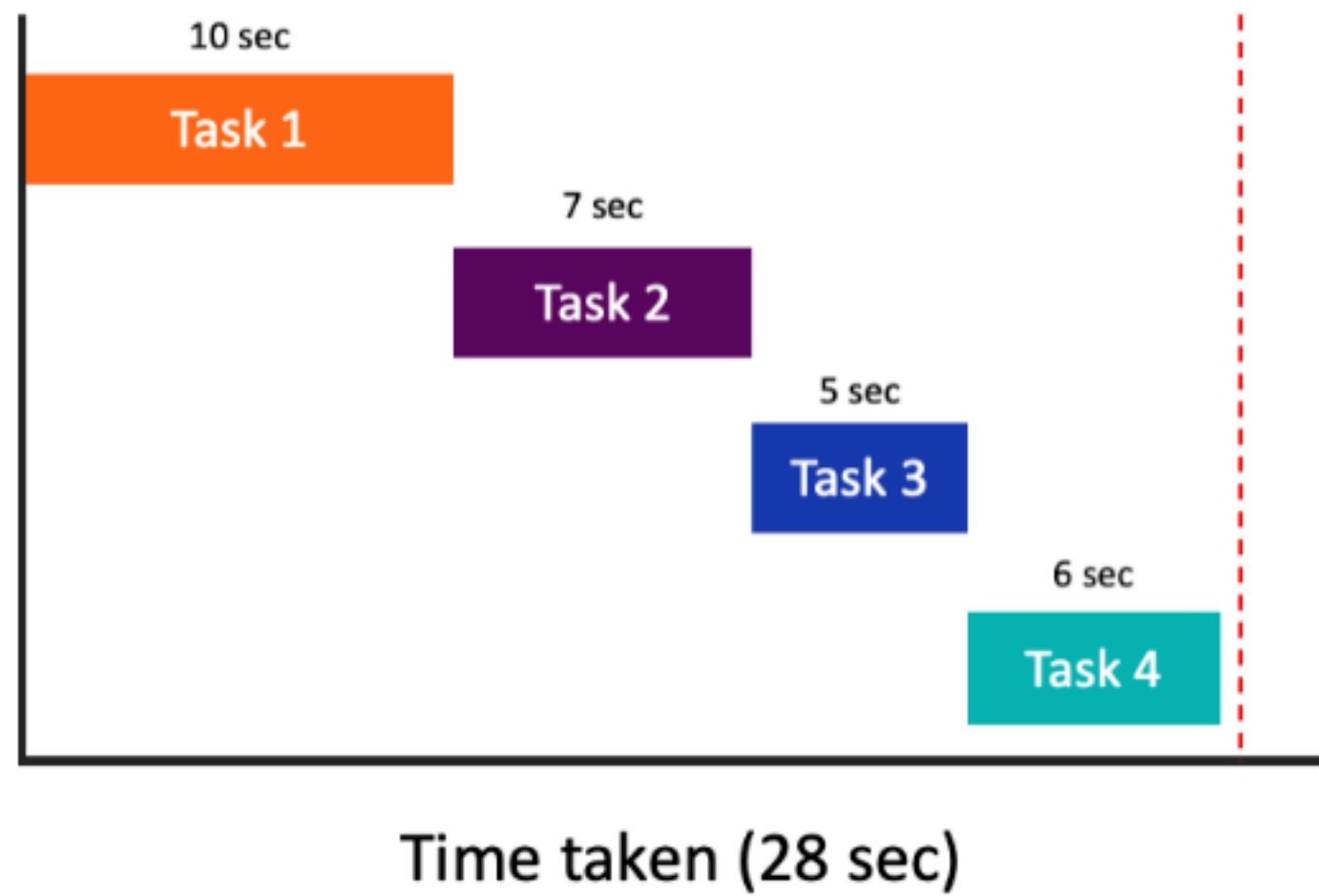# AsyncTask

Android Development

NIFR 2023

AsyncTask
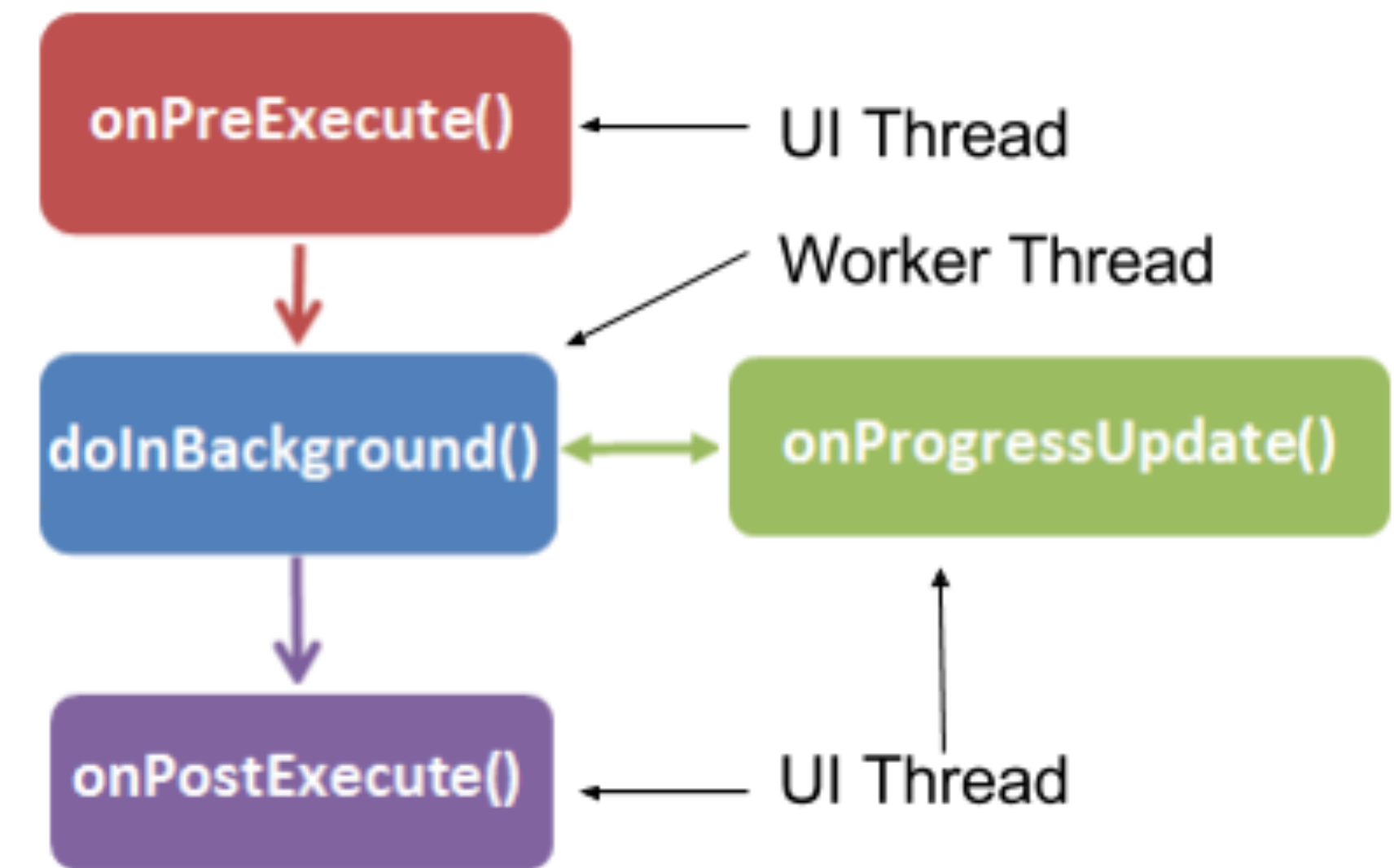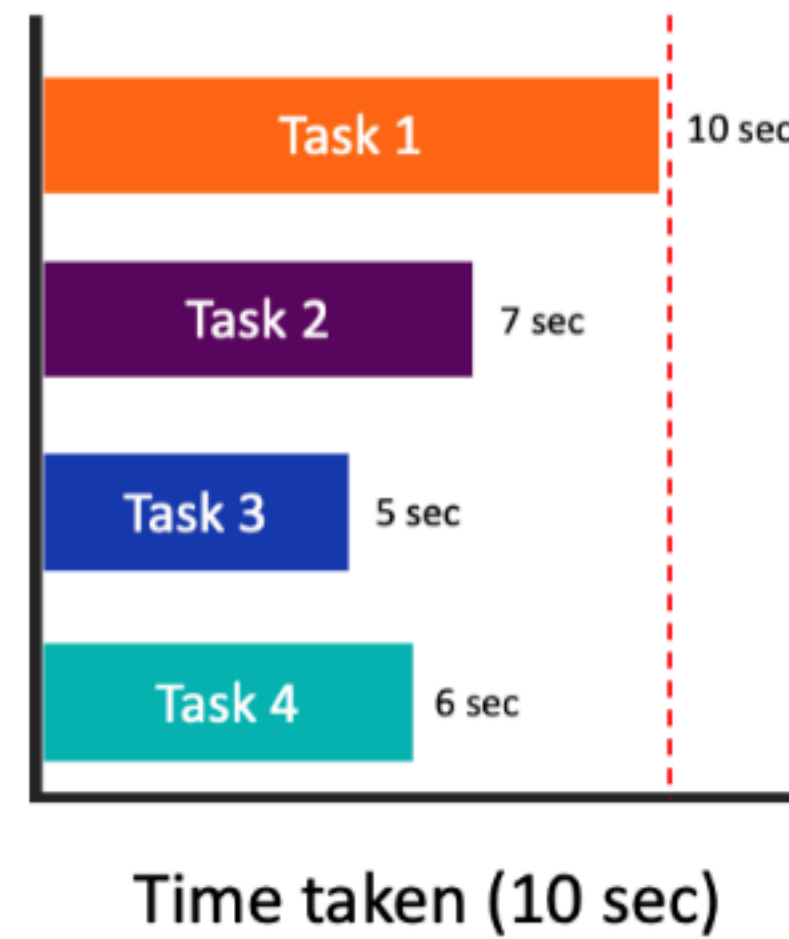## Android Development

- Asynchronous operations

- AsyncTask

  - WeakReference

- Splitting a String

- Modelling data

SYNCHRONOUS

10 sec	Task 1
7 sec	Task 2
5 sec	Task 3
6 sec	Task 4

Time taken (28 sec)

ASYNCHRONOUS

Task 1   10 sec
Task 2   7 sec
Task 3   5 sec
Task 4   6 sec

Time taken (10 sec)

onPreExecute() ← UI Thread

Worker Thread

doInBackground() ⟷ onProgressUpdate()

onPostExecute() ← UI Thread

Example of async tasks?

You cannot return values from an asynchronous operation

Callbacks when asynchronous

Synchronous   vs.   Asynchronous

Fetch data from API

Provide callback method

Actions happen inside callback

Synchronous "mindset"

Does not work in asynchronous

```
1  String url = "www.dadjokes.com";
2  String data = getDataFromApi(url);
3  return data;
```

If we "wait" thread is blocked

Asynchronous "mindset"

```
1  public void (method callback){
2      String url = "www.dadjokes.com";
3      String data = getDataFromApi(url);
4      callback(data);
5  }
```
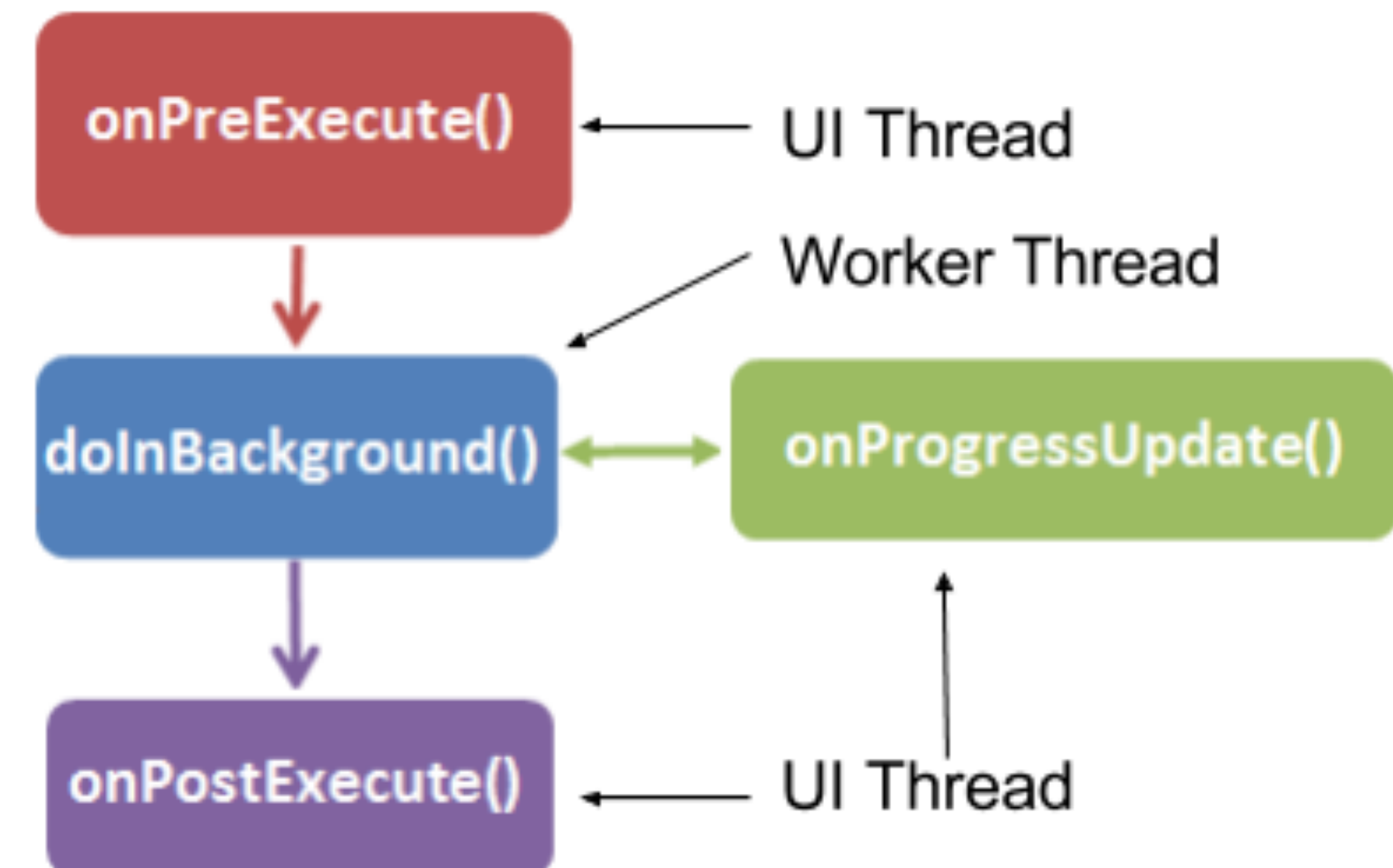
No thread is blocked

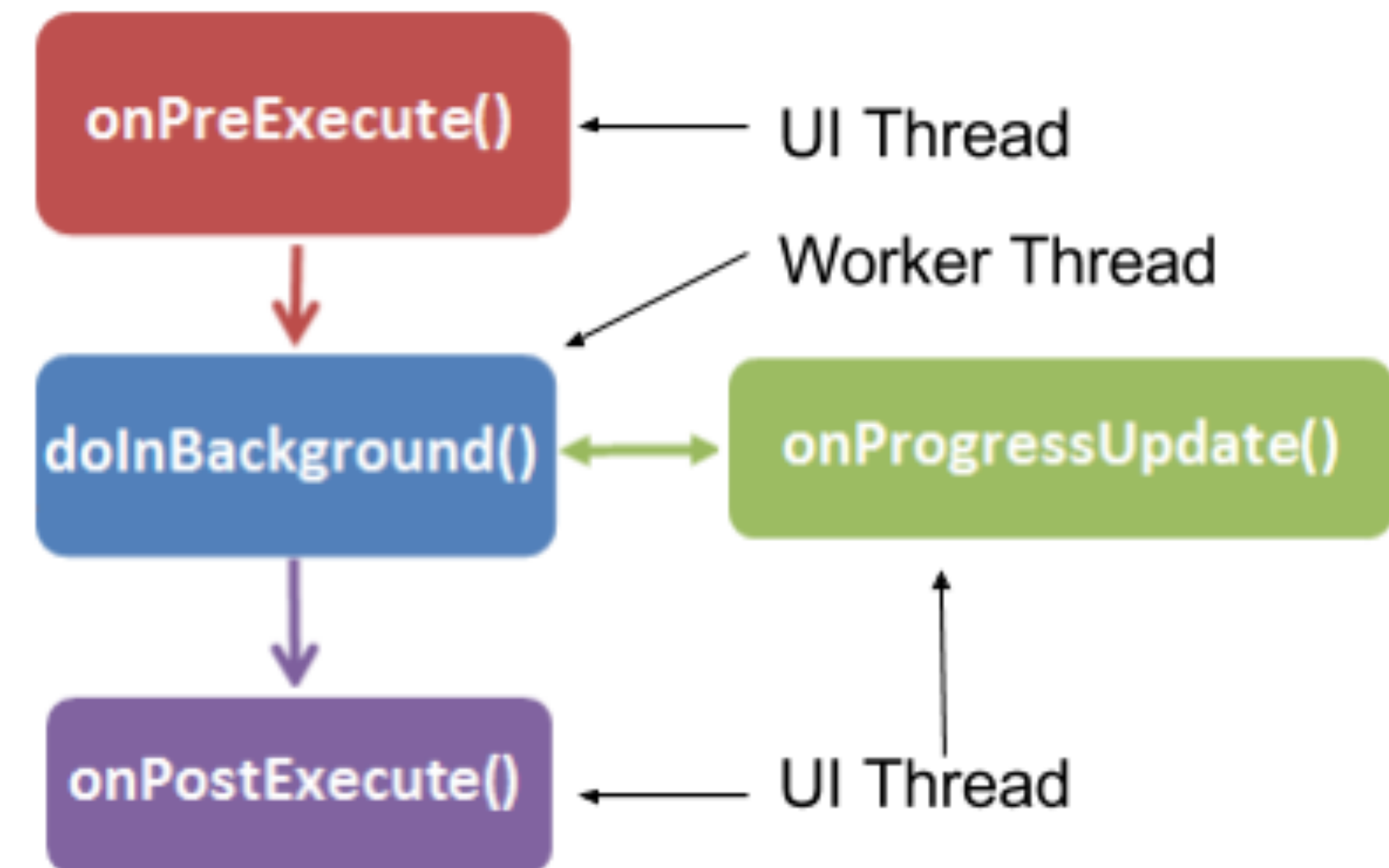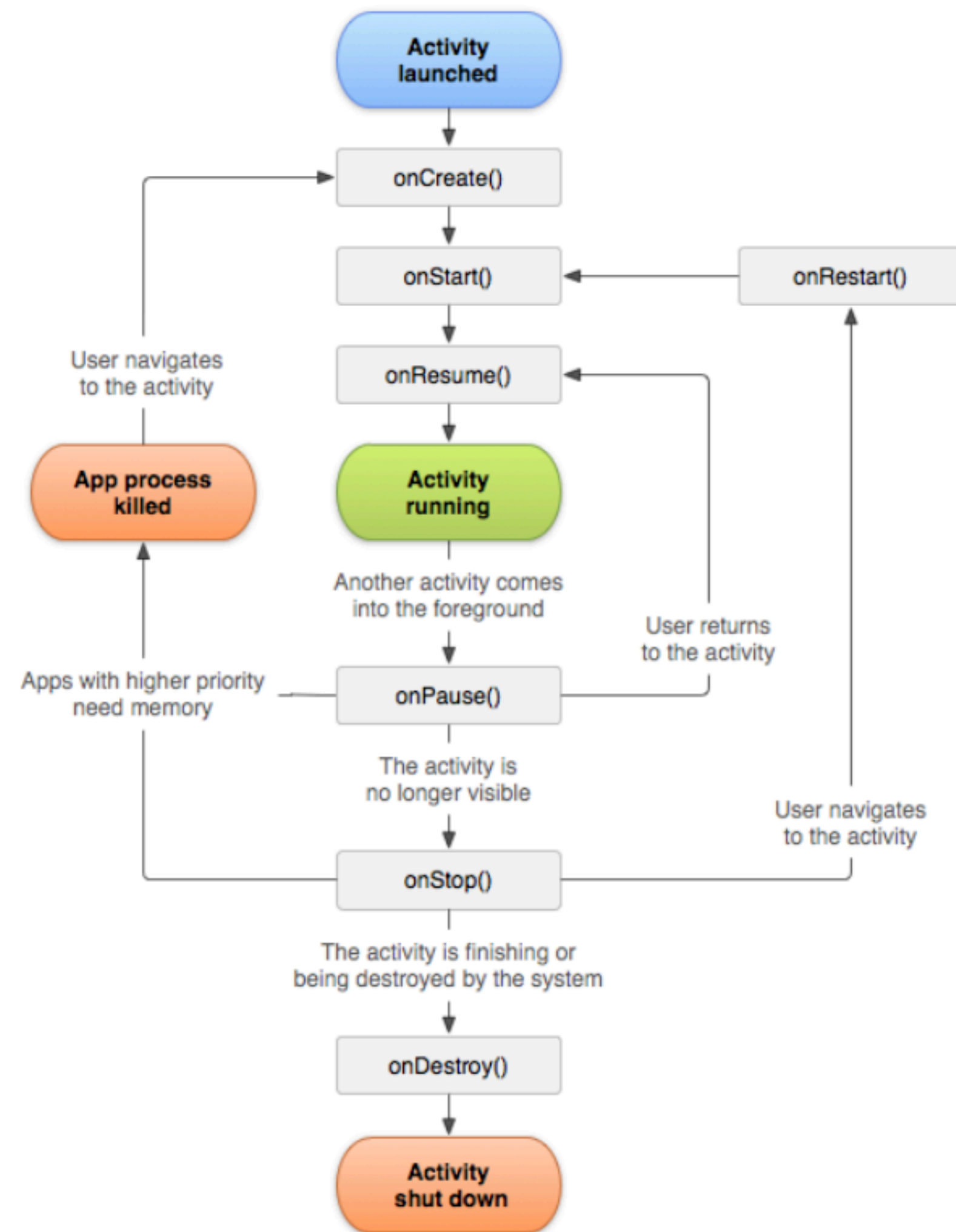Example is the Javascript way - Java/ Android is a little different, but same concept

```
public class SimpleAsyncTask extends AsyncTask <Void, Void, String>{}
```

```java
public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }
}
```

AsyncTask
Implementation details

```
public class SimpleAsyncTask extends AsyncTask <Void, Void, String>{}
```
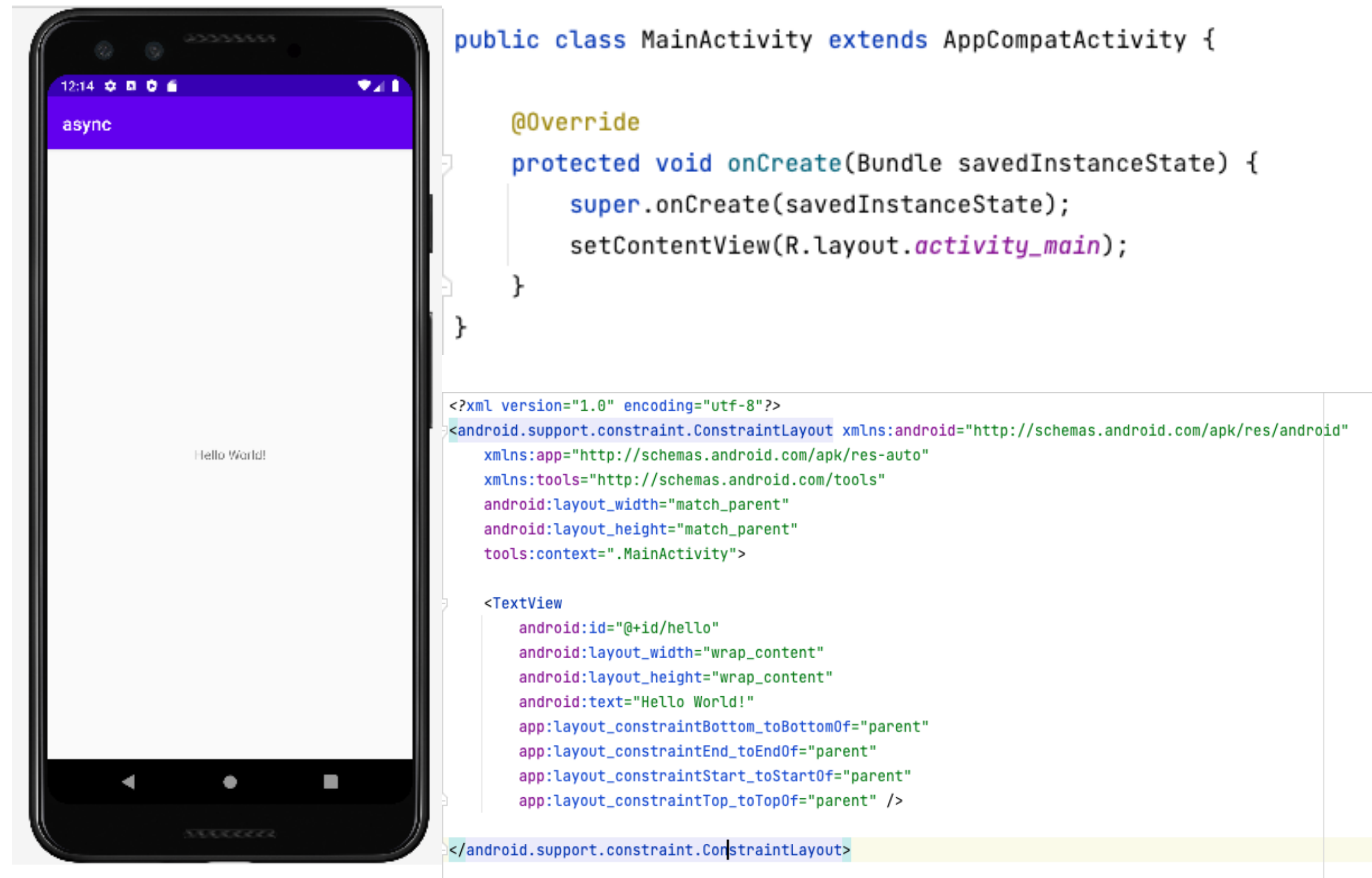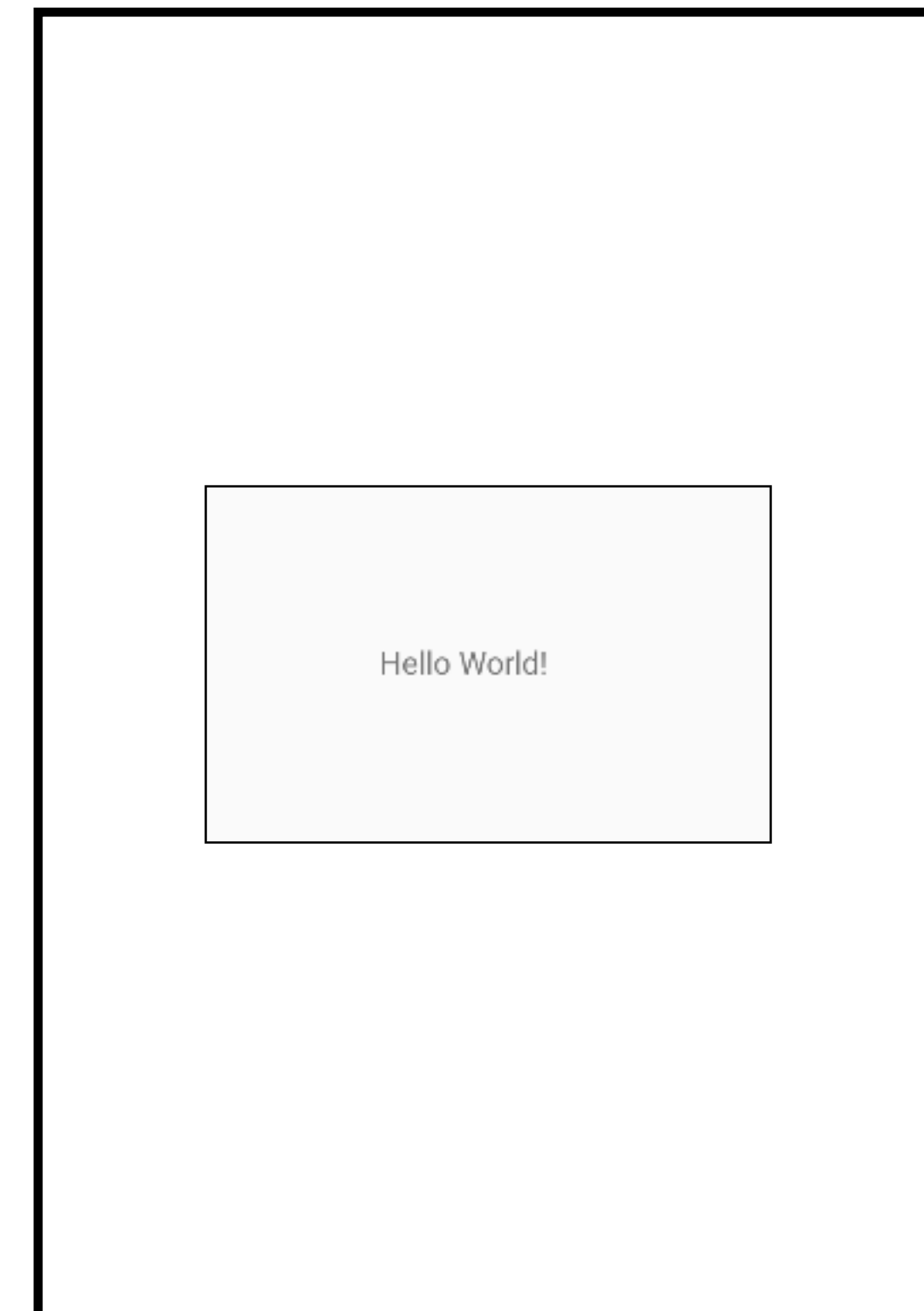
**String Value
Third Parameter in signature**

| doInBackground | → | onPostExecute |

WeakReference
Element Subject to change

onPostExecute

```java
public class MainActivity extends AppCompatActivity {

    @Override
    protected void onCreate(Bundle savedInstanceState) {
        super.onCreate(savedInstanceState);
        setContentView(R.layout.activity_main);
    }

}
```

```xml
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout xmlns:android="http://schemas.android.com/apk/res/android"
    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:id="@+id/hello"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Hello World!"
        app:layout_constraintBottom_toBottomOf="parent"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintStart_toStartOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

</android.support.constraint.ConstraintLayout>
```

Hello World!

Example BasicAsyncTask

Parsing data with split( );

Object Models