

Get started with Android Development



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hack.athon.uk

What makes up an Android app?



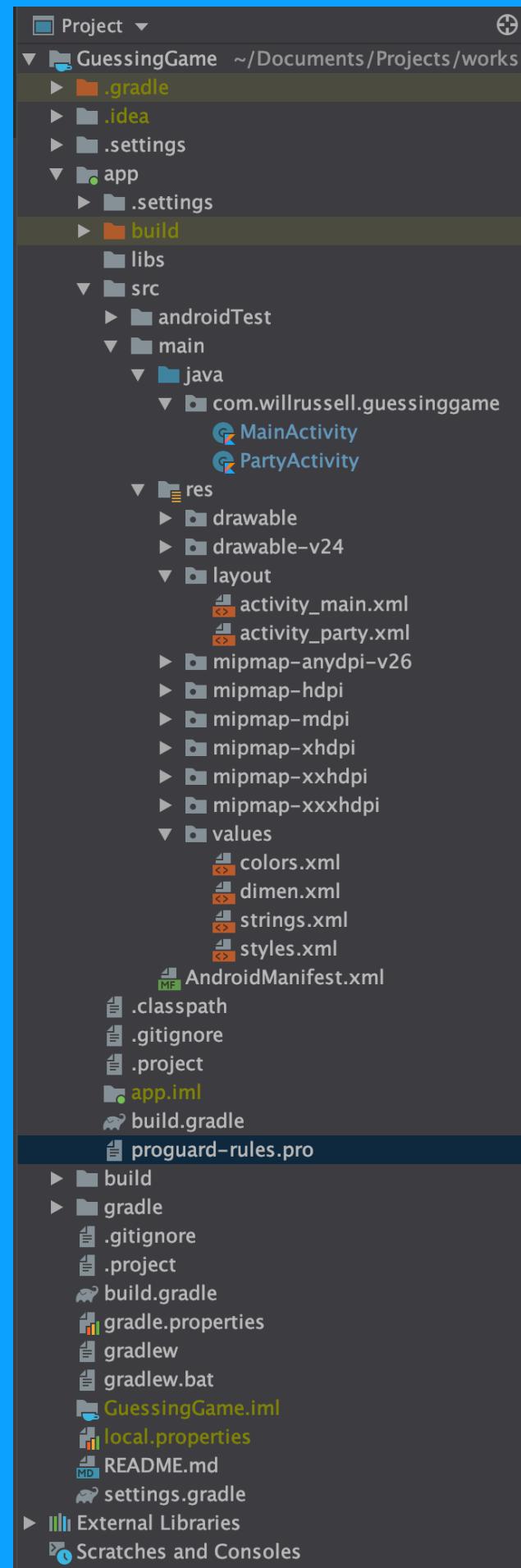


```
<?xml version="1.0"?>
<quiz>
<qanda seq="1">
<question>
    Who was the forty-second
    president of the U.S.A.?
</question>
<answer>
    William Jefferson Clinton
</answer>
</qanda>
<!-- Note: We need to add
      more questions later.-->
</quiz>
```

XML



Project Structure



project-name

└── build.gradle

app

└── build.gradle

src

└── main

 └── AndroidManifest.xml

 └── java

 └── com

 └── willrussell

 └── guessinggame

 └── res

 └── drawables
 └── layout
 └── menu
 └── styles

Code!

XML!

Let's start at the top

build.gradle

app

app

build.gradle

src

src/main

AndroidManifest.xml

java

res

AndroidManifest.xml

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <manifest xmlns:android="http://schemas.android.com/apk/res/android"
3      package="com.willrussell.guessinggame">
4
5      <application
6          android:allowBackup="true"
7          android:icon="@mipmap/ic_launcher"
8          android:label="@string/app_name"
9          android:roundIcon="@mipmap/ic_launcher_round"
10         android:supportsRtl="true"
11         android:theme="@style/AppTheme">
12             <activity android:name=".PartyActivity"></activity>
13             <activity android:name=".MainActivity">
14                 <intent-filter>
15                     <action android:name="android.intent.action.MAIN" />
16
17                     <category android:name="android.intent.category.LAUNCHER" />
18                 </intent-filter>
19             </activity>
20         </application>
21
22     </manifest>
```

java

```
1 package com.willrussell.guessinggame
2
3 import androidx.appcompat.app.AppCompatActivity
4 import android.os.Bundle
5 import android.view.View
6
7 class PartyActivity : AppCompatActivity() {
8
9     override fun onCreate(savedInstanceState: Bundle?) {
10         super.onCreate(savedInstanceState)
11         setContentView(R.layout.activity_party)
12     }
13
14     fun tryAgain(v: View) {
15         finish() // Finish the activity
16     }
17 }
```

res

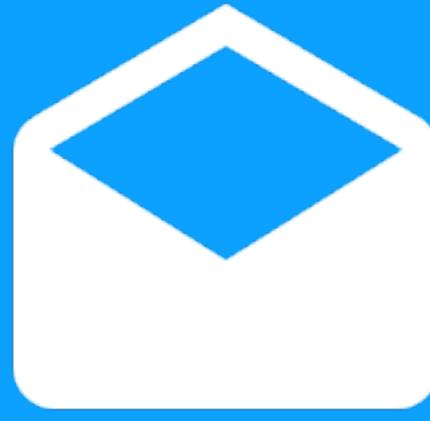
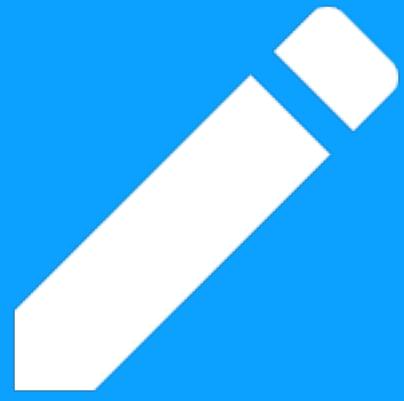
drawable

layout

menu

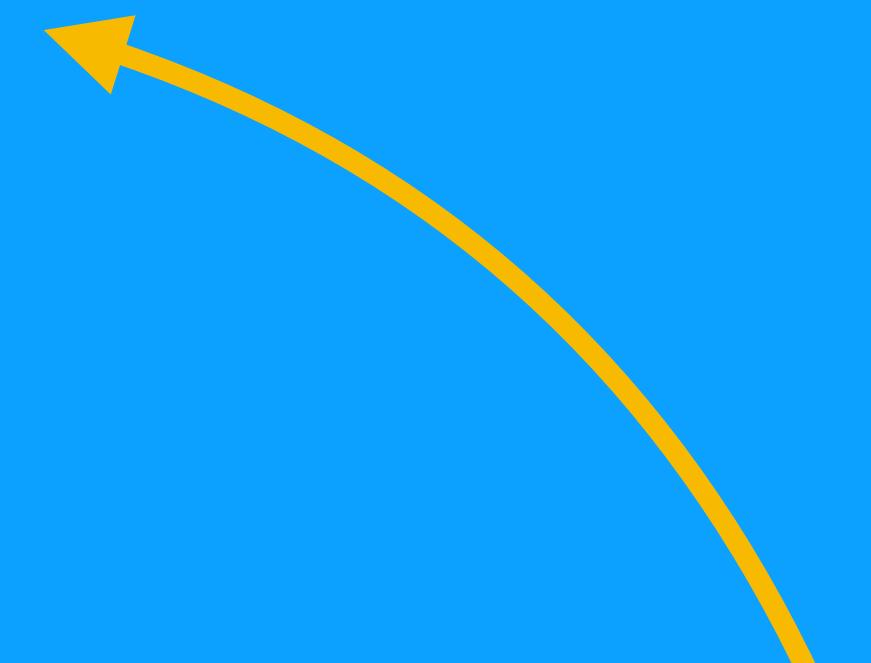
values

drawable



layout

```
<TextView  
    android:id="@+id/number_view"  
    android:layout_width="wrap_content"  
    android:layout_height="wrap_content"  
    android:text="@string/guess_label"  
    android:textColor="@android:color/black"  
    android:textSize="@dimen/title_size"  
    app:layout_constraintBottom_toTopOf="@+id/user_input"  
    app:layout_constraintLeft_toLeftOf="parent"  
    app:layout_constraintRight_toRightOf="parent"  
    app:layout_constraintTop_toTopOf="parent" />
```



View

menu

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <menu xmlns:android="http://schemas.android.com/apk/res/android"
3      xmlns:app="http://schemas.android.com/apk/res-auto"
4      xmlns:tools="http://schemas.android.com/tools"
5      tools:context="com.will_russell.hackathon_demo_timer_android.MainActivity">
6
7      <item
8          android:id="@+id/action_countdown"
9          android:orderInCategory="100"
10         android:title="@string/countdown_mode"
11         app:showAsAction="never" />
12     <item
13         android:id="@+id/action_time"
14         android:orderInCategory="200"
15         android:title="@string/time_mode"
16         app:showAsAction="never" />
17     <item
18         android:id="@+id/action_about"
19         android:orderInCategory="300"
20         android:title="@string/title_activity_about_activity"
21         app:showAsAction="never" />
22 </menu>
```

values

colors.xml

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <resources>
3   <color name="colorPrimary">#008577</color>
4   <color name="colorPrimaryDark">#00574B</color>
5   <color name="colorAccent">#D81B60</color>
6 </resources>
```

dimen.xml

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <resources>
3   <dimen name="input_margin">32dp</dimen>
4   <dimen name="title_size">36dp</dimen>
5 </resources>
```

strings.xml

```
1 <resources>
2   <string name="app_name">Guessing Game</string>
3   <string name="guess_label">Guess a number</string>
4   <string name="guess_correct_label">You guessed correctly!</string>
5   <string name="guess_incorrect_label">You guessed incorrectly!</string>
6   <string name="submit_button">Submit</string>
7   <string name="try_again">Try again?</string>
8 </resources>
```

styles.xml

```
1 <resources>
2
3   <style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
4     <item name="colorPrimary">@color/colorPrimary</item>
5     <item name="colorPrimaryDark">@color/colorPrimaryDark</item>
6     <item name="colorAccent">@color/colorAccent</item>
7   </style>
8
9 </resources>
```

colors.xml

```
1 <?xml version="1.0" encoding="utf-8"?>
2 <resources>
3     <color name="colorPrimary">#008577</color>
4     <color name="colorPrimaryDark">#00574B</color>
5     <color name="colorAccent">#D81B60</color>
6 </resources>
```

dimen.xml

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <resources>
3      <dimen name="input_margin">32dp</dimen>
4      <dimen name="title_size">36dp</dimen>
5  </resources>
```

strings.xml

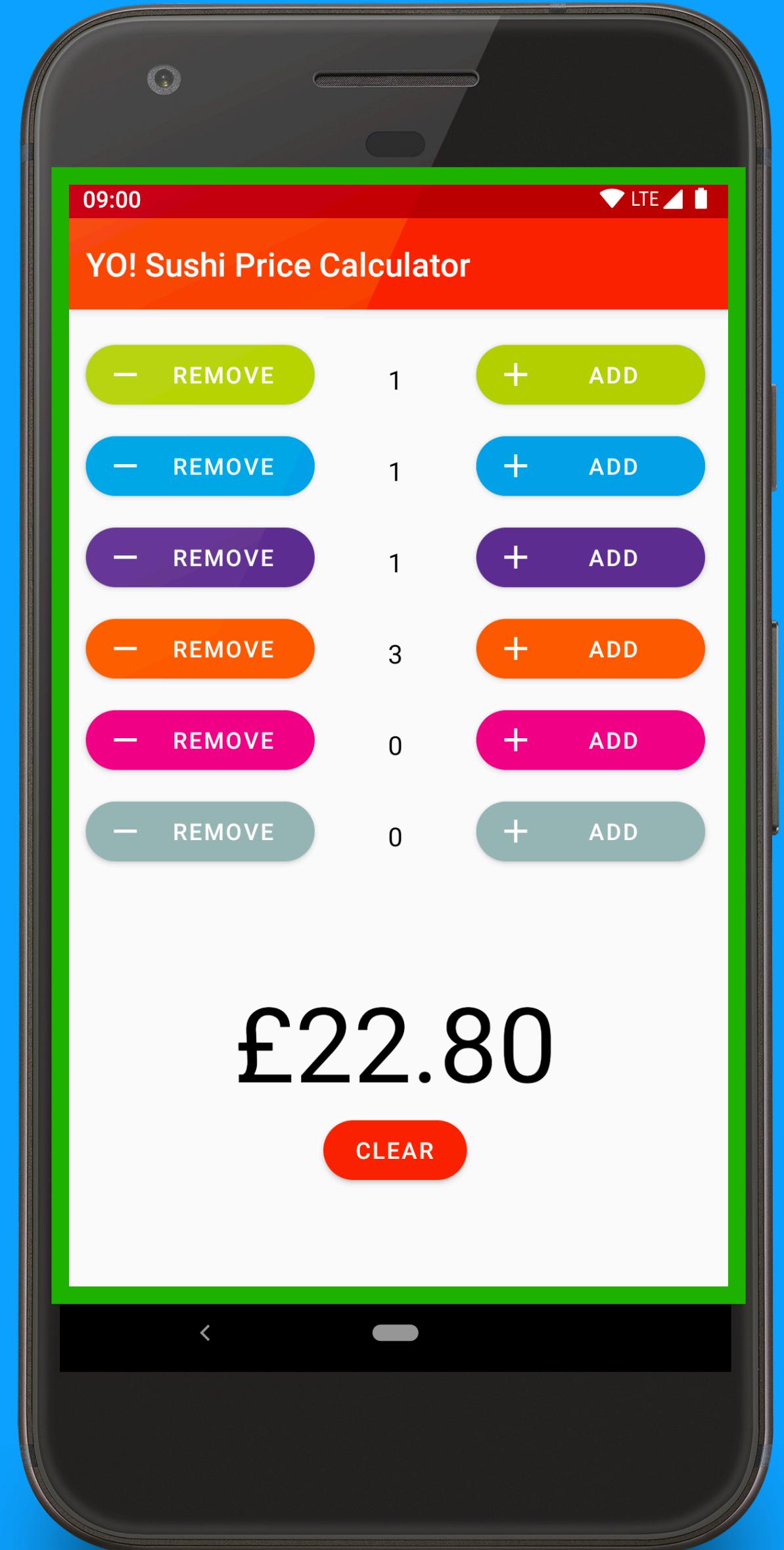
```
1 <resources>
2     <string name="app_name">Guessing Game</string>
3     <string name="guess_label">Guess a number</string>
4     <string name="guess_correct_label">You guessed correctly!</string>
5     <string name="guess_incorrect_label">You guessed incorrectly!</string>
6     <string name="submit_button">Submit</string>
7     <string name="try_again">Try again?</string>
8 </resources>
```

styles.xml

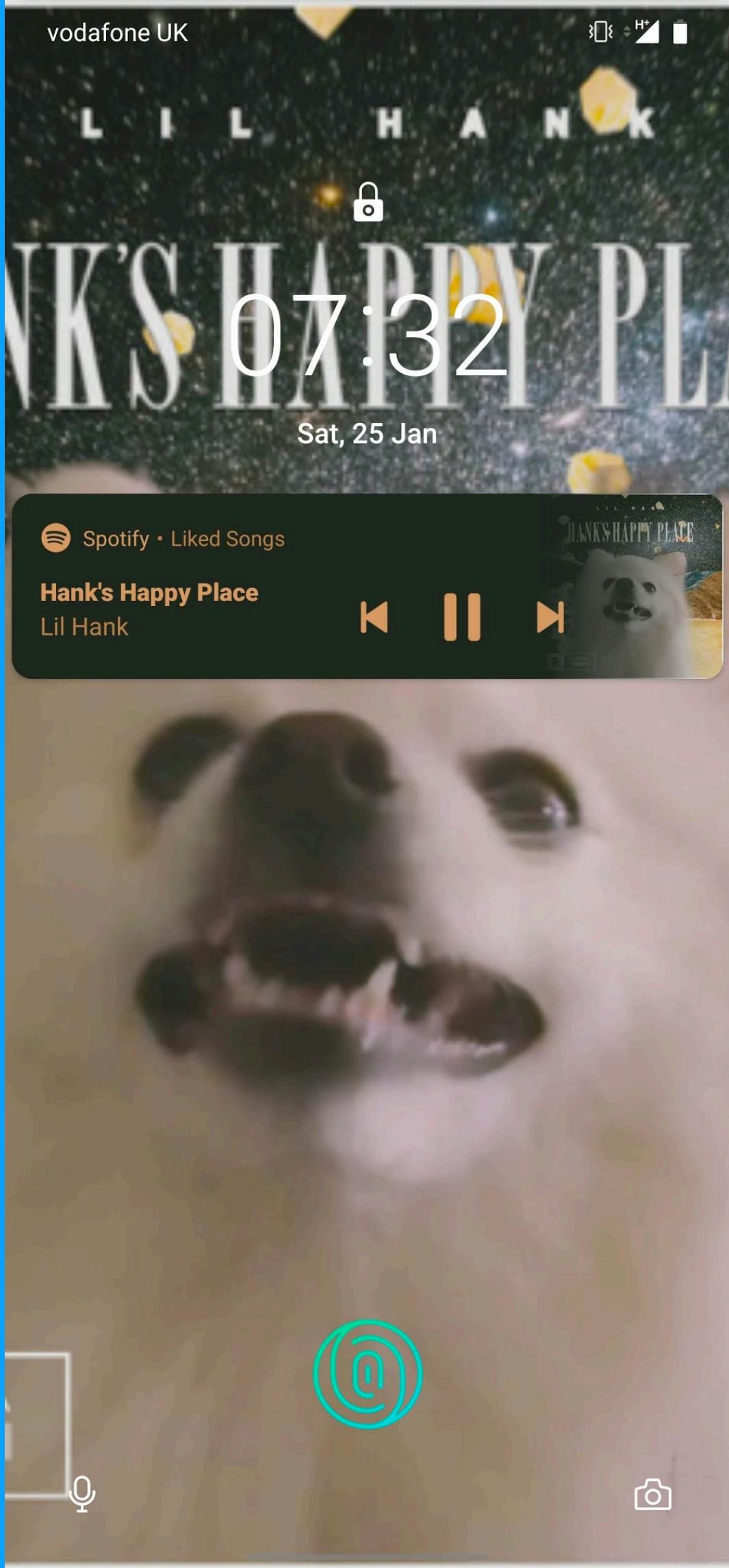
```
1 <resources>
2
3     <style name="AppTheme" parent="Theme.AppCompat.Light.DarkActionBar">
4         <item name="colorPrimary">@color/colorPrimary</item>
5         <item name="colorPrimaryDark">@color/colorPrimaryDark</item>
6         <item name="colorAccent">@color/colorAccent</item>
7     </style>
8
9 </resources>
```

Components

1. Activities



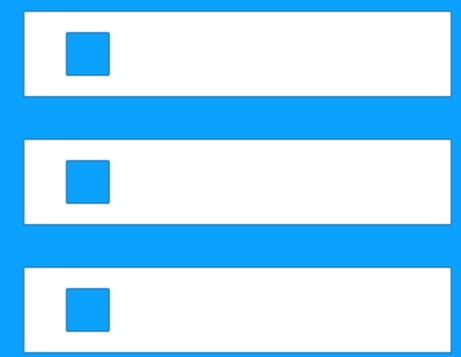
2. Services



3. Broadcast Receivers



4. Content Providers



Using Components

Intents

Intents

```
val intent = Intent(this, PartyActivity::class.java)
```

User Interface

```
1  <?xml version="1.0" encoding="utf-8"?>
2  <androidx.constraintlayout.widget.ConstraintLayout
3      xmlns:android="http://schemas.android.com/apk/res/android"
4      xmlns:app="http://schemas.android.com/apk/res-auto"
5      xmlns:tools="http://schemas.android.com/tools"
6      android:layout_width="match_parent"
7      android:layout_height="match_parent"
8      tools:context=".MainActivity">
9
10     <TextView
11         android:id="@+id/number_view"
12         android:layout_width="wrap_content"
13         android:layout_height="wrap_content"
14         android:text="@string/guess_label"
15         android:textColor="@android:color/black"
16         android:textSize="@dimen/title_size"
17         app:layout_constraintBottom_toTopOf="@id/user_input"
18         app:layout_constraintLeft_toLeftOf="parent"
19         app:layout_constraintRight_toRightOf="parent"
20         app:layout_constraintTop_toTopOf="parent" />
21
22     <EditText
23         android:id="@+id/user_input"
24         android:layout_width="match_parent"
25         android:layout_height="wrap_content"
26         android:layout_margin="@dimen/input_margin"
27         app:layout_constraintBottom_toBottomOf="@id/submit_button"
28         app:layout_constraintLeft_toLeftOf="parent"
29         app:layout_constraintRight_toRightOf="parent"
30         app:layout_constraintTop_toBottomOf="@+id/number_view"
31         android:inputType="number" />
32
33     <Button
34         android:id="@+id/submit_button"
35         android:layout_width="wrap_content"
36         android:layout_height="wrap_content"
37         app:layout_constraintTop_toTopOf="@+id/user_input"
38         app:layout_constraintLeft_toLeftOf="parent"
39         app:layout_constraintRight_toRightOf="parent"
40         app:layout_constraintBottom_toBottomOf="parent"
41         android:text="@string/submit_button"
42         android:onClick="checkGuess" />
43
44 </androidx.constraintlayout.widget.ConstraintLayout>
```

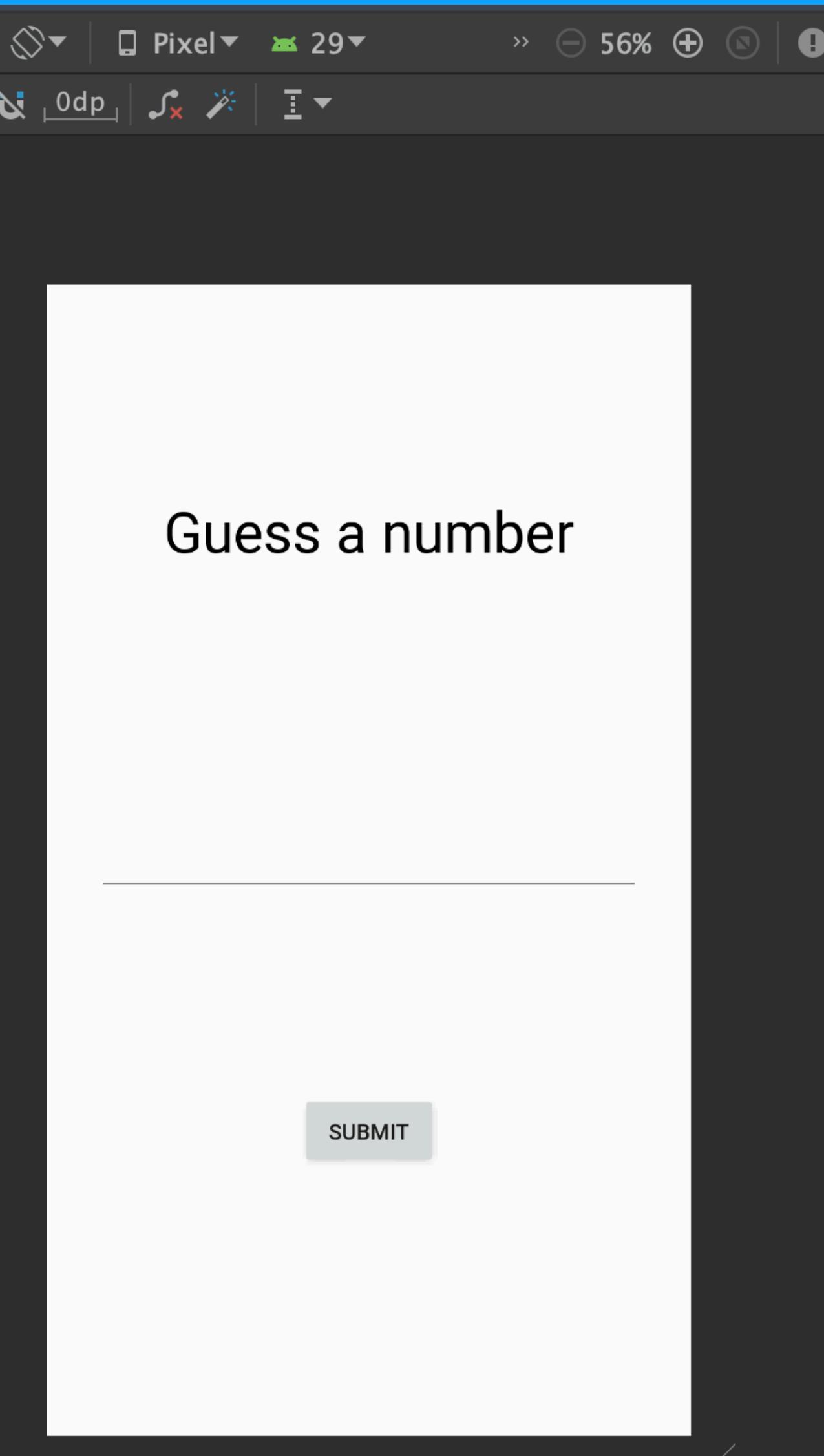
```
<?xml version="1.0" encoding="utf-8"?>
<androidx.constraintlayout.widget.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"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

    <TextView
        android:id="@+id/number_view"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:text="Guess a number"
        android:textColor="@android:color/black"
        android:textSize="36dp"
        app:layout_constraintBottom_toTopOf="@+id/user_input"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toTopOf="parent" />

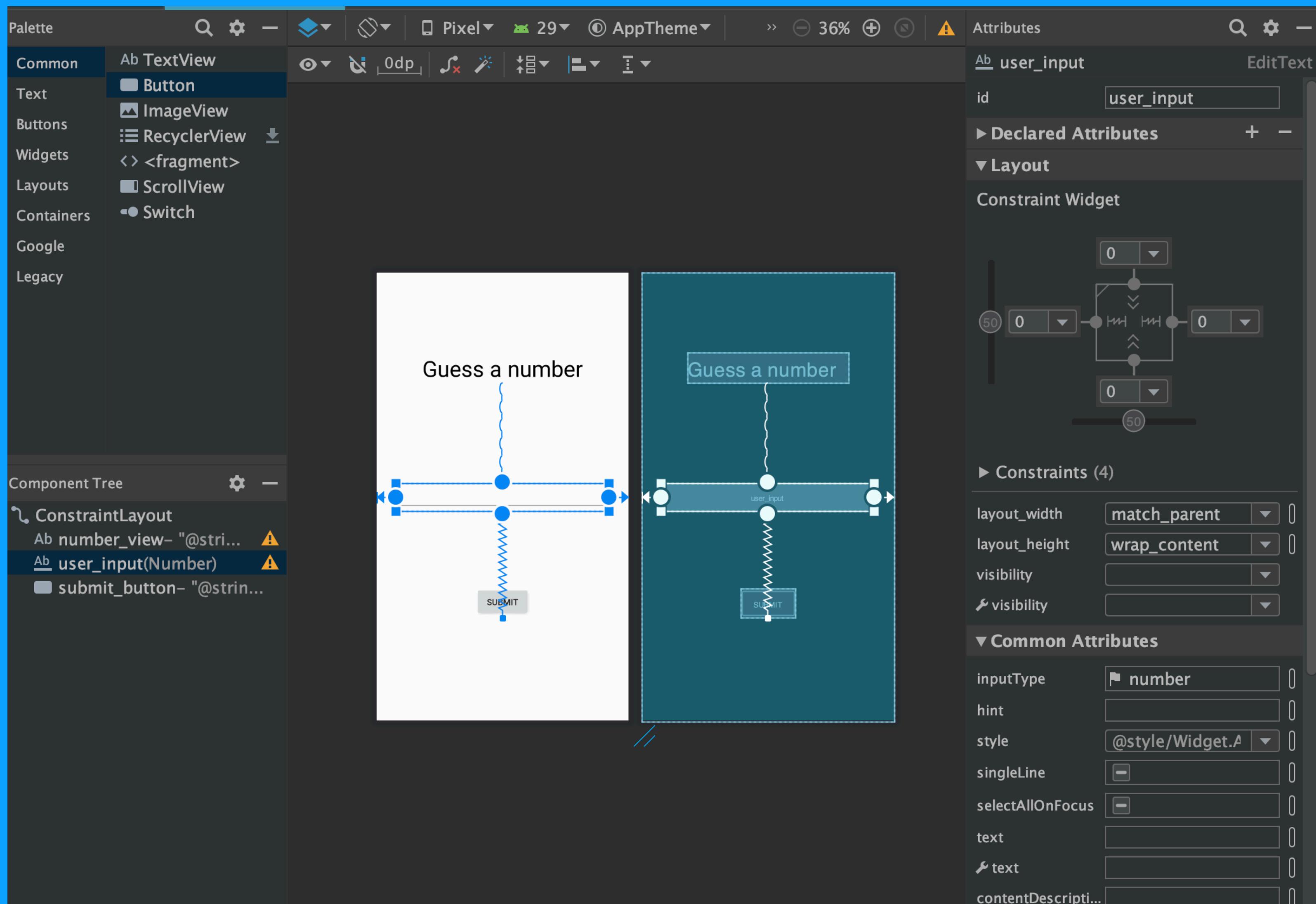
    <EditText
        android:id="@+id/user_input"
        android:layout_width="match_parent"
        android:layout_height="wrap_content"
        android:layout_margin="32dp"
        app:layout_constraintBottom_toBottomOf="@+id/submit_button"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintTop_toBottomOf="@+id/number_view"
        android:inputType="number" />

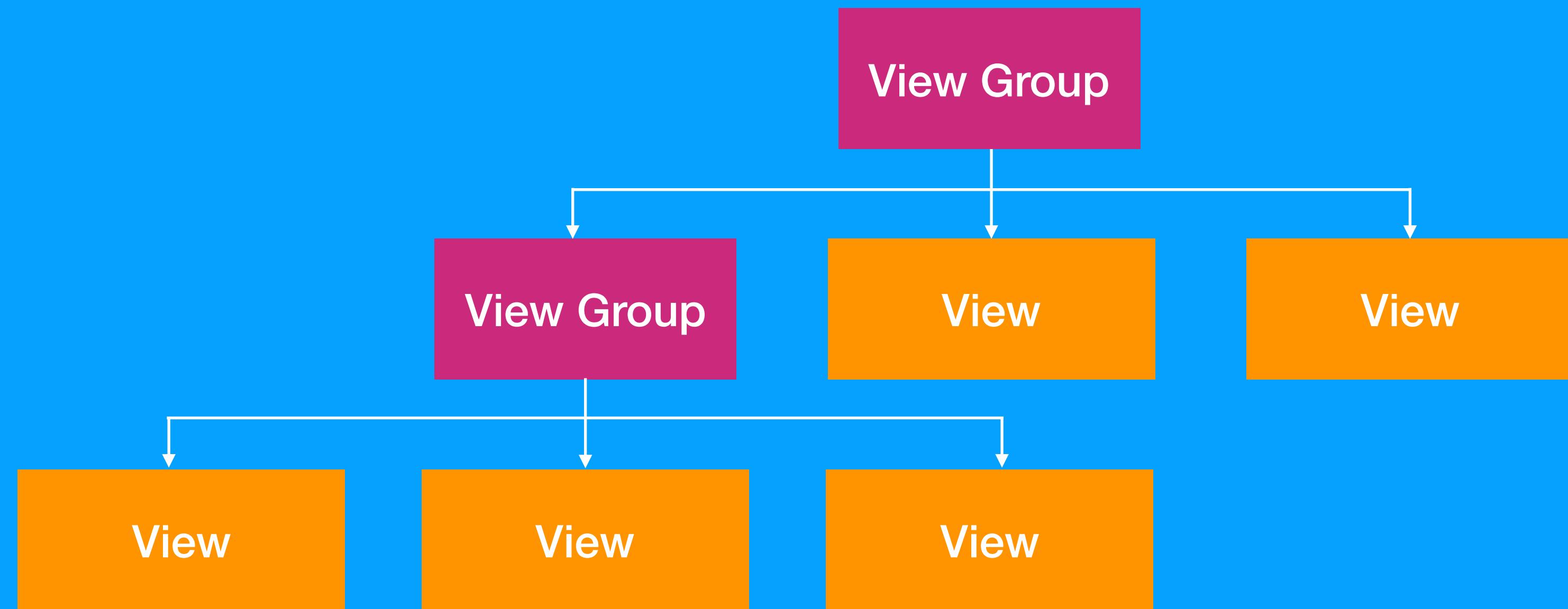
    <Button
        android:id="@+id/submit_button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        app:layout_constraintTop_toBottomOf="@+id/user_input"
        app:layout_constraintLeft_toLeftOf="parent"
        app:layout_constraintRight_toRightOf="parent"
        app:layout_constraintBottom_toBottomOf="parent"
        android:text="Submit"
        android:onClick="checkGuess" />

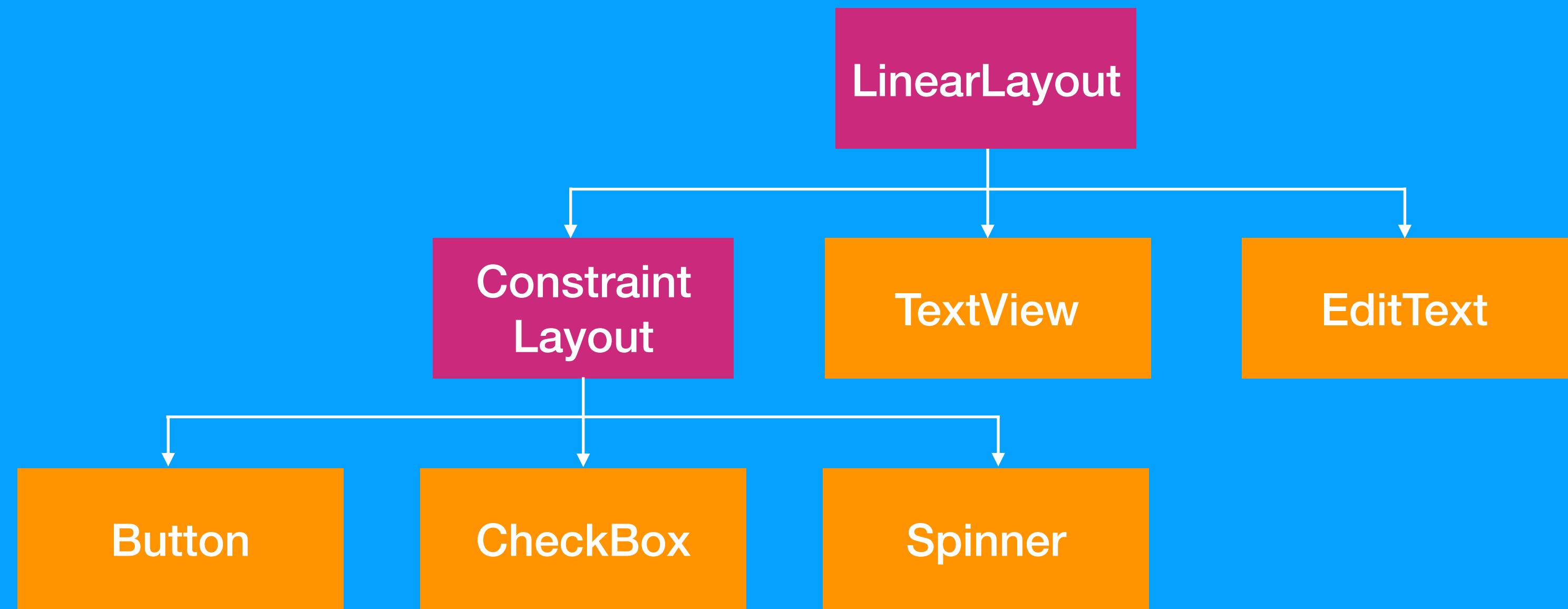
</androidx.constraintlayout.widget.ConstraintLayout>
```



The screenshot shows the Android Studio interface with the XML code for a layout file. The XML defines a ConstraintLayout containing a TextView, an EditText, and a Button. The TextView has the text "Guess a number". The EditText is labeled "user_input" and has an input type of "number". The Button is labeled "submit_button" and has an onClick event set to "checkGuess". The right side of the screen shows a preview of the layout with the text "Guess a number" and a "SUBMIT" button.







Time to make our own app!

