

Lecture #10

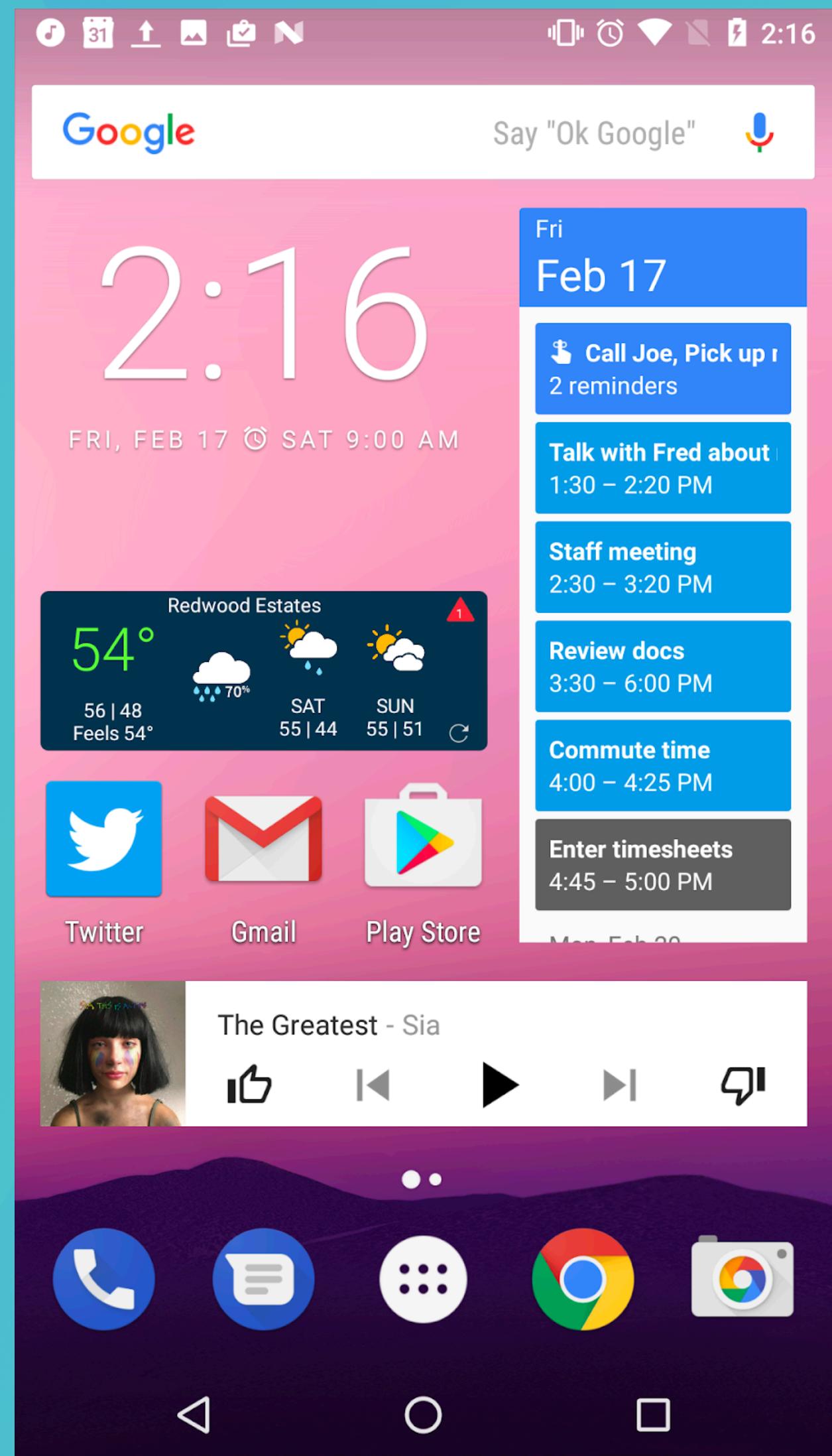
Advanced Mobile

Development

Mobile Applications 2020-2021

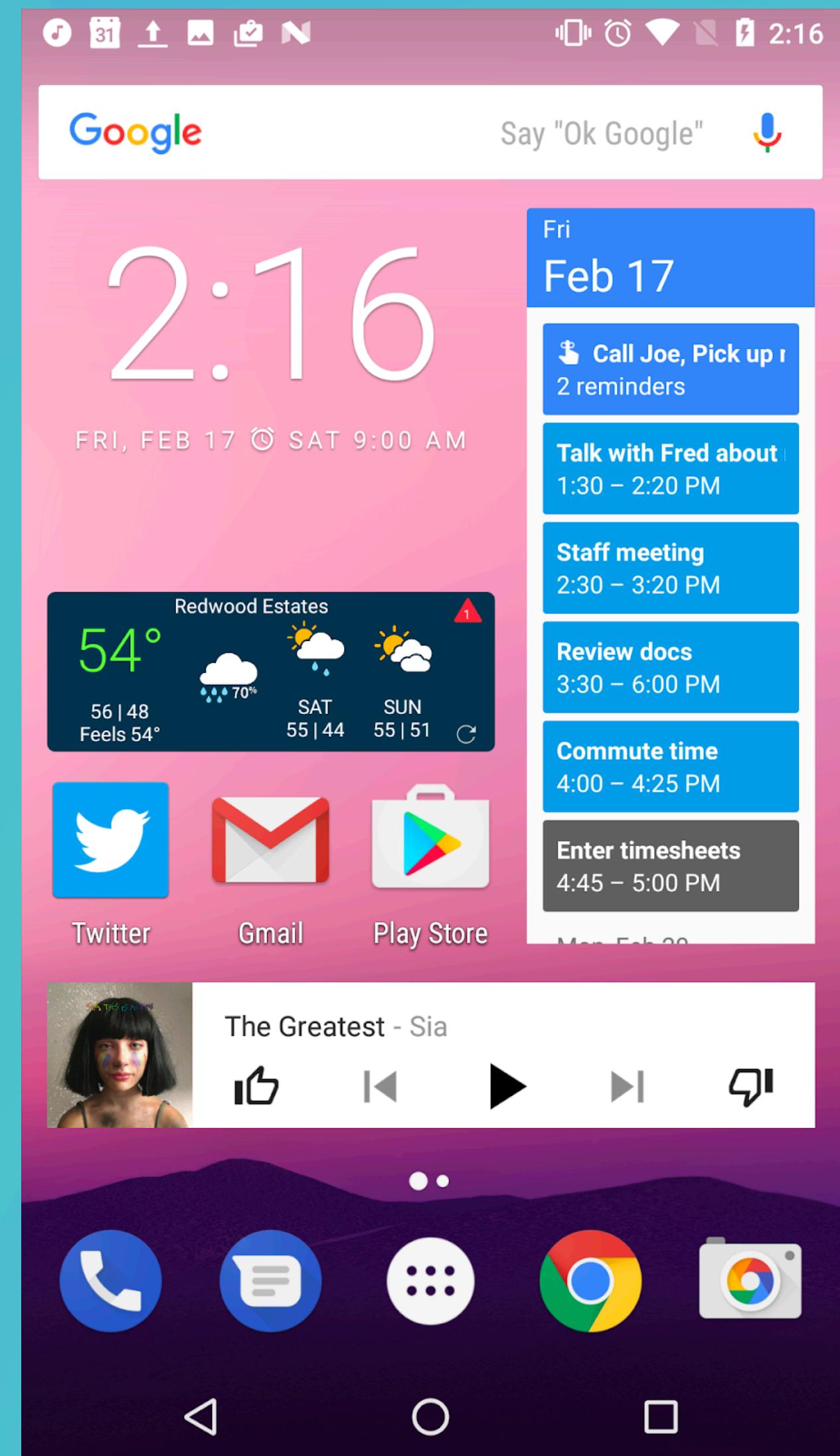
App Widgets

- A miniature app view.
- Runs on the home screen.
- Updated periodically.
- Display small amounts of information.
- Perform simple functions.



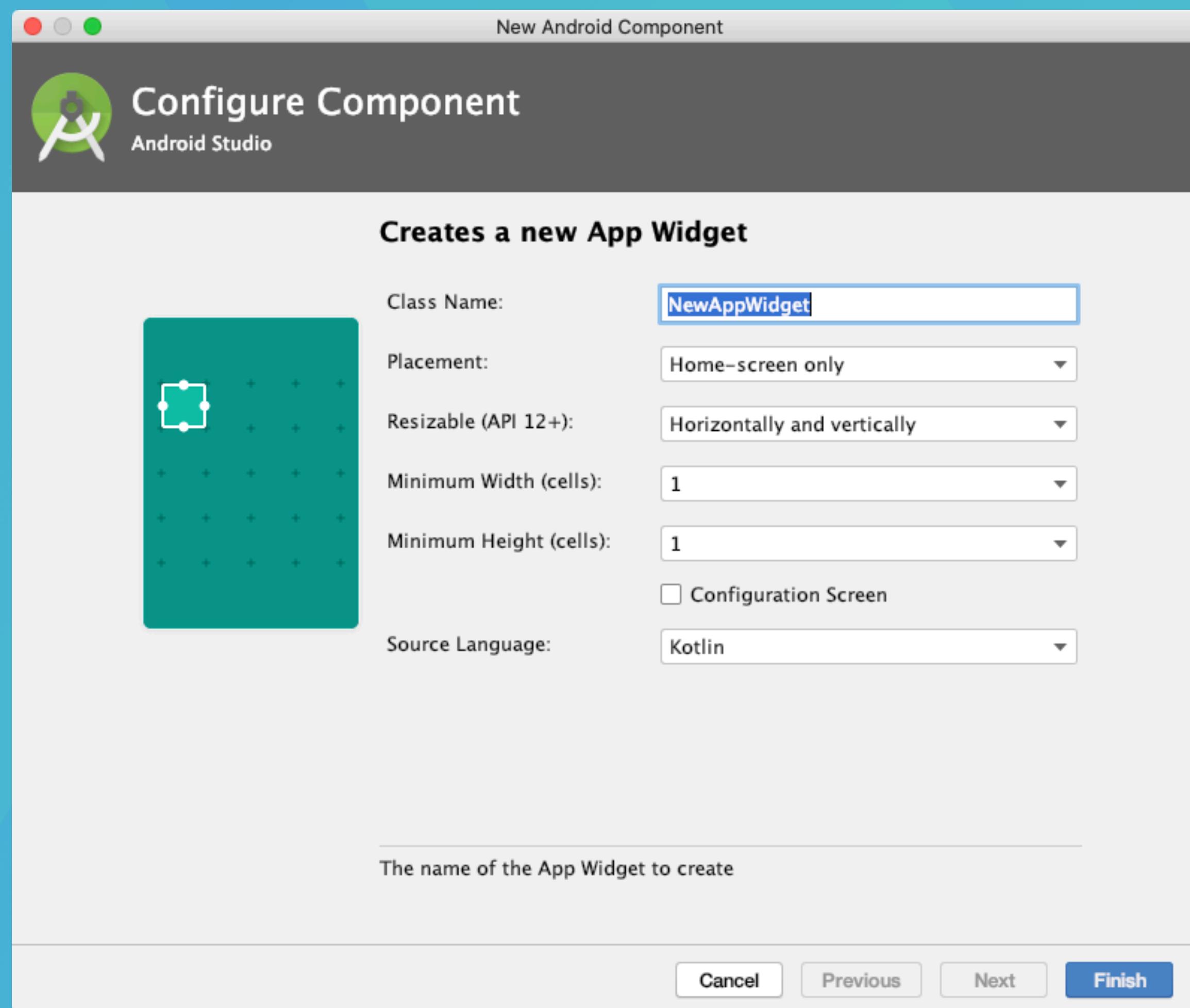
App Widgets

- Add-ons for an existing app.
- An app can have multiple widgets.
- Not available without an app.
- The default action is to start the app.

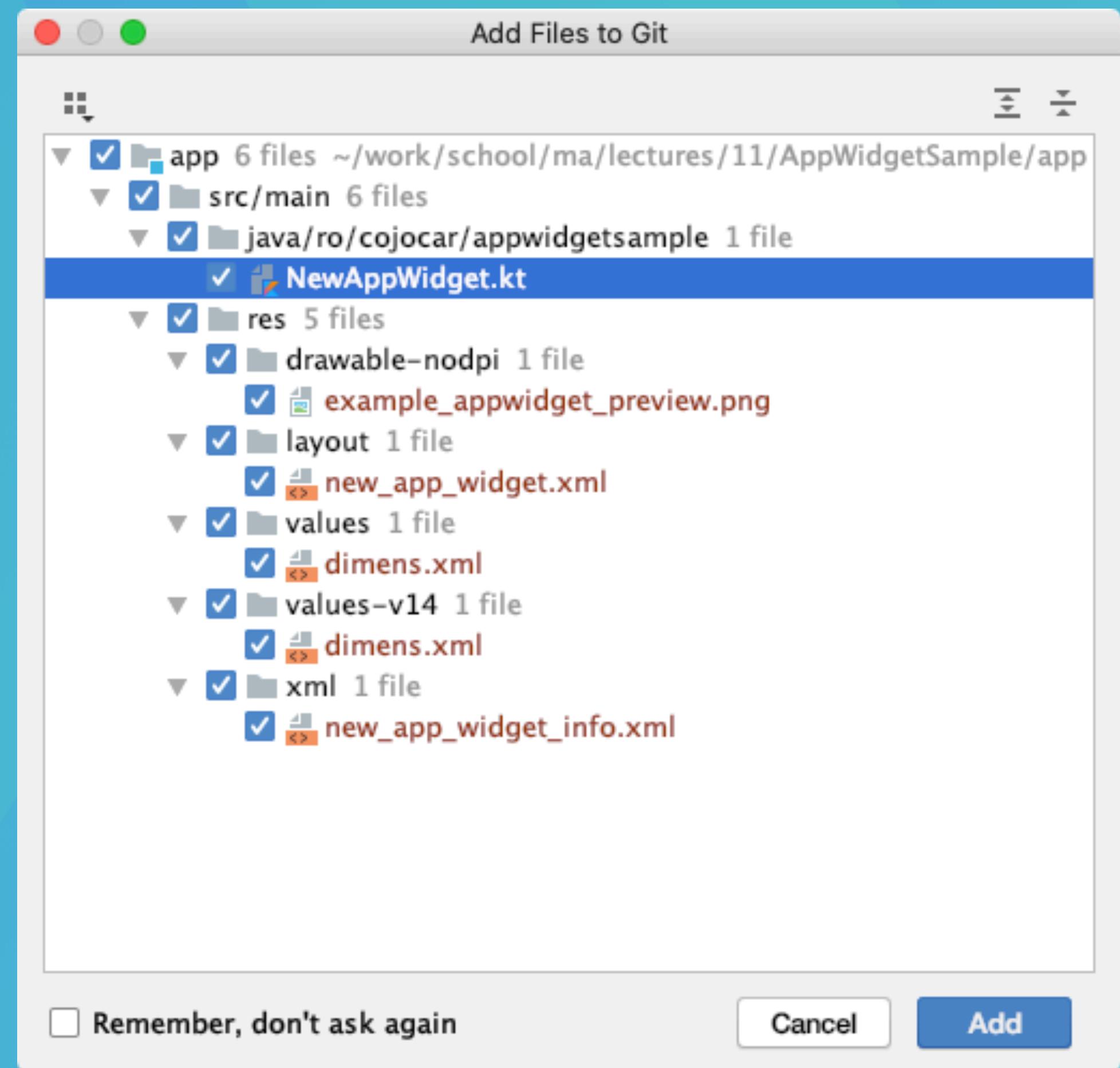


Set up the app widget project

- File > New > Widget > AppWidget.



Generated Files

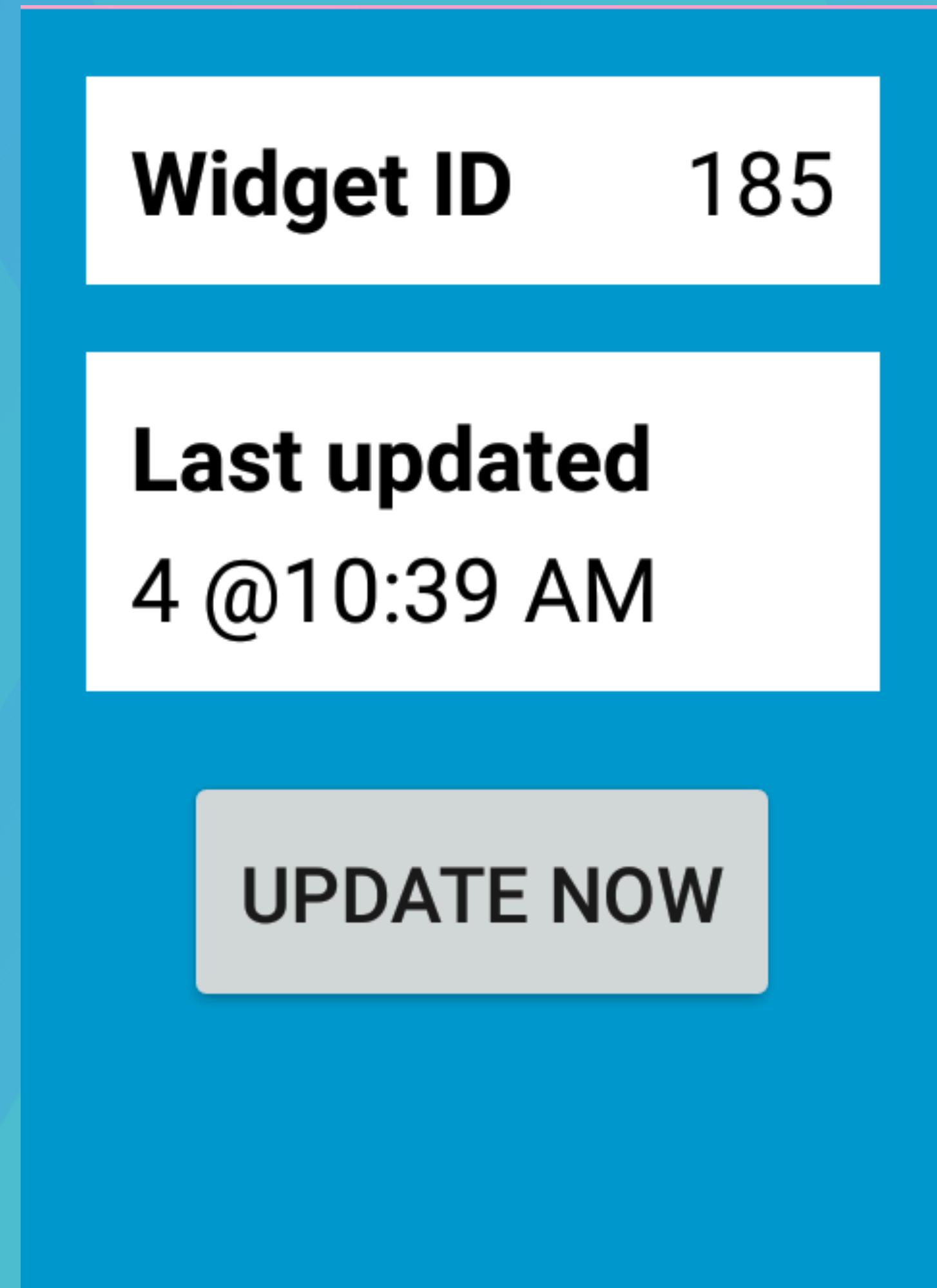


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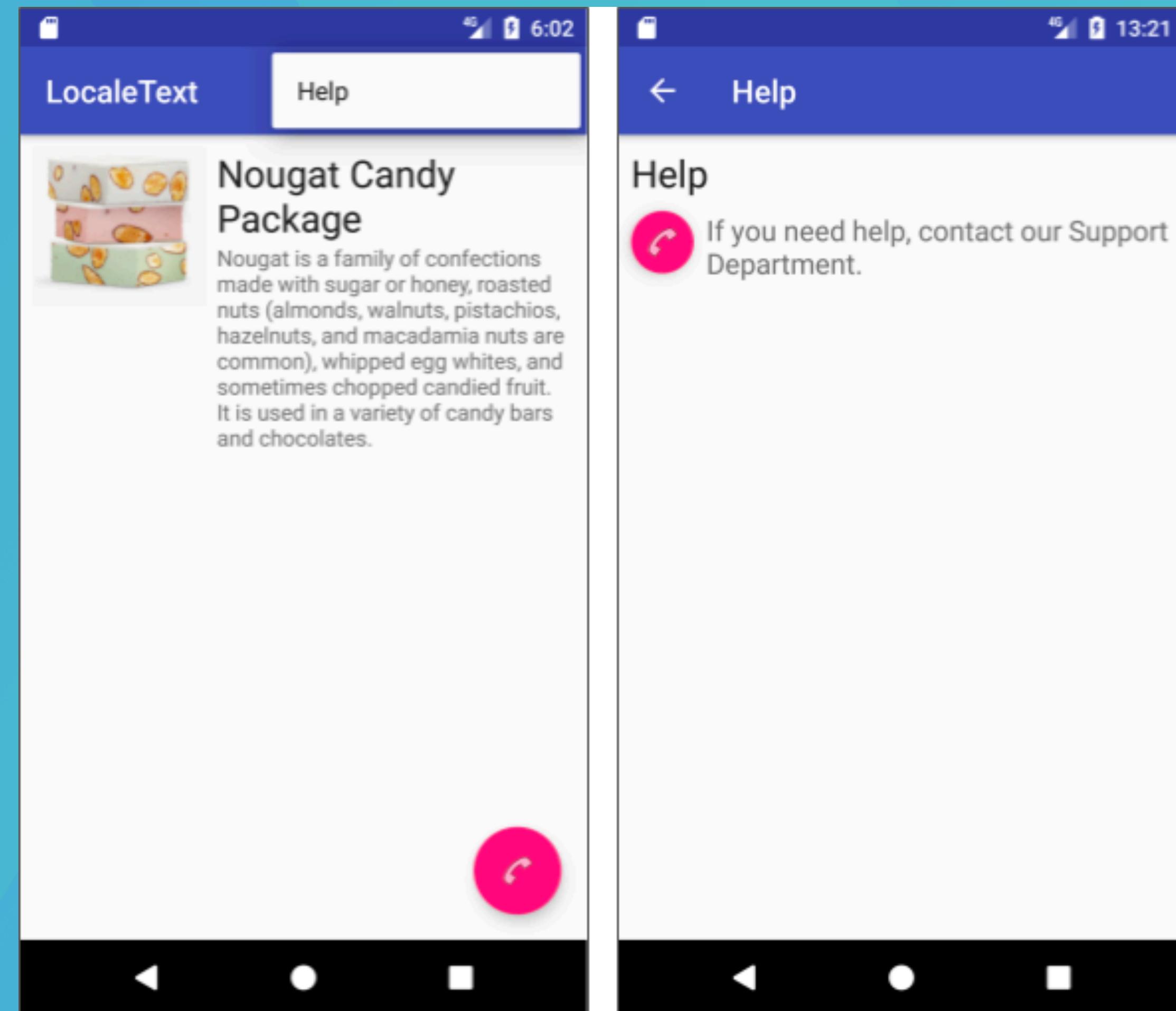
youtube.com/dancojocar

DEMO

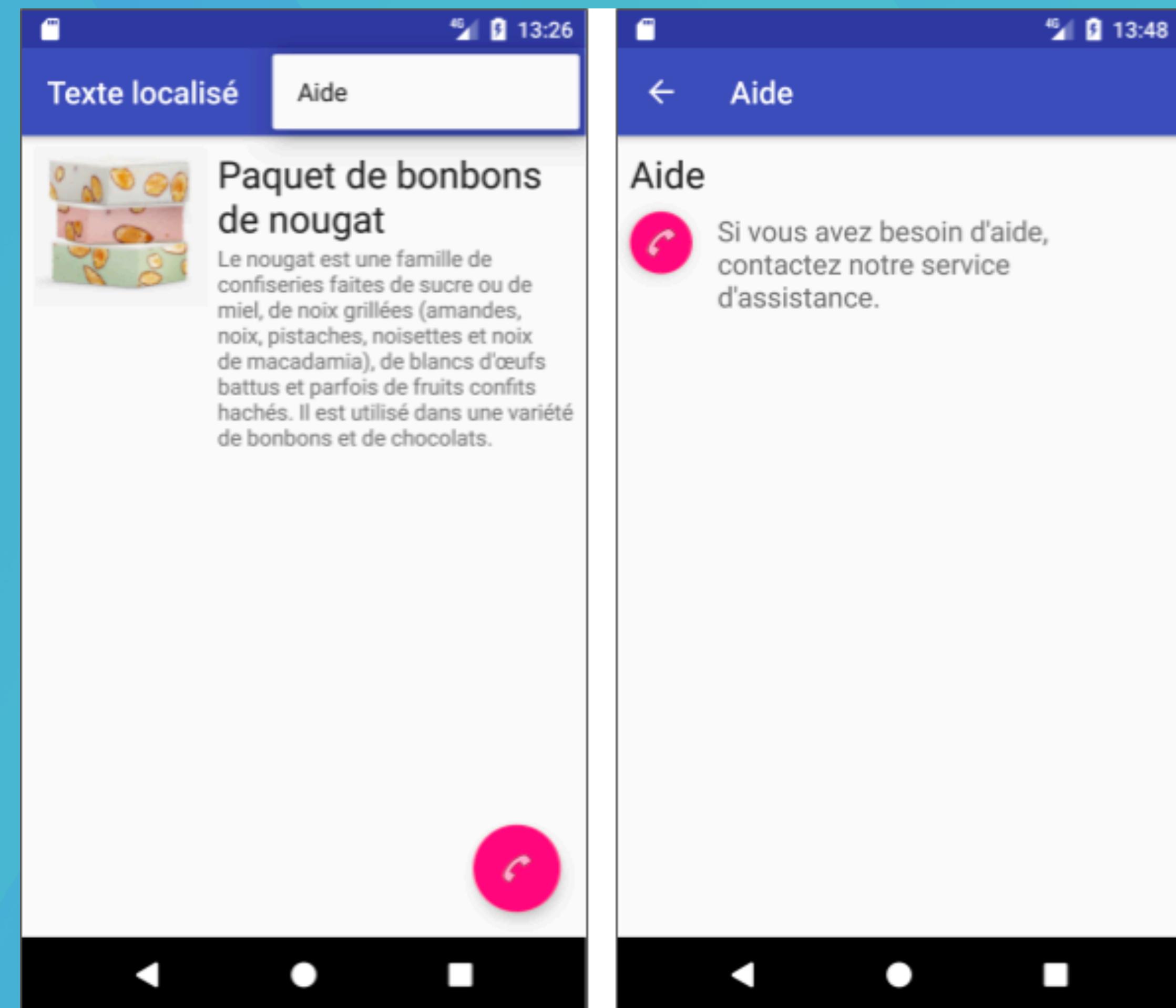
Customize the widget



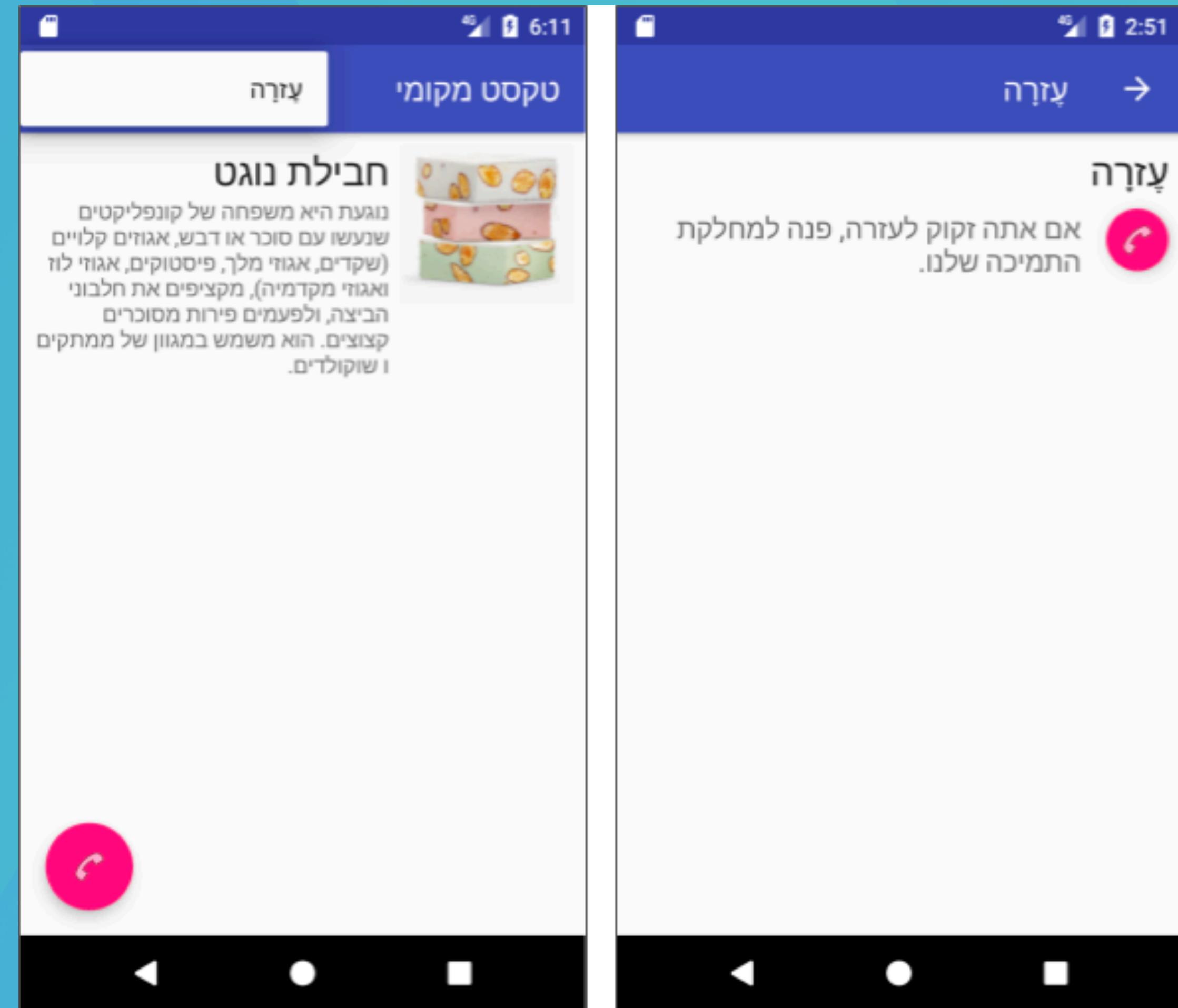
Language Support



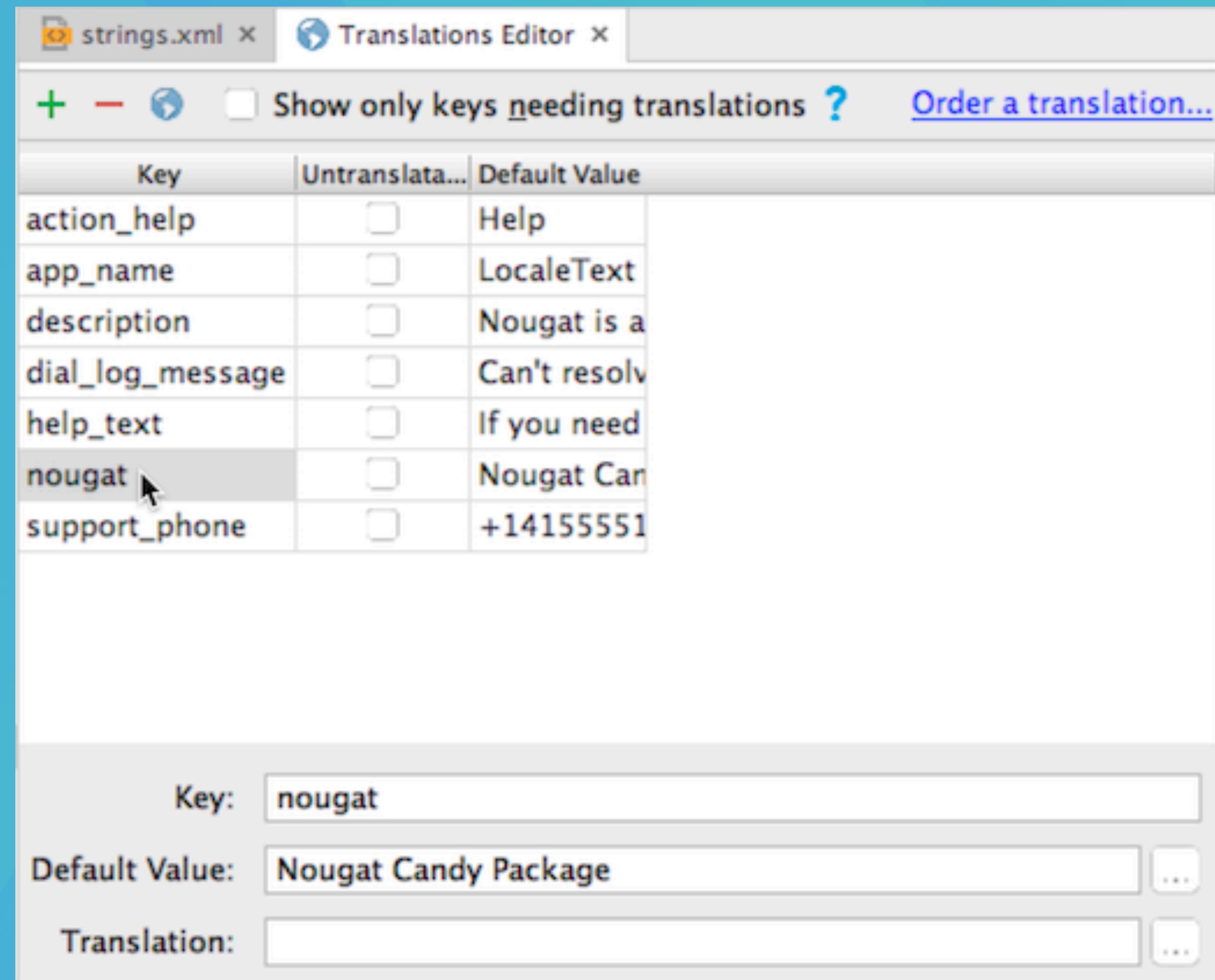
Language Support



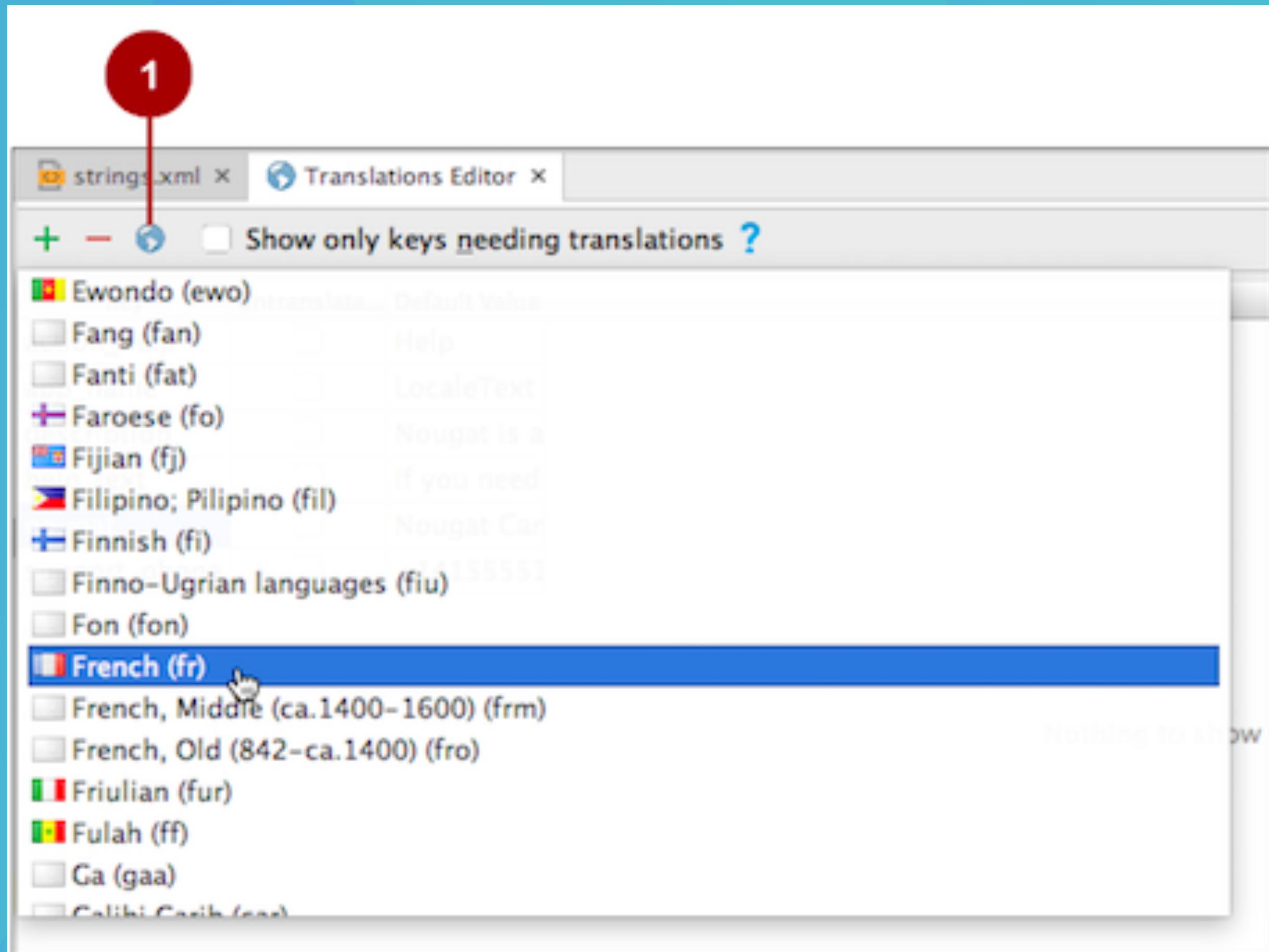
Language Support



Add another language resource to the app



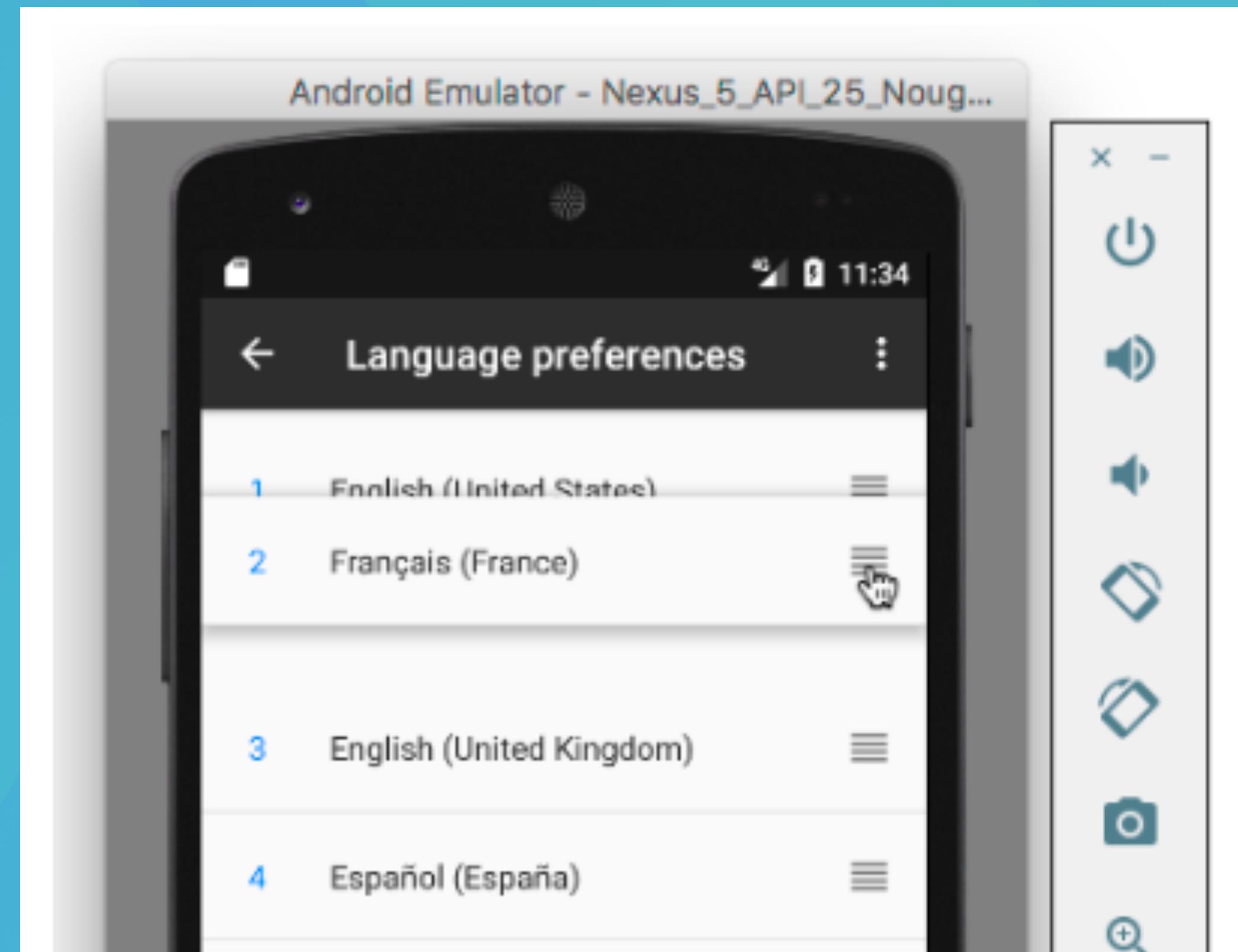
Add another language resource to the app



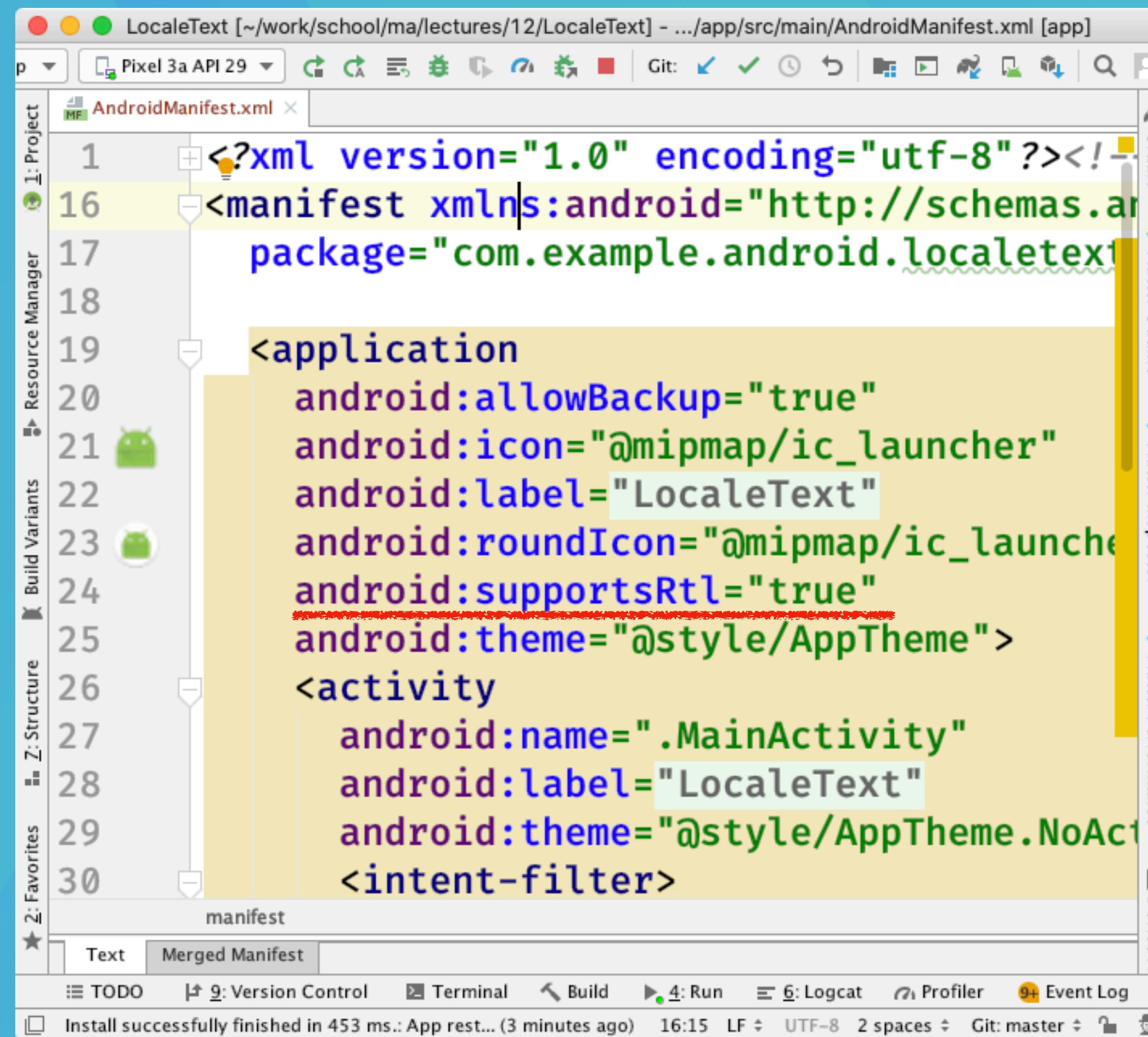
Add another language resource to the app

Key	Untranslatable	Default Value	French (fr)
action_help	<input type="checkbox"/>	Help	Aide
app_name	<input type="checkbox"/>	LocaleText	Texte localisé
description	<input type="checkbox"/>	Nougat is a f	Le nougat est
dial_log_message	<input type="checkbox"/>	Can't resolve	
help_text	<input type="checkbox"/>	If you need h	Si vous avez b
nougat	<input type="checkbox"/>	Nougat Cand	Paquet de bon
support_phone	<input type="checkbox"/>	+141555512	

Run the app and switch languages



Add a right-to-left (RTL) language



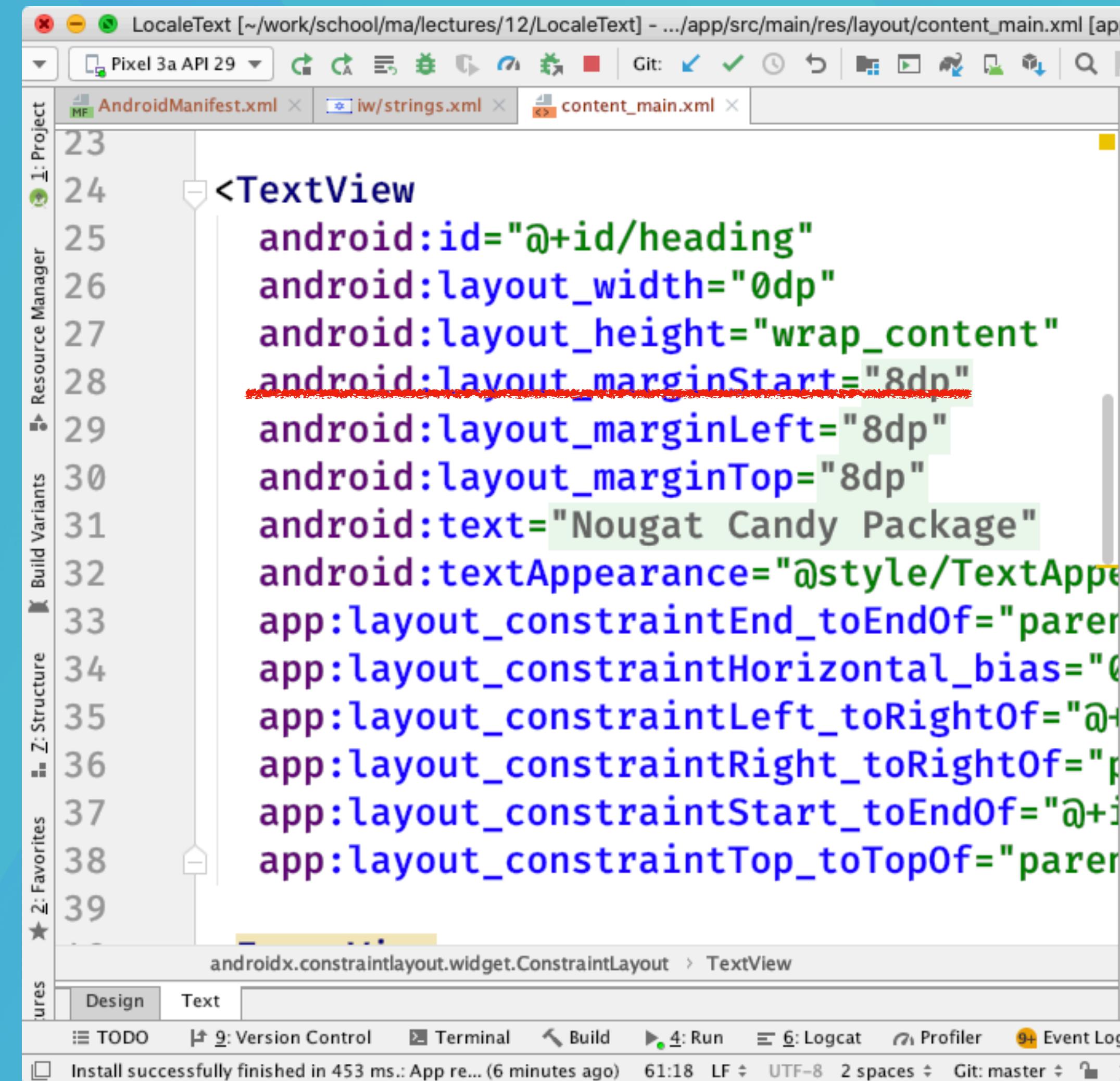
The screenshot shows the AndroidManifest.xml file in the Android Studio editor. The XML code is as follows:

```
<?xml version="1.0" encoding="utf-8"?><!DOCTYPE manifest PUBLIC "-//android//DTD Manifest File 1.0//EN" "http://schemas.android.com/manifest/dtd/manifest_1_0.dtd"><manifest xmlns:android="http://schemas.android.com/apk/res/android" package="com.example.android.localetext" supportsRtl="true">    <application        android:allowBackup="true"        android:icon="@mipmap/ic_launcher"        android:label="LocaleText"        android:roundIcon="@mipmap/ic_launcher_round"        android:theme="@style/AppTheme">        <activity            android:name=".MainActivity"            android:label="LocaleText"            android:theme="@style/AppTheme.NoActionBar">            <intent-filter>
```

The line `android:supportsRtl="true"` is highlighted with a red underline, indicating an error or warning.

DEMO

Add a right-to-left (RTL) language



```
23<TextView  
24    android:id="@+id/heading"  
25    android:layout_width="0dp"  
26    android:layout_height="wrap_content"  
27    android:layout_marginStart="8dp"  
28    android:layout_marginLeft="8dp"  
29    android:layout_marginTop="8dp"  
30    android:text="Nougat Candy Package"  
31    android:textAppearance="@style/TextAppe  
32    app:layout_constraintEnd_toEndOf="parer  
33    app:layout_constraintHorizontal_bias="0  
34    app:layout_constraintLeft_toRightOf="@+  
35    app:layout_constraintRight_toRightOf="P  
36    app:layout_constraintStart_toEndOf="@+i  
37    app:layout_constraintTop_toTopOf="parer  
38    ...  
39
```

The screenshot shows the Android Studio interface with the XML file `content_main.xml` open. The code defines a `TextView` with various attributes. The line `android:layout_marginStart="8dp"` is underlined in red, indicating a potential issue or a point of interest. The XML code is color-coded for syntax highlighting.

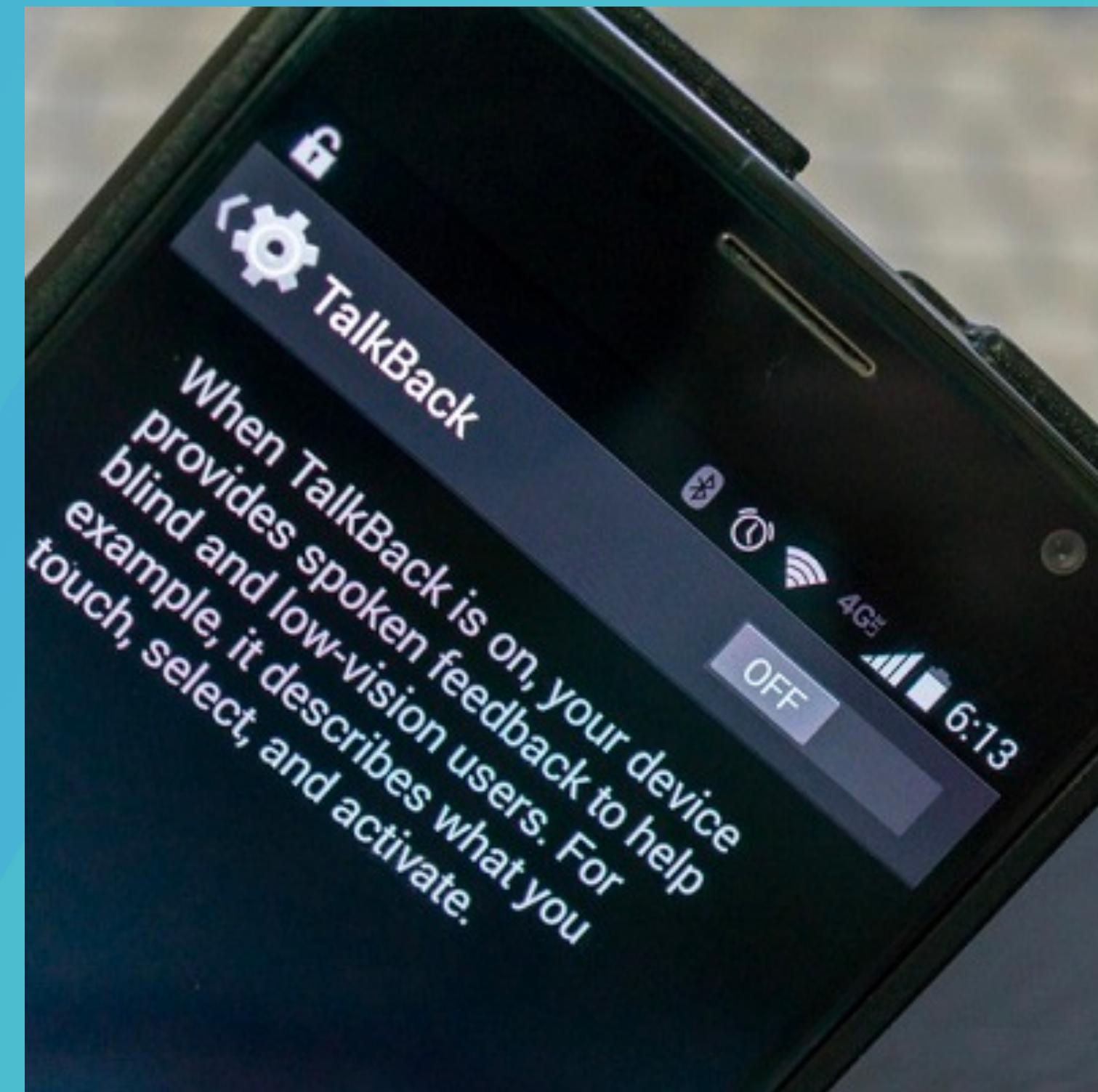
Accessibility

- Blindness
- Low vision.
- Color blindness.
- Deafness or hearing loss.
- Restricted motor skills.



TalkBack

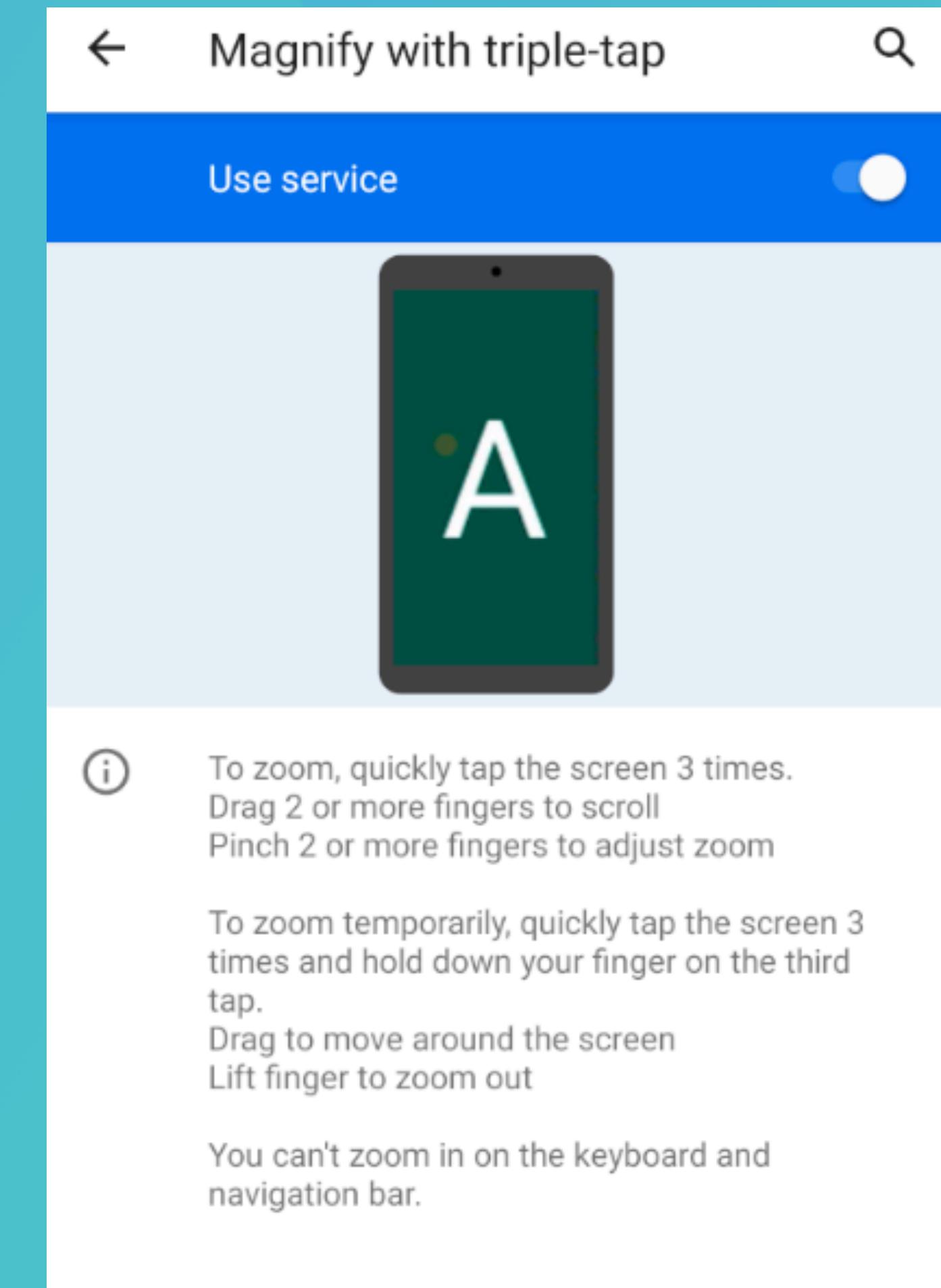
- Settings > Accessibility > TalkBack
- Settings > Accessibility > TalkBack > Settings > Launch TalkBack tutorial.



DEMO

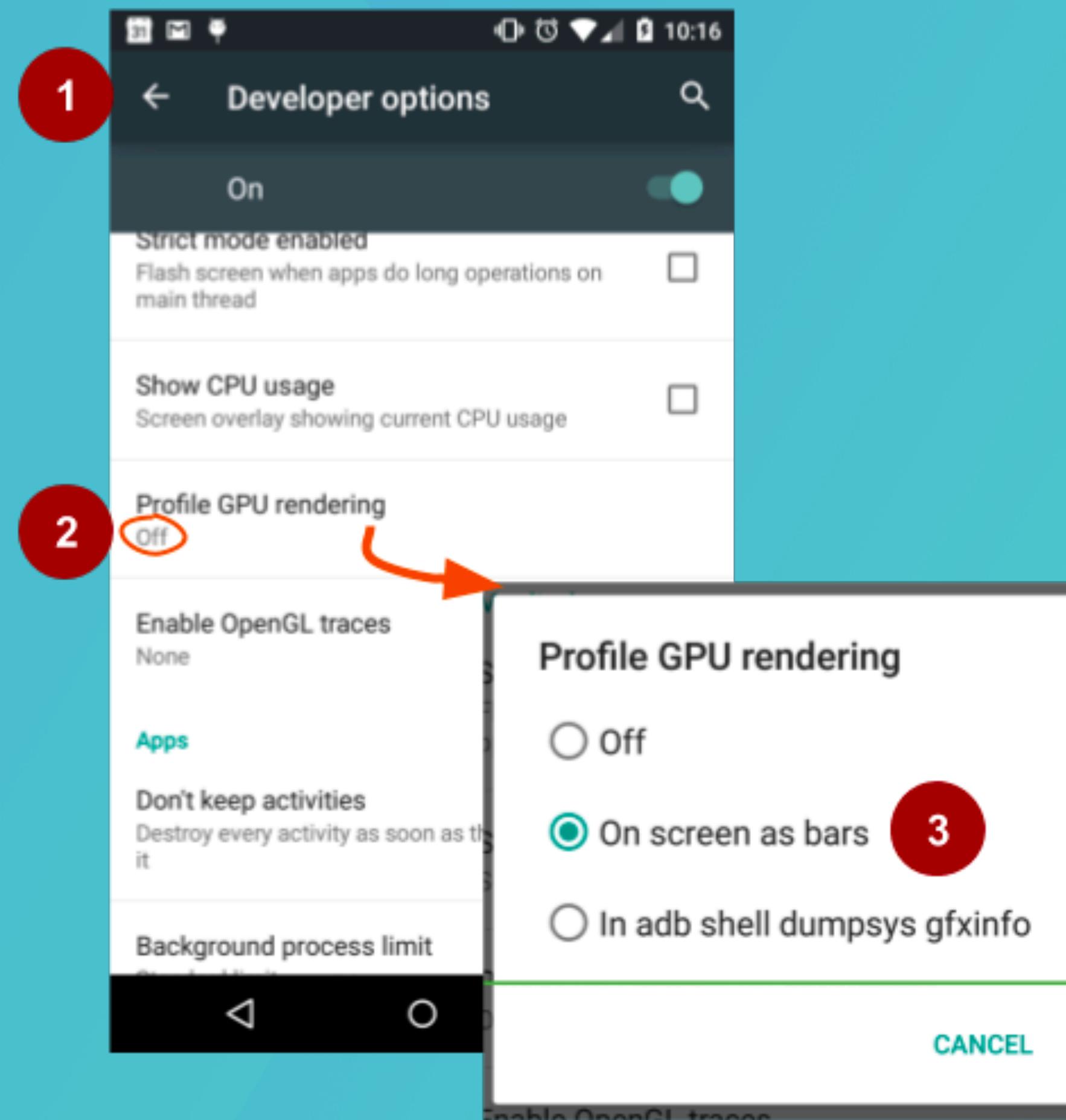
Font and Color

- Settings > Accessibility > Magnification gesture.
- Settings > Accessibility > Font size.
- Settings > Accessibility > High contrast text.



GPU Profiling

- Settings
 - Developer options
 - Monitoring
 - Profile GPU rendering

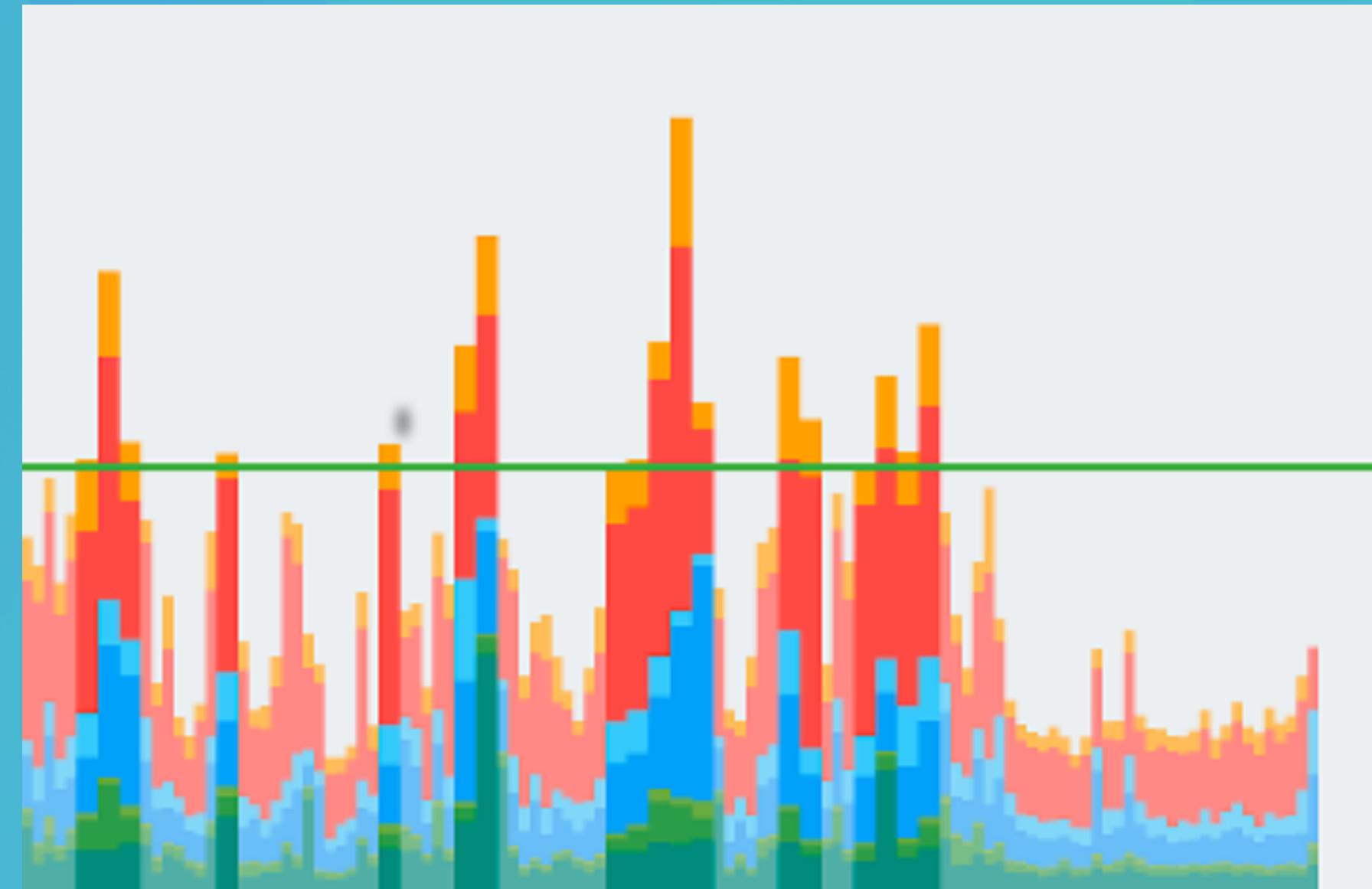


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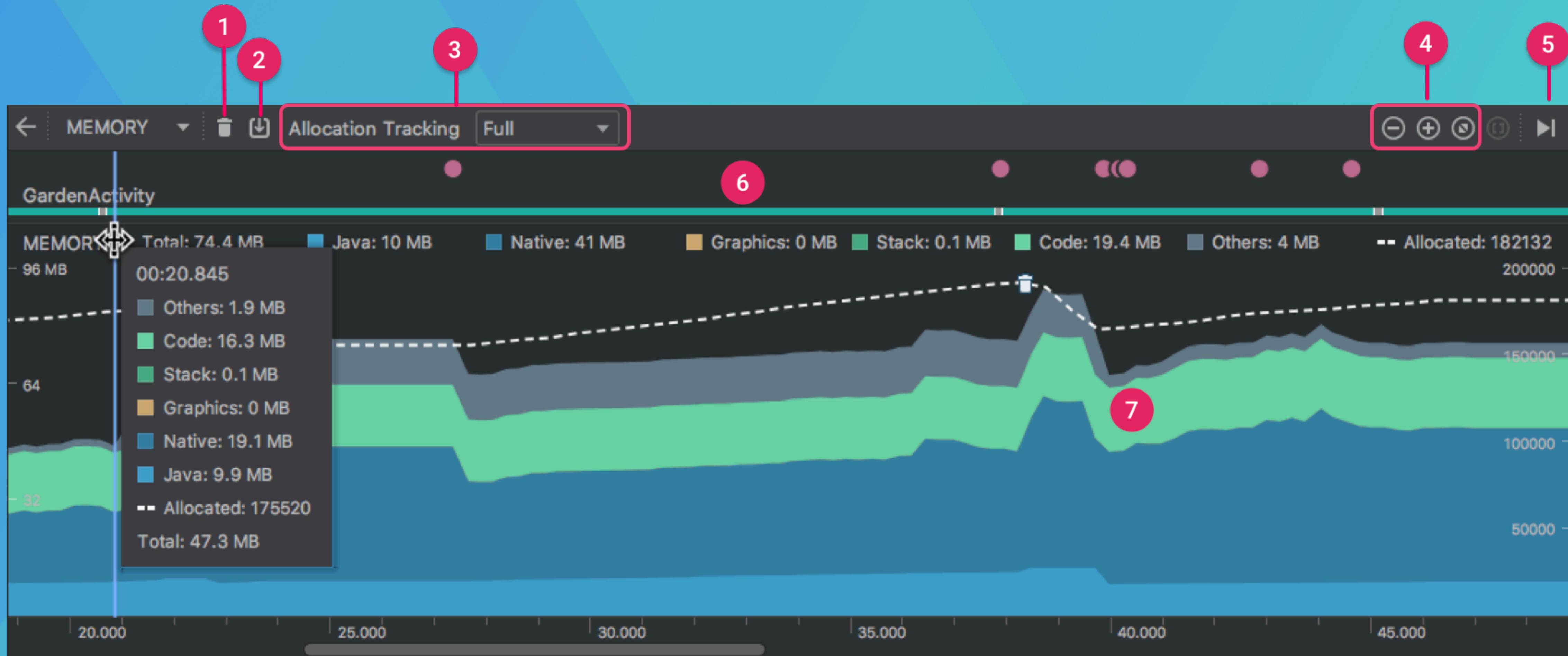
GPU Profiling



Misc Input Anim. Measure Draw Upload Issue Swap

Memory Profiling

DEMO



ViewBinding

```
<?xml version="1.0" encoding="utf-8"?>
<RelativeLayout xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
    android:layout_height="match_parent">

    <TextView
        android:id="@+id/mainTitle"
        tools:text="Main Title" />

    <TextView
        android:id="@+id/subTitle"
        tools:text="Main Subtitle" />
</RelativeLayout>
```

ViewBinding

```
public class MainActivity extends AppCompatActivity {  
    private TextView txtViewMainTitle;  
    private TextView txtViewSubTitle;  
  
    @Override  
    protected void onCreate(@Nullable Bundle savedInstanceState) {  
        super.onCreate(savedInstanceState);  
        setContentView(R.layout.activity_main);  
  
        txtViewMainTitle = findViewById(R.id.mainTitle);  
        txtViewSubTitle = findViewById(R.id.subTitle);  
  
        txtViewMainTitle.setText("This is my main title");  
        txtViewSubTitle.setText("This is my subTitle");  
    }  
}
```

ViewBinding

```
import kotlinx.android.synthetic.main.activity_main.*\n\n\nclass MainActivity : AppCompatActivity() {\n    \n    override fun onCreate(savedInstanceState: Bundle?) {\n        super.onCreate(savedInstanceState)\n        setContentView(R.layout.activity_main)\n\n        mainTitle.text = "This is my main title"\n        subTitle.text = "This is my subTitle"\n    }\n}
```

ViewBinding

Android Open Source Project CHANGES ▾ DOCUMENTATION ▾ BROWSE ▾

Merged as [637b173](#) | [882241](#): Sample updates: Fragment state, synth accessors

Updated	Jan 30, 2019
Owner	Jakub Gielzak
Assignee	
Reviewers	Treehugger Robot Florina Muntenescu Jelle Fresen
CC	Nikita Frukt
Repo	platform/frameworks/support
Branch	androidx-master-dev
Parent	2a9664f
Topic	No topic
Hashtags	

Sample updates: Fragment state, synth accessors

1) Moved click count to Fragment state
This verifies / highlights FragmentStateAdapter's ability to correctly handle Fragment state.

2) Replaced kotlinx synthetic with findViewById
kotlinx.android.synthetic is no longer a recommended practice. Removing in favour of explicit findViewById.

Bug: [122659289](#)
Test: manual

Change-Id: [Ic472f90e28f7133822edcf53f44b83dc333f768e](#)

Code-Review +1 Florina Muntenescu
+2 Jelle Fresen

ViewBinding

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Code-Review +1 Florina Muntenescu
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ViewBinding

The Argument Over Kotlin Synthetics

- They Are Kotlin Only.
- They Don't Expose Nullability.
- The Code Generated Is Not Guaranteed To Be Performant.
- Everything Exists In A Global Namespace.
- Typing Isn't Guaranteed.

ViewBinding

Android Studio 3.6 Canary 11+.

app/build.gradle:

```
android {  
    ...  
    viewBinding {  
        enabled = true  
    }  
}
```

ViewBinding

Android Studio 3.6 Canary 11+.

app/build.gradle:

```
android {  
    ...  
    viewBinding {  
        enabled = true  
    }  
}
```



ViewBinding

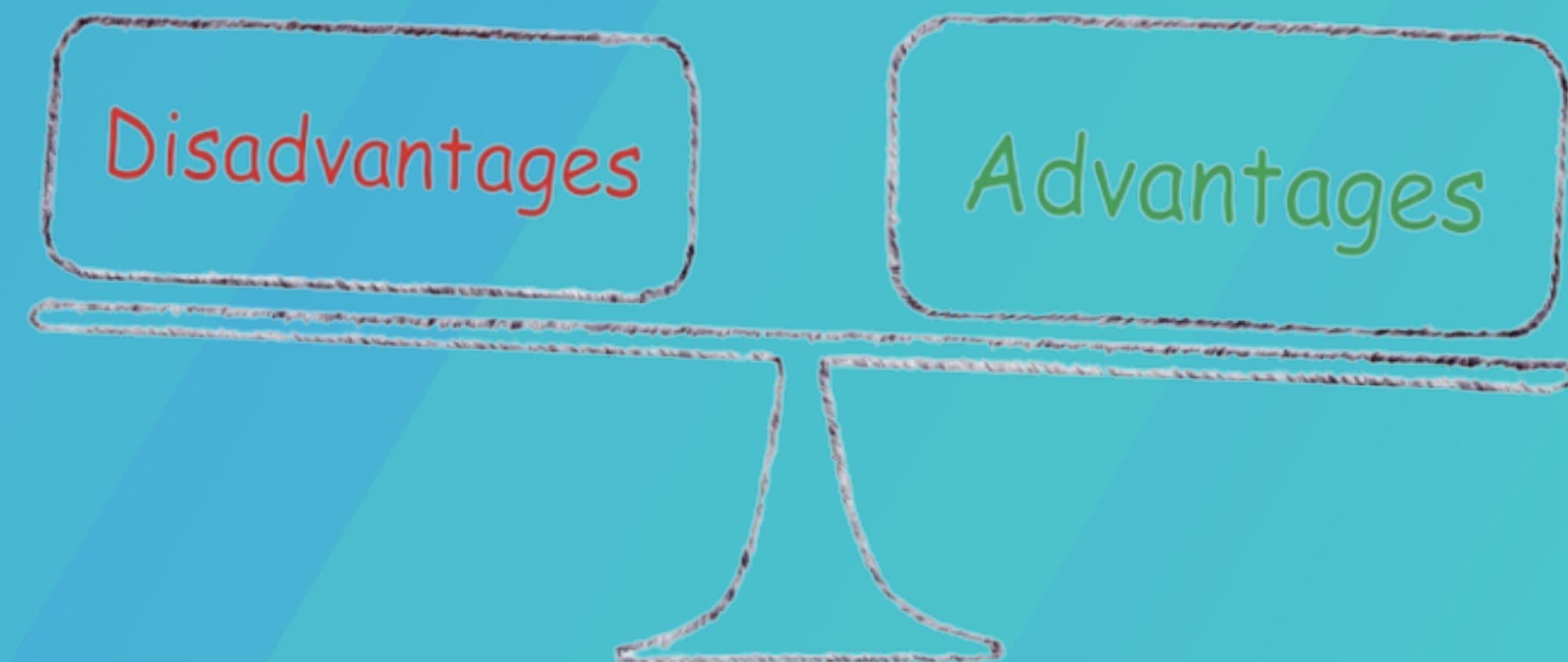
build.gradle:

```
buildscript {  
    ext.kotlin_version = '1.4.10'  
    repositories {  
        google()  
        jcenter()  
  
    }  
    dependencies {  
        classpath "com.android.tools.build:gradle:4.1.1"  
        classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"  
    }  
}
```

DEMO

ViewBinding

- The auto-generated .class increases app size.
- Harder to debug.
- Null safety.
- Type safety.
- Speed.



Lecture outcomes

- Identify app widgets, and understand the key parts of an app widget.
- Implement app widget actions when an element of an app widget is tapped.
- Add support for different languages.
- Test your app for accessibility in a variety of ways.
- Use the Profile GPU Rendering tool to visualize Android drawing the screen.
- Use Memory Profiler to collect data about your app.

