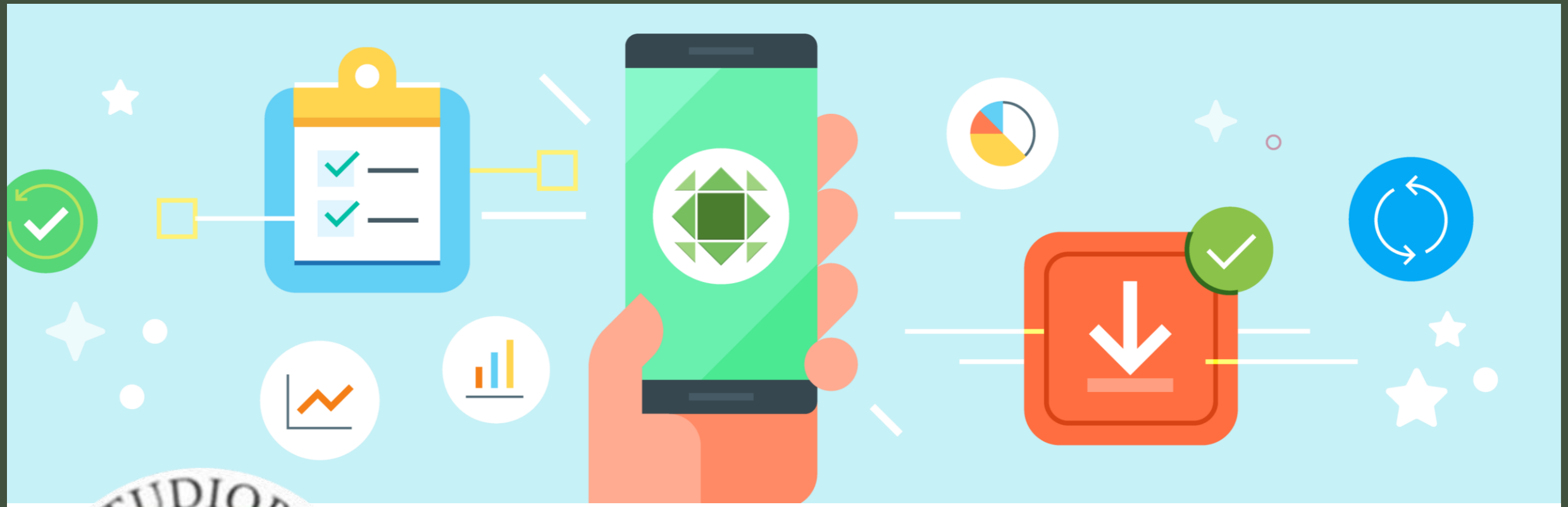
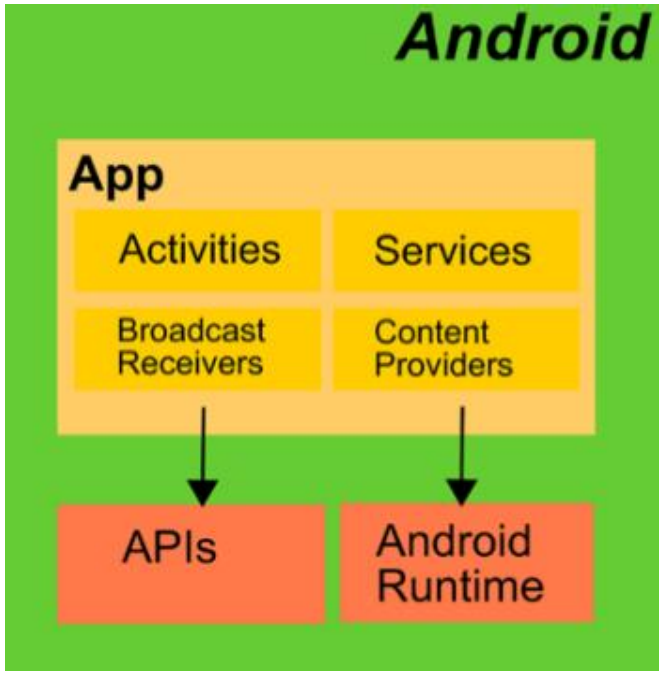
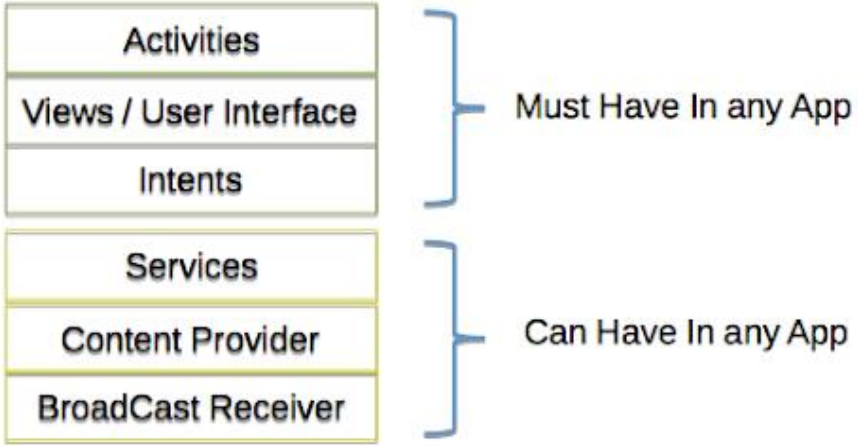


Android Applications

An app in the Android OS

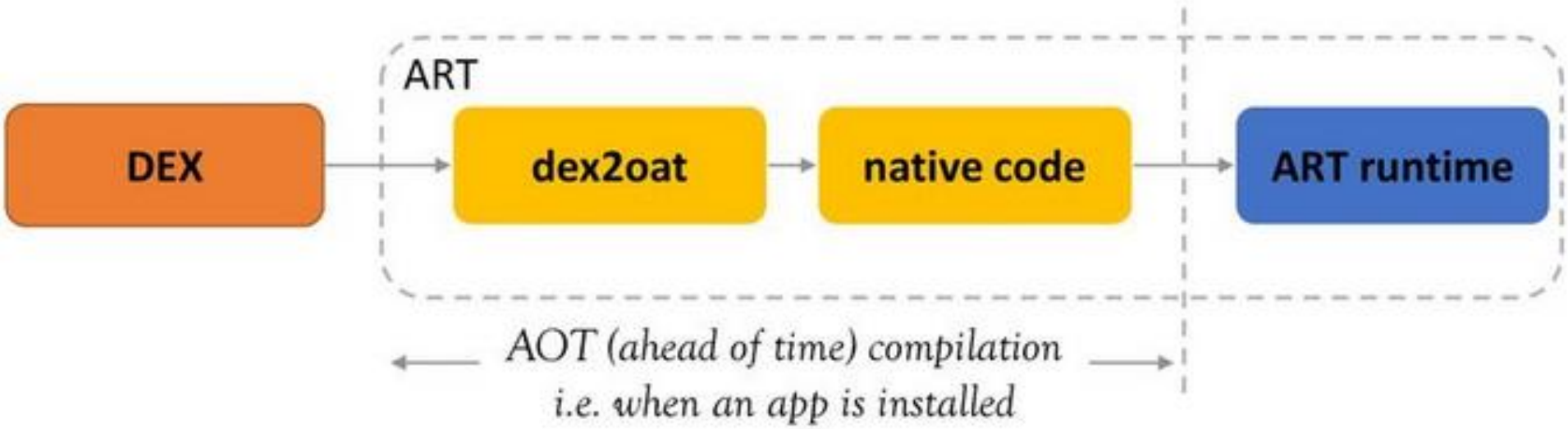
- An Android app consists of components such as
  - activities,
  - services,
  - broadcast receivers,
  - content providers





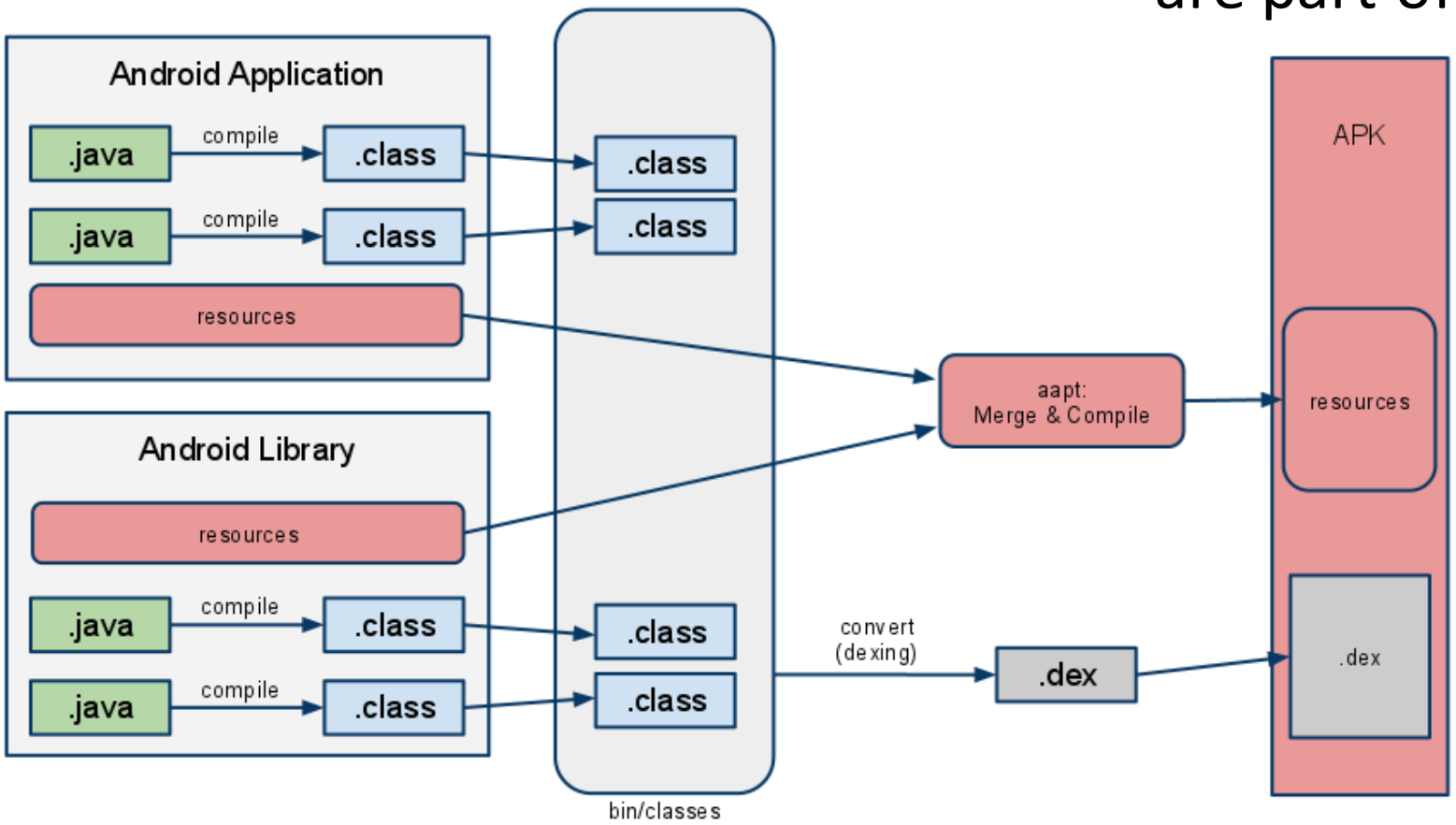
What is ART?

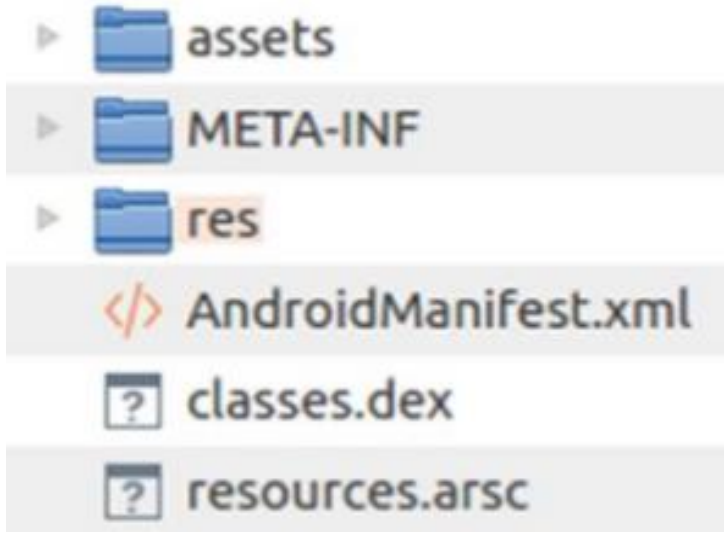
- ART = Android Runtime (it's like Java Runtime)
- Pros: Faster application execution.
- Cons: Longer installation time, more storage requirement.



APK

- It describes the app and
- declares all the components that are part of the app.





The Application Manifest

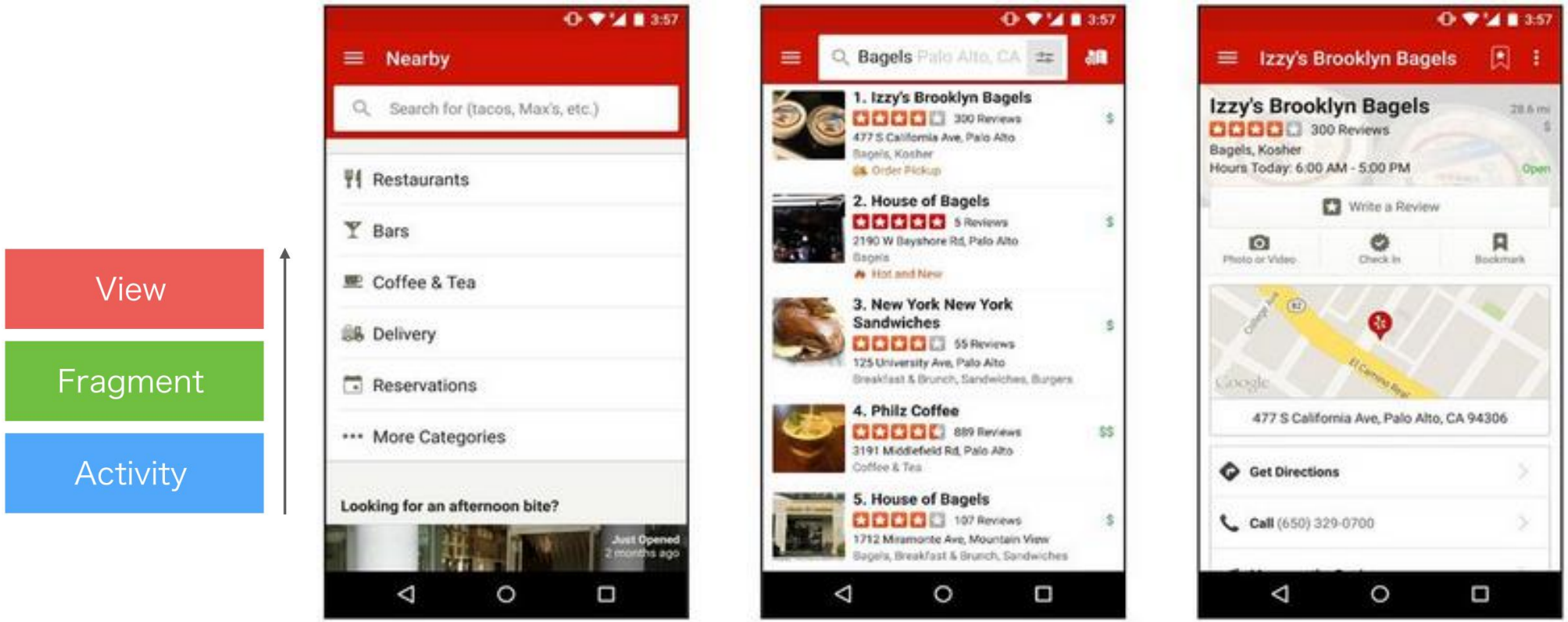
- Every Android app you create needs a Manifest file.
- is a crucial part of your Android app
- is in XML format
- contains
  - the name of your Java package,
  - The lists components like Activities, services, content providers,
  - permissions, etc

```
<manifest xmlns:android="http://schemas.android.com/apk/res/android
    xmlns:tools="http://schemas.android.com/tools"
    package="com.ekremozan.services">

    <uses-permission android:name="android.permission.FOREGROUND_SE

    <application
        android:allowBackup="true"
        android:icon="@mipmap/ic_launcher"
        android:label="Services"
        android:roundIcon="@mipmap/ic_launcher_round"
        android:supportsRtl="true"
        android:theme="@style/AppTheme"
        tools:ignore="GoogleAppIndexingWarning">
        <activity android:name=".MainActivity">
            <intent-filter>
                <action android:name="android.intent.action.MAIN" /
                <category android:name="android.intent.category.LAU
            </intent-filter>
        </activity>
        <service android:name=".SampleService"/>
        <service android:name=".SampleIntentService"/>
        <service android:name=".BoundService"/>
        <service android:name=".SampleForegroundService"/>
    </application>

</manifest>
```

- <provider> elements for **content providers**
- <receiver> elements for **broadcast receivers**

Activity

- An activity represents a single screen with a user interface.



Service

- Runs in the background to perform long running operations or do some work for remote processes.
- A service does not provide a user interface.
- Yes, you can create your own services too.

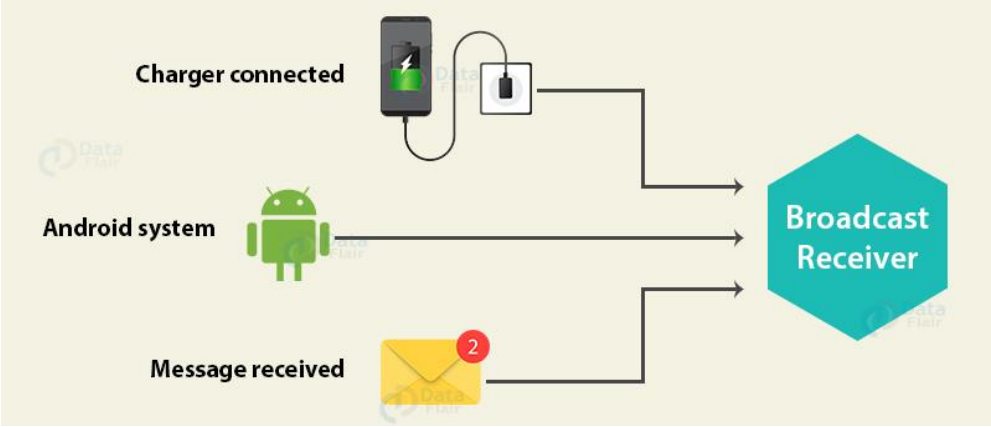
- Settings>Developer Options>Running Services

Content Provider

- A content provider manages a shared set of app data.
- Other apps can query or even modify the data.
- You can store the data in the file system, an SQLite database, on the web, or any other persistent storage location your app can access.

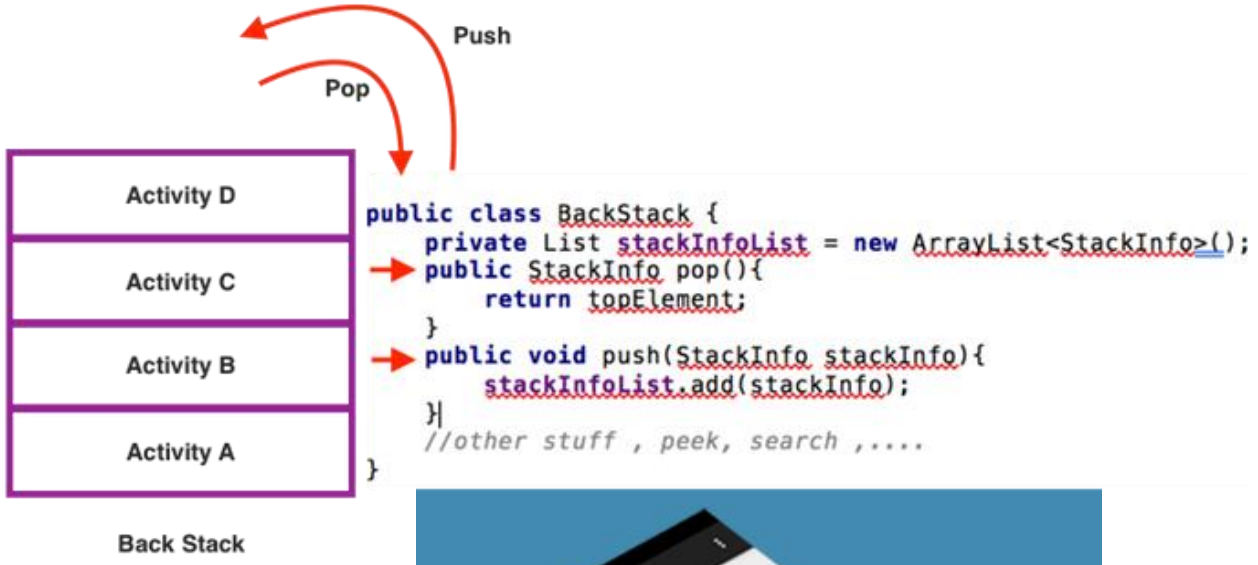
Broadcast Receiver

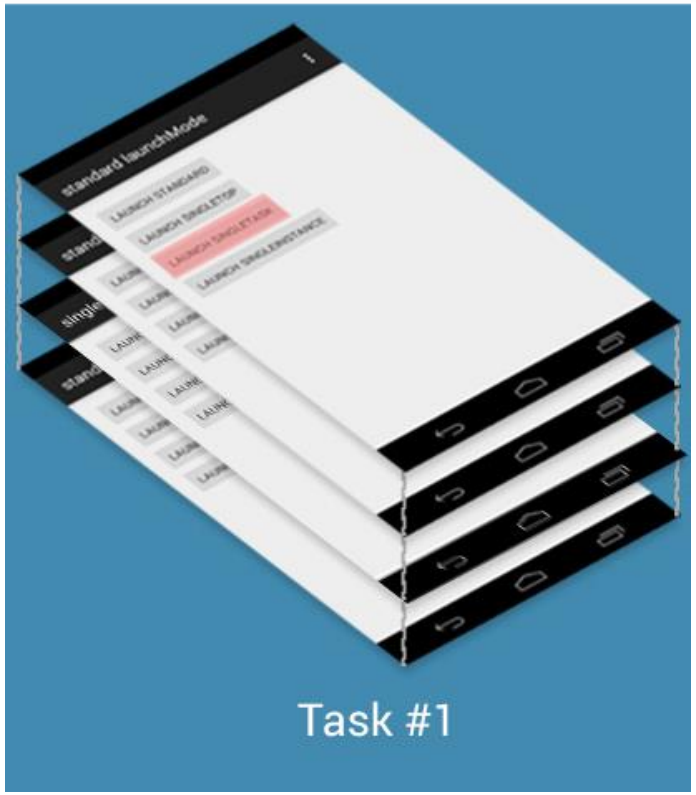
- A broadcast receiver is a component that responds to system-wide broadcast announcements.
  - Originate from the system—the battery is low, or a picture was captured.
  - Initiated by an App – download completed.
- Broadcast receivers don't display a user interface, they may create a status bar notification.



Tasks

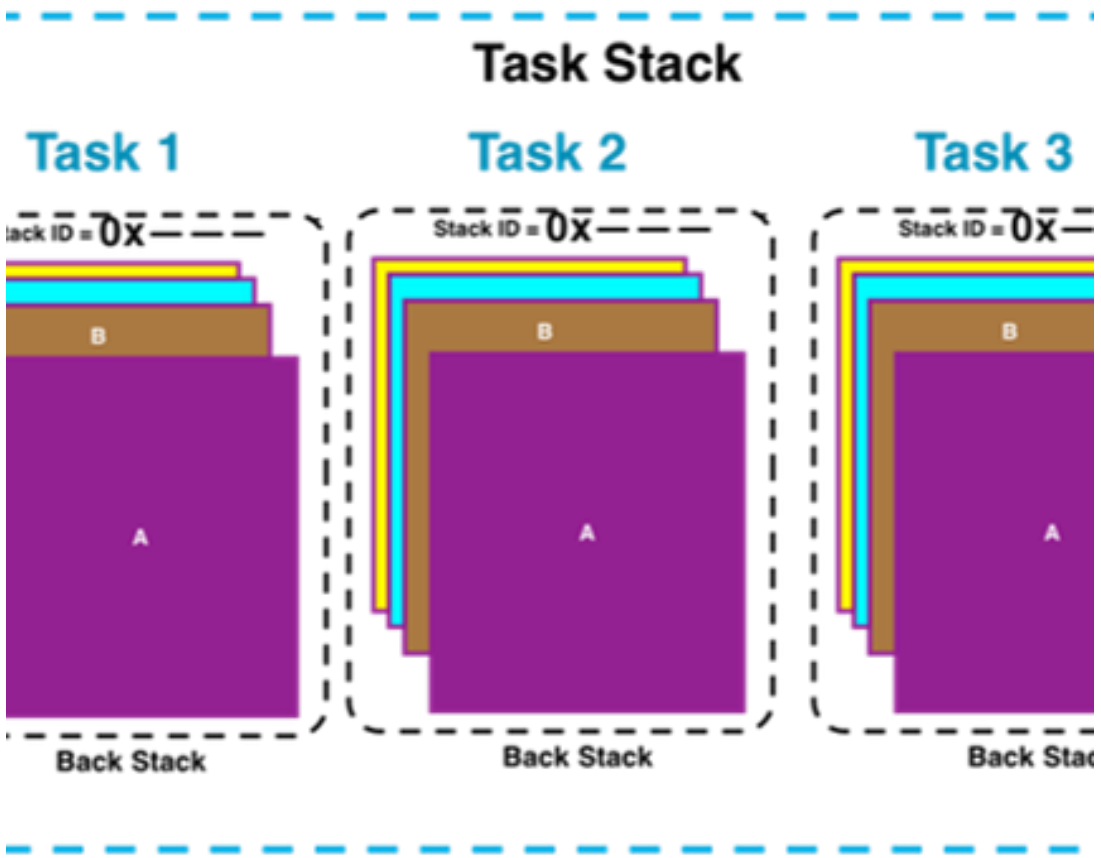
- A task is a group of activities interacting with each other in such a way.
- A user starts an app and sees the main activity, does some work there, opens and closes subactivities, maybe switches to another app, comes back, and eventually closes the app.



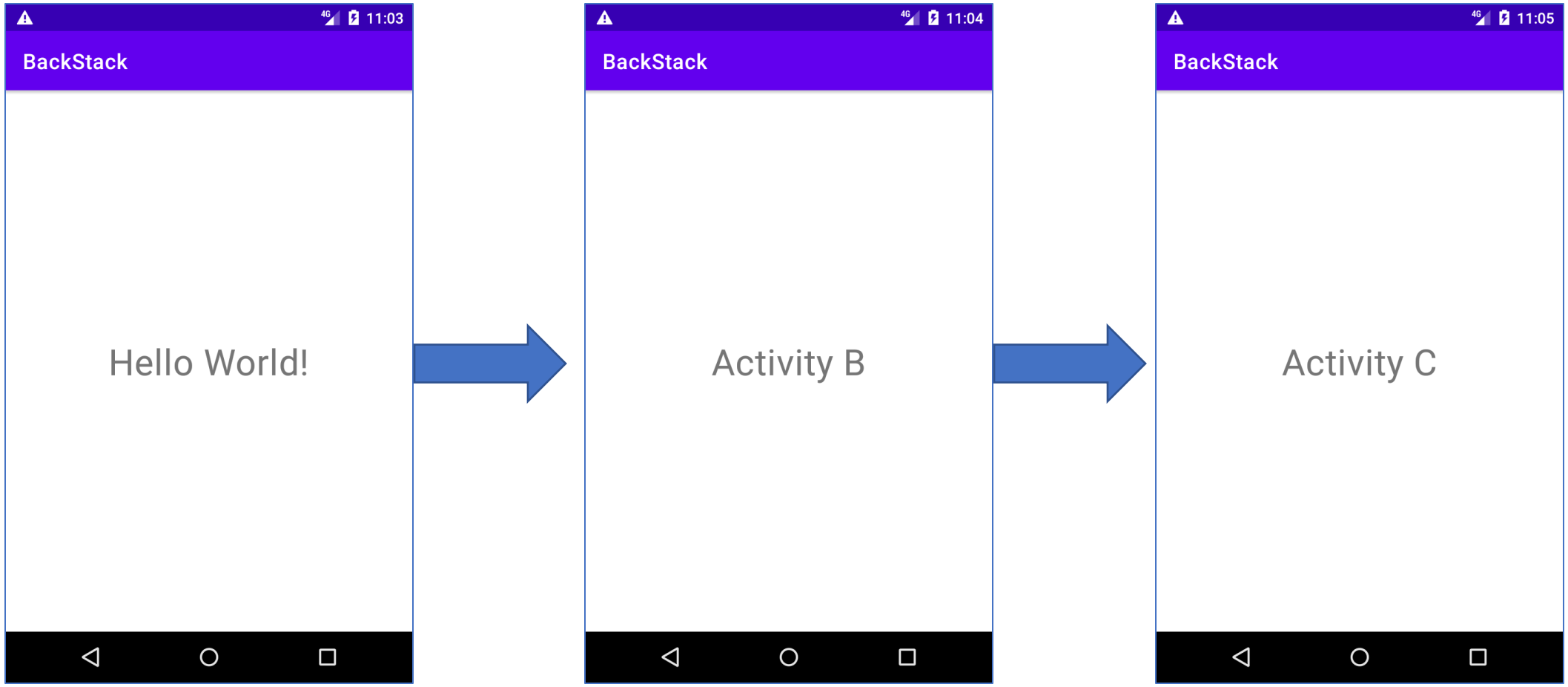


Tasks Stack and Back Stack

- Backstack is the stack of Activities for a single task in which you can navigate from one Activity to another
- TasksStack : is the stack of all Tasks that system mange to keep track of all tasks(from different Applications) currently running on your device, you can see it by tapping on TaskManager button (new devices) , then all currently running Tasks will be show up .



Back Stack example

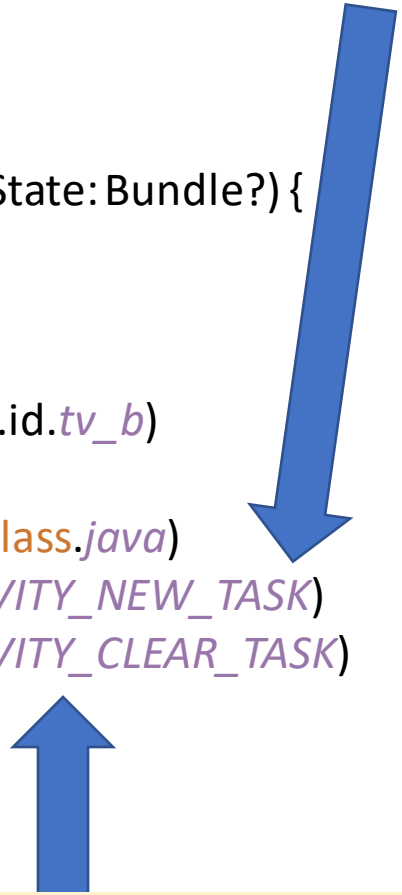


Back Stack example

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

    val tvMain = findViewById<TextView>(R.id.tv_main)
    tvMain.setOnClickListener {
      val intent = Intent(this, ActivityB::class.java)
      startActivity(intent)
    }
  }
}
```

If set, this activity will become the **start of a new task** on this history stack

```
class ActivityB : AppCompatActivity() {
  override fun onCreate(savedInstanceState: Bundle?) {
    super.onCreate(savedInstanceState)
    setContentView(R.layout.activity_b)

    val tvB = findViewById<TextView>(R.id.tv_b)
    tvB.setOnClickListener {
      val intent = Intent(this, ActivityC::class.java)
      intent.addFlags(Intent.FLAG_ACTIVITY_NEW_TASK)
      intent.addFlags(Intent.FLAG_ACTIVITY_CLEAR_TASK)
      startActivity(intent)
    }
  }
}
```



this flag will cause any existing task that would be associated with the activity to be cleared before the activity is started.