout.widget.ConstraintLayout>
```

androidx.constraintlayout.widget.ConstraintLayout

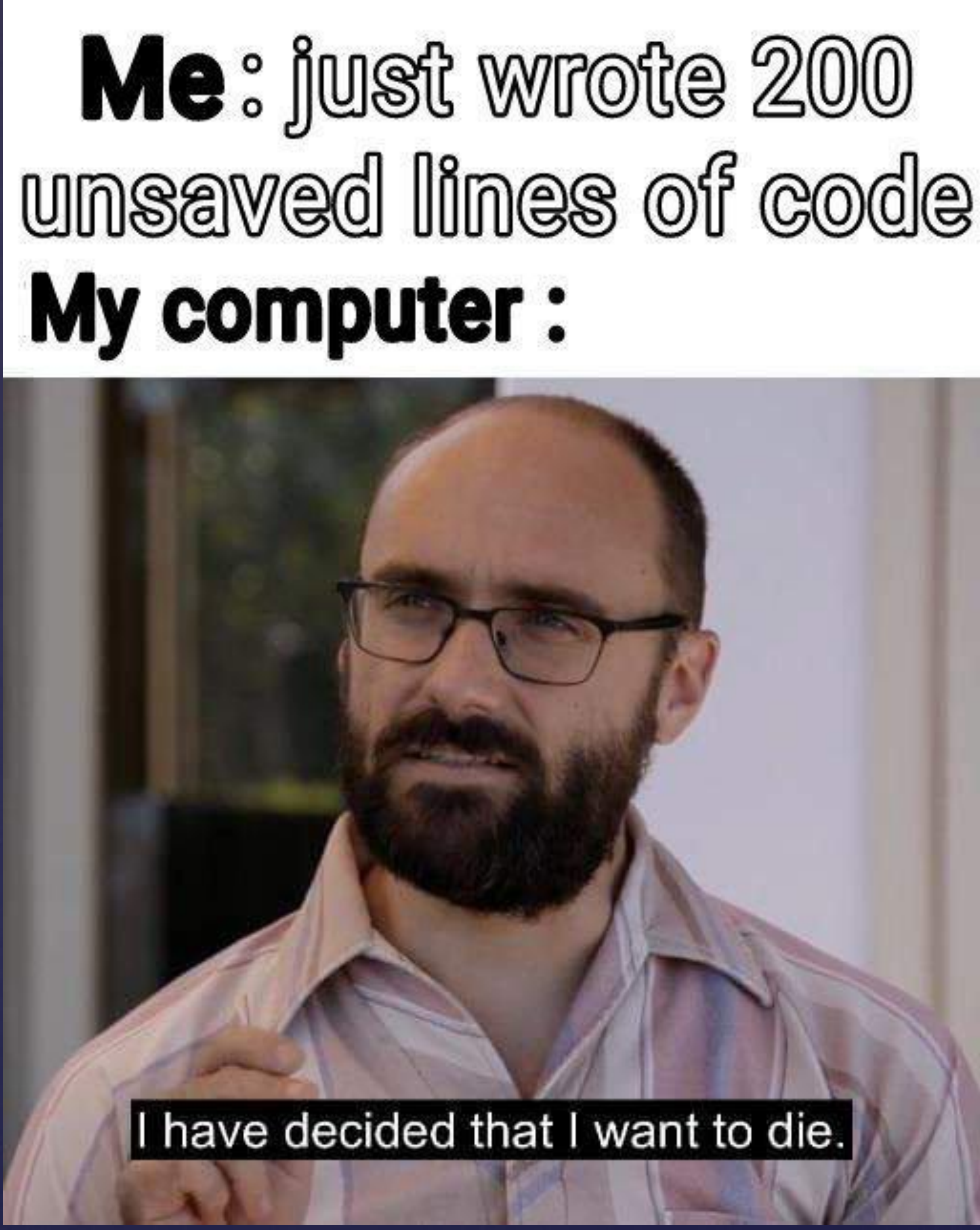
Running the application

Congratulations!!! you have developed your first Android Application



Hello world!

Friendly reminder


Me : just wrote 200 unsaved lines of code
My computer :
I have decided that I want to die.

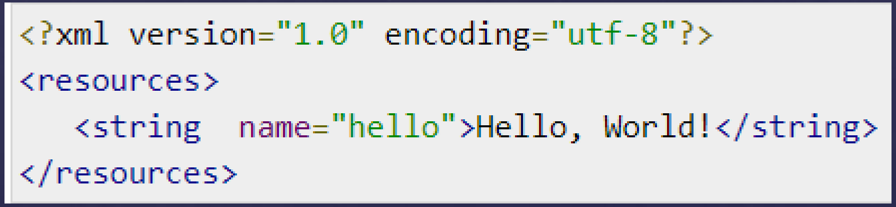
Accessing Resources in Code

When your Android application is compiled, a **R** class gets generated, which contains resource IDs for all the resources available in your **res/** directory. You can use R class to access that resource using sub-directory and resource name or directly resource ID

Example 1 :
To access *res/drawable/myimage.png* and set an ImageView you will use following code:

```
ImageView imageView = (ImageView) findViewById(R.id.myimageview);
imageView.setImageResource(R.drawable.myimage);
```

Example 2:
Consider next example where *res/values/strings.xml* has following definition



```
<?xml version="1.0" encoding="utf-8"?>
<resources>
   <string  name="hello">Hello, World!</string>
</resources>
```

Now you can set the text on a TextView object with ID msg using a resource ID as follows :

```
TextView msgTextView = (TextView) findViewById(R.id.msg);
msgTextView.setText(R.string.hello);
```

Accessing Resources in Code

Example 3 :
Consider the following resource XML *res/values/strings.xml* file that includes a color resource and a string resource:

```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
   <color name="opaque_red">#f00</color>
   <string name="hello">Hello!</string>
</resources>
```

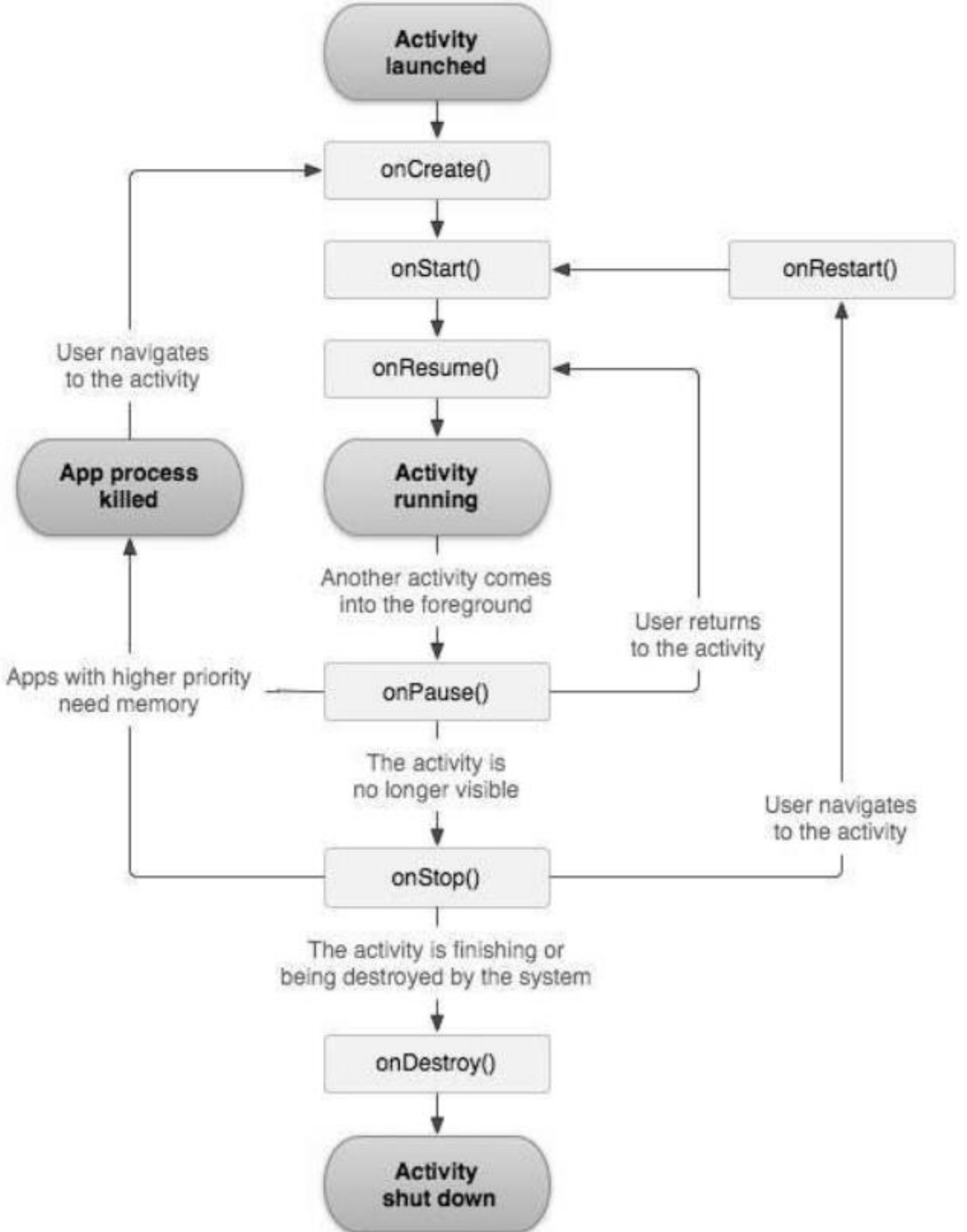
Now you can use these resources in the following layout file to set the text color and text string as follows :

```xml
<?xml version="1.0" encoding="utf-8"?>
<EditText xmlns:android="http://schemas.android.com/apk/res/android"
   android:layout_width="fill_parent"
   android:layout_height="fill_parent"
   android:textColor="@color/opaque_red"
   android:text="@string/hello" />
```

The Application life cycle

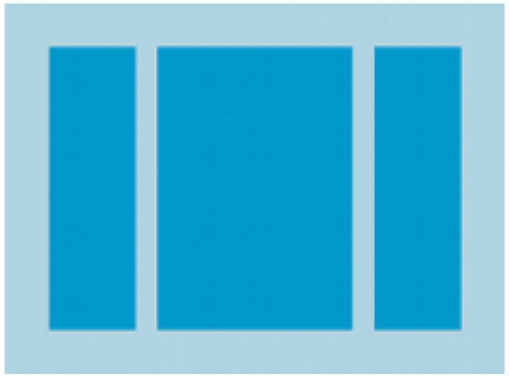
LIFECYCLE.txt

Click here


Activity launched
onCreate()
onStart()
onRestart()
User navigates to the activity
onResume()
App process killed
Activity running
Another activity comes into the foreground
User returns to the activity
Apps with higher priority need memory
onPause()
The activity is no longer visible
User navigates to the activity
onStop()
The activity is finishing or being destroyed by the system
onDestroy()
Activity shut down

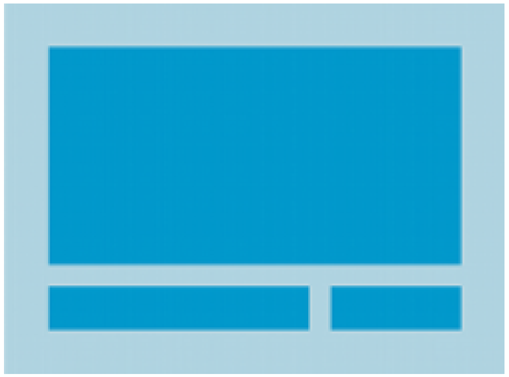
Layouts

Linear Layout



A layout that organizes its children into a single horizontal or vertical row. It creates a scrollbar if the length of the window exceeds the length of the screen.

Relative Layout



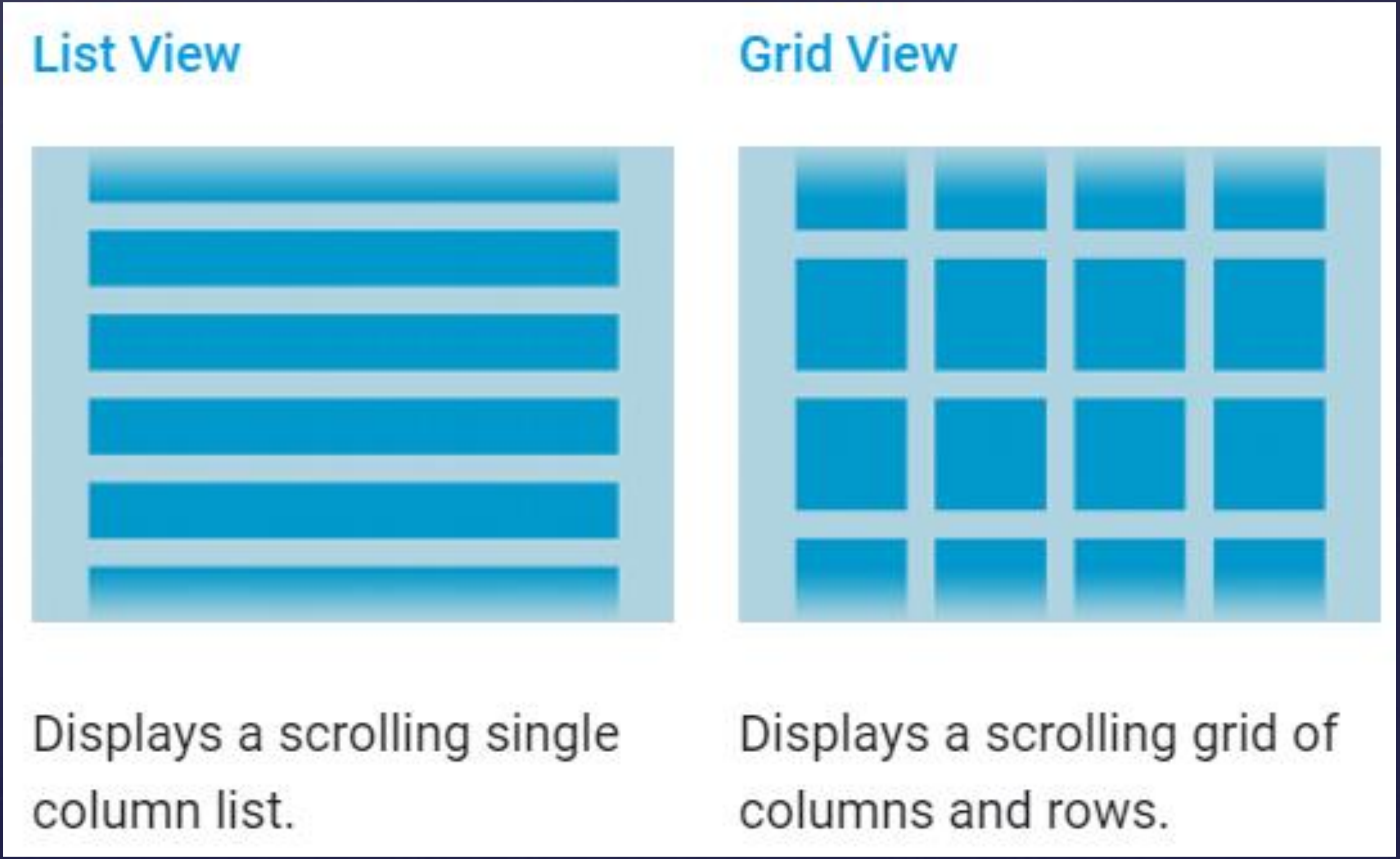
Enables you to specify the location of child objects relative to each other (child A to the left of child B) or to the parent (aligned to the top of the parent).

Web View

Displays web pages.

Layouts

- When the content for your layout is dynamic or not pre-determined, you can use a layout that subclasses AdapterView to populate the layout with views at runtime.

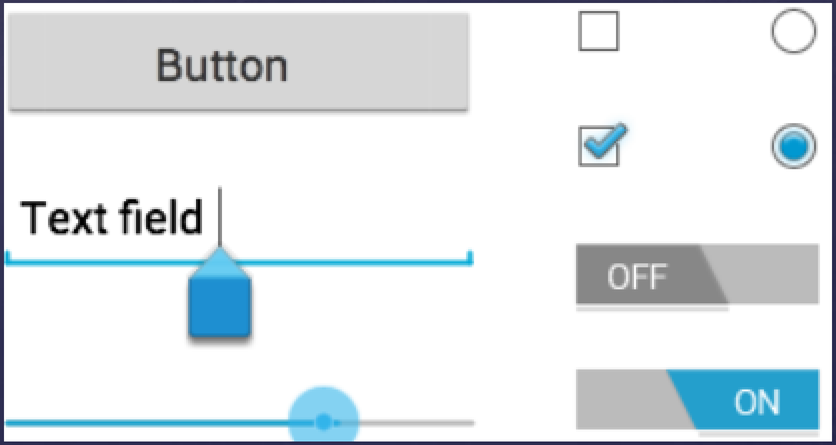


Displays a scrolling single column list.

Displays a scrolling grid of columns and rows.

UI Controls

- Input controls are the interactive components in your app's user interface. Android provides a wide variety of controls you can use in your UI, such as buttons, text fields, seek bars, check box, zoom buttons, toggle buttons, and many more.



test.txt

UI Controls

- Input controls are the interactive components in your app's user interface. Android provides a wide variety of controls you can use in your UI, such as buttons, text fields, seek bars, check box, zoom buttons, toggle buttons, and many more.

Example 1: Button with id = myButton

- Step 1:

Public class MainActivity extends AppCompatActivity implements View.OnClickListener

- Step 2:

Private Button button;

(inside on create)=>

button = (Button) findViewById(R.id.myButton);

button.setOnClickListener(this);

UI Controls

Example 1: Button with id = myButton

- Step 3:

```
@override
Public void onClick(View view) {
if(view == myButton){
//traitement+ toast
Toast.makeText(getApplicationContext(),“click!!",Toast.LENGTH_SHORT
).show();
}
}
```

UI Controls

Example 2: Button style

https://angrytools.com/android/button/

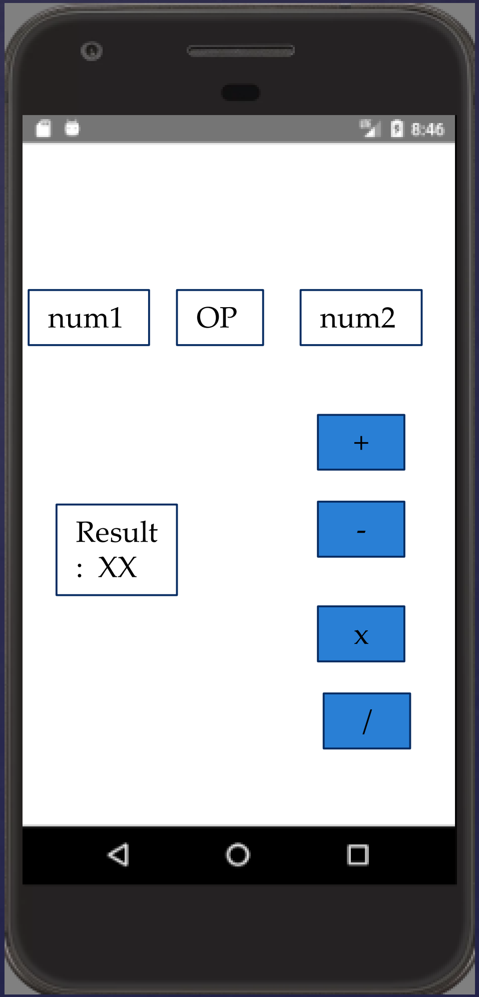
- Step 1: paste the xml generated code in layout.xml
- Step 2: paste the buttonShape.xml generated code in the drawable folder

Example 3 : changing case of textview

TP ; help (getText,setText , toLowerCase, toUpperCase)

UI Controls

Example 4 : Basic calculator



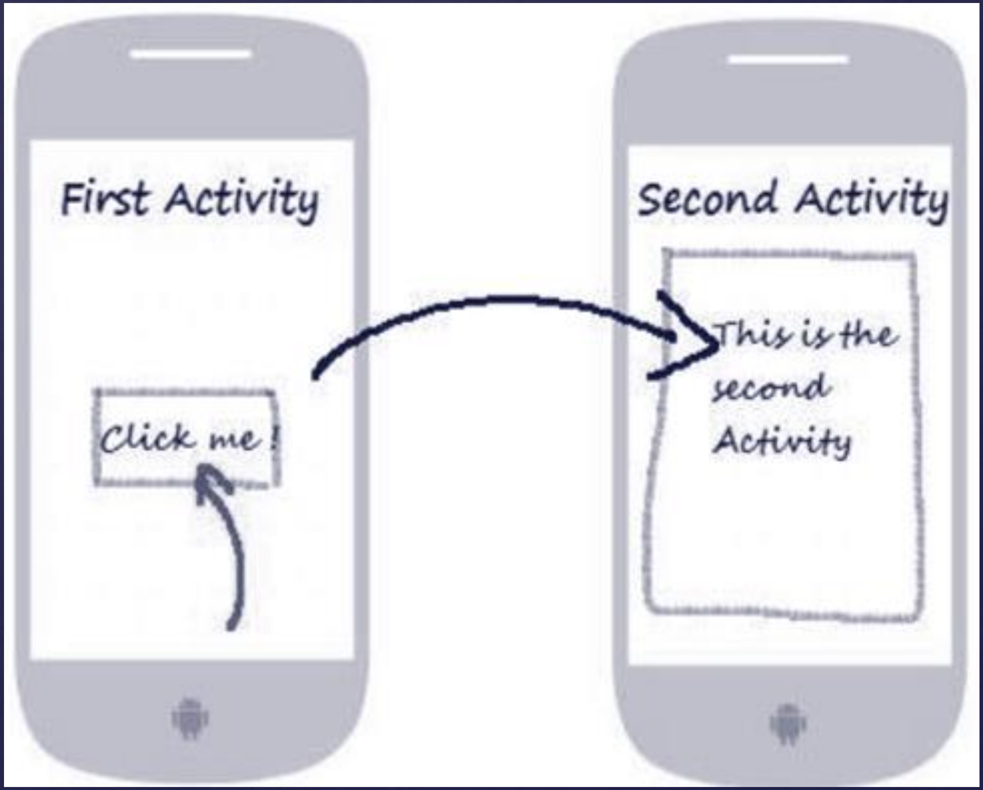
Intents

An Android **Intent** is an abstract description of an operation to be performed.

Example 1 :

```
// Explicit Intent by specifying its class name
Intent i = new Intent(FirstActivity.this, SecondActivity.class);
 // Starts TargetActivity
startActivity(i);
```

These intents (explicit) designate the target component by its name and they are typically used for application-internal messages - such as an activity starting a subordinate service or launching a sister activity.



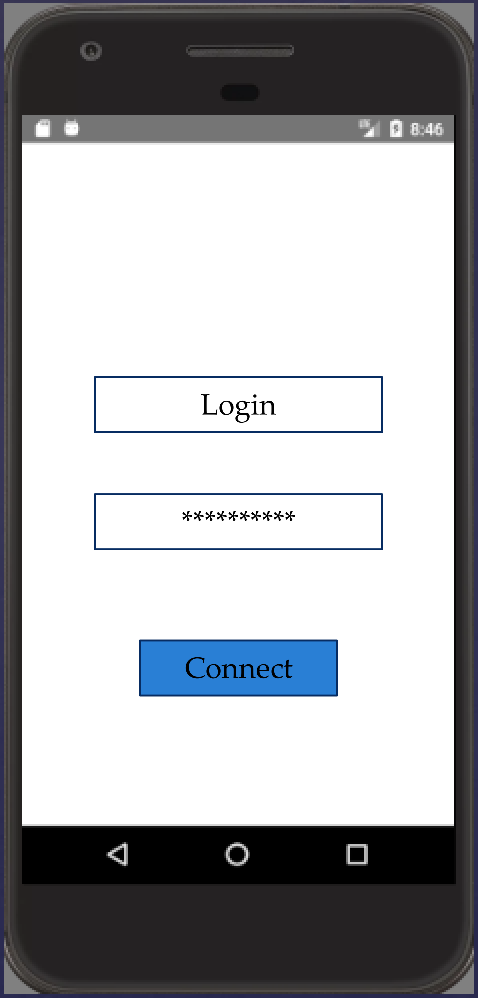
Intents

Example 1 : Implicit Intent

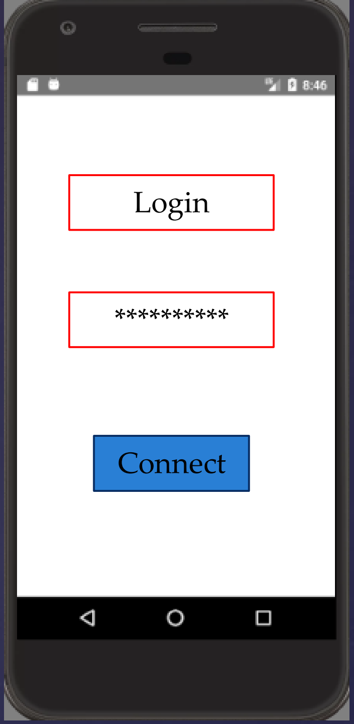
```
String q = “Tesla";
Intent intent = new Intent(Intent.ACTION_WEB_SEARCH );
intent.putExtra(SearchManager.QUERY, q);
startActivity(intent);
```

Login Page

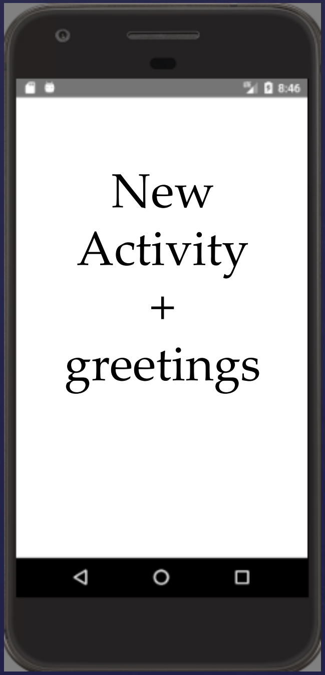
Example 4 :
Main Screen



Case user unknown



Case user known



Notifications

Android **Toast** class provides a handy way to show users alerts but problem is that these alerts are not persistent which means alert flashes on the screen for a few seconds and then disappears.

Example :

- Step 1: Create Notification Builder

NotificationCompat.BuildermBuilder=new NotificationCompat.Builder(this);

- Step 2: Once you have **Builder** object, you can set its Notification properties using Builder object as per your requirement. But this is mandatory to set at least following –
  - A small icon, set by **setSmallIcon()**
  - A title, set by **setContentTitle()**
  - Detail text, set by **setContentText()**

=>

```
mBuilder.setSmallIcon(R.drawable.notification_icon);
mBuilder.setContentTitle("Notification Alert, Click Me!");
mBuilder.setContentText("Hi, This is Android Notification Detail!");
```

Notifications

Example :

- Step 3: Attach Actions
  - This is an optional part and required if you want to attach an action with the notification. An action allows users to go directly from the notification to an **Activity** in your application

```
Intent resultIntent = new Intent(this, MainActivity.class);
TaskStackBuilder stackBuilder = TaskStackBuilder.create(this);
 stackBuilder.addParentStack(MainActivity.class);
// Adds the Intent that starts the Activity to the top of the stack
stackBuilder.addNextIntent(resultIntent);
PendingIntent resultPendingIntent =
stackBuilder.getPendingIntent(0,PendingIntent.FLAG_UPDATE_CURREN
T); mBuilder.setContentIntent(resultPendingIntent);
```

Notifications

Example :

- Step 4: Issue the notification
  - Finally, you pass the Notification object to the system by calling NotificationManager.notify() to send your notification.

```
NotificationManager mNotificationManager =
(NotificationManager)
getSystemService(Context.NOTIFICATION_SERVICE
);
// notificationID allows you to update the notification
later on.
 mNotificationManager.notify(notificationID,
mBuilder.build());
```

Sugar ORM (SQLite)

Step 1: Download via Gradle :

- implementation 'com.github.satyan:sugar:1.5‘

Step 2: Manifest File inside Application :

- android:name="com.orm.SugarApp“
- outside <Application>

```
<meta-data android:name="DATABASE" android:value=“Vehicles.db" />
<meta-data android:name="VERSION" android:value="2" />
<meta-data android:name="QUERY_LOG" android:value="true" />
<meta-data android:name="DOMAIN_PACKAGE_NAME"
android:value="com.example.myapplication.vehiclesModel" />
```

Sugar ORM (SQLite)

Step 3: Create the Model :

Step 4: Create the Layout / Activity:

Sending a Mail

Example .

```
// You will use ACTION_SEND action to launch an email client installed on your
Android device
Intent email = new Intent(Intent.ACTION_SEND, Uri.parse("mailto:"));
 email.putExtra(Intent.EXTRA_EMAIL, recipients);
email.putExtra(Intent.EXTRA_SUBJECT, subject.getText().toString());
 email.putExtra(Intent.EXTRA_TEXT, body.getText().toString());
startActivity(Intent.createChooser(email, "Choose an email client from..."));
```

Tests

Example 1 : Robolectric
http://robolectric.org/

Example 2 : Espresso
https://developer.android.com/training/testing/espresso

Any Questions?

Is coding an instrument?