CSc 317
Android App Basics

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Announcements

- FYI: Readings and topics could change!
- PA due next week
- Discord?
- Office hours
- Quiz
- How to compress your project

    File -> Export

Java or Kotlin?

- Java vs Kotlin
- Kotlin is the officially preferred Android Dev language
- May use if you want to learn the new syntax
- In class will mostly stick to Java

MyFirstApp Prep

- As a part of your first reading, you’ll create a simple app
    - Do the readings!
- We will go through some of the basics today

MyFirstApp

- Install Android Studio
- Create a new app (empty activity, Java)

MyFirstApp

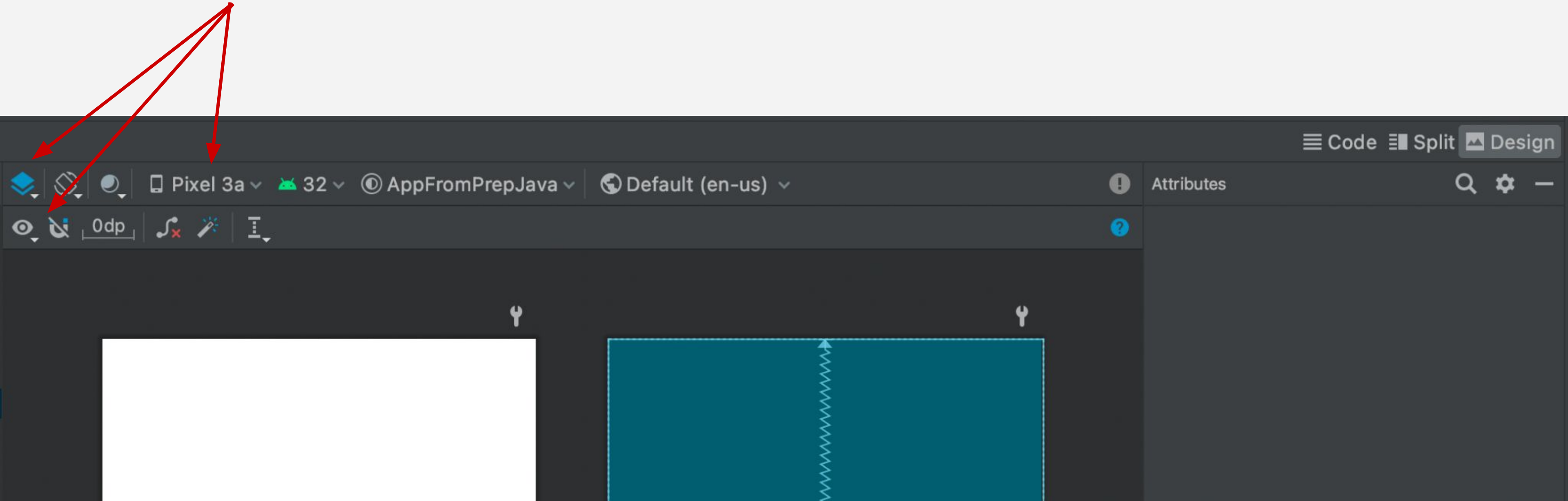
- Let’s inspect a few files:
  - `MainActivity.java`
  - `Activity_main.xml (text)`
  - `AndroidManifest.xml`
  - `build.gradle`
- Will be using java + xml heavily

Run the app in the emulator

- What are emulators?
- Can create one for simulating various devices

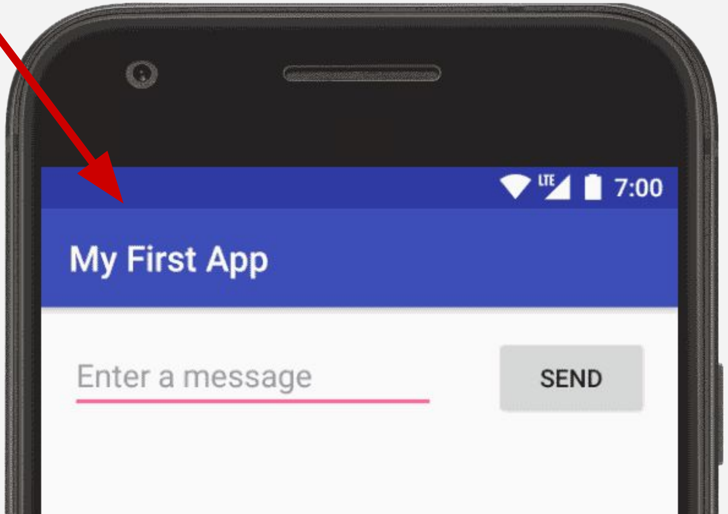
Modify the UI with the GUI

- Click on activity_main.xml
- See Code view and Design view
- Configure some settings



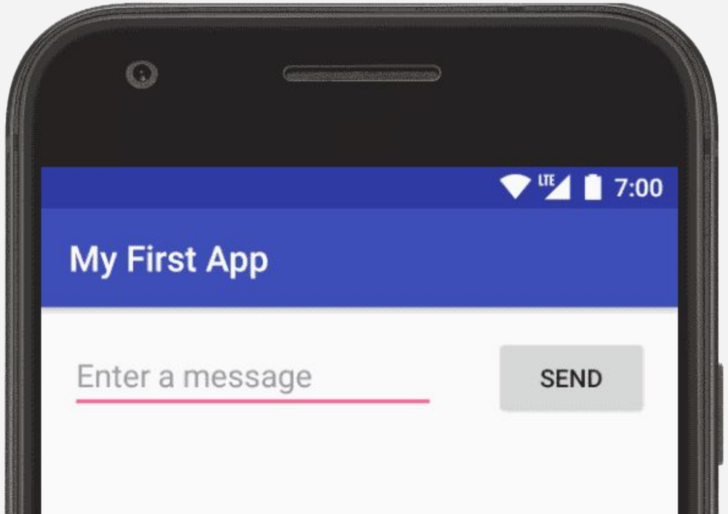
MyFirstApp

- Make the app look like this
- Add a plain text and a button
- Then, change so that it starts a new page (activity) when the button is clicked with the text from the plaintext displayed



MyFirstApp

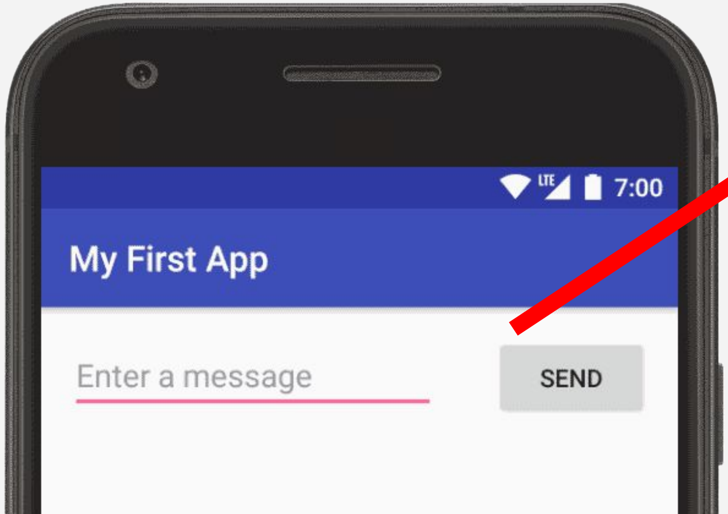
- The instructions showed you how to build the UI via GUI
- Let’s look at what happened in the XML

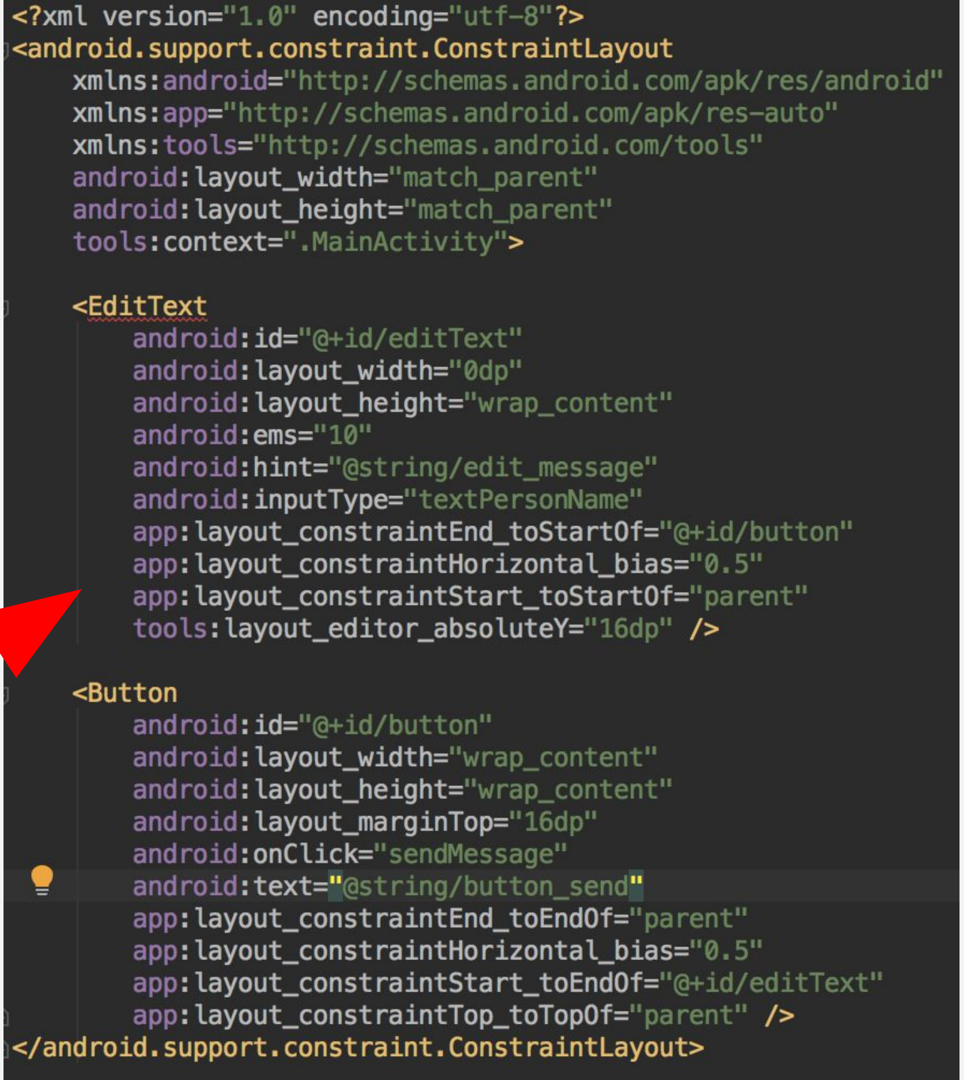


Activities

- For each activity that was created, two main files:
  - The java class file
  - The layout file

MyFirstApp





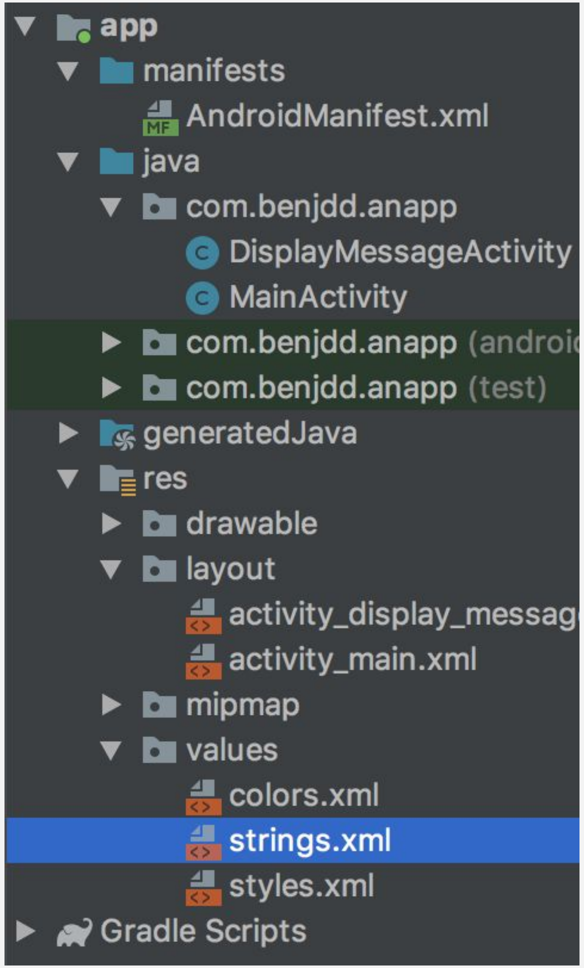
```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
  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

    <EditText
        android:id="@+id/editText"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="@string/edit_message"
        android:inputType="textPersonName"
        app:layout_constraintEnd_toStartOf="@+id/button"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        tools:layout_editor_absoluteY="16dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:onClick="sendMessage"
        android:text="@string/button_send"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/editText"
        app:layout_constraintTop_toTopOf="parent" />
</android.support.constraint.ConstraintLayout>
```

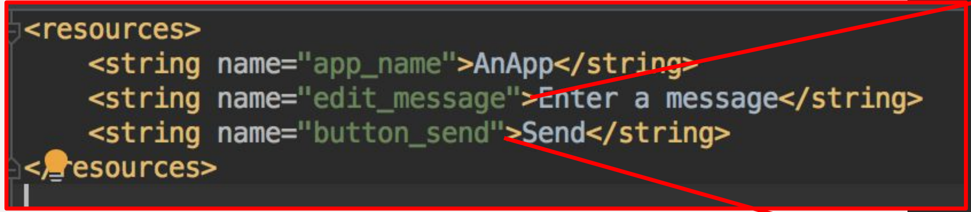
MyFirstApp

- When you created the string resources, they were actually added to the strings.xml file.
- To add resources to an android program, add them to a directory or XML file in the **res** dir

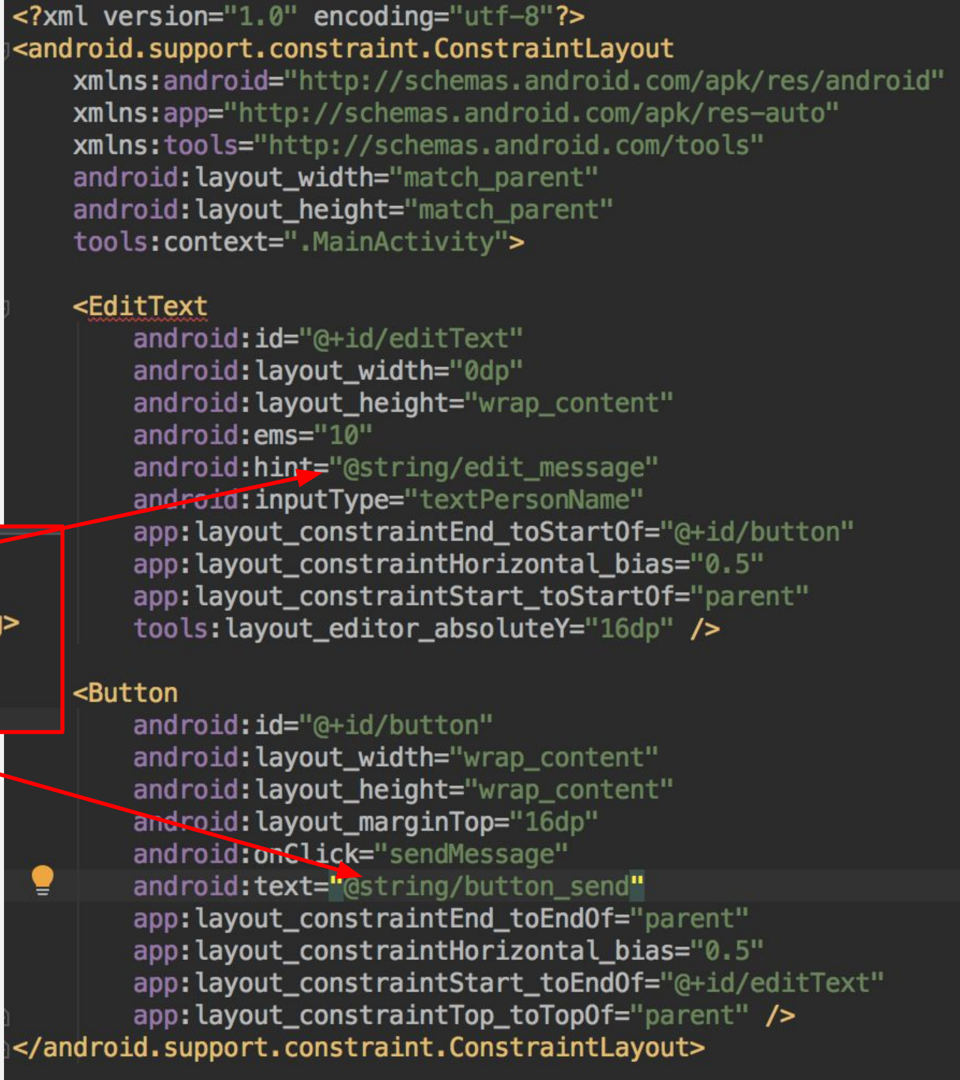


```
▼ app
  ▼ manifests
      AndroidManifest.xml
  ▼ java
    ▼ com.benjdd.anapp
        DisplayMessageActivity
        MainActivity
    ▶ com.benjdd.anapp (androi
    ▶ com.benjdd.anapp (test)
  ▶ generatedJava
  ▼ res
    ▶ drawable
    ▼ layout
        activity_display_messag
        activity_main.xml
    ▶ mipmap
    ▼ values
        colors.xml
        strings.xml
        styles.xml
▶ Gradle Scripts
```

MyFirstApp



```
<resources>
    <string name="app_name">AnApp</string>
    <string name="edit_message">Enter a message</string>
    <string name="button_send">Send</string>
</resources>
```



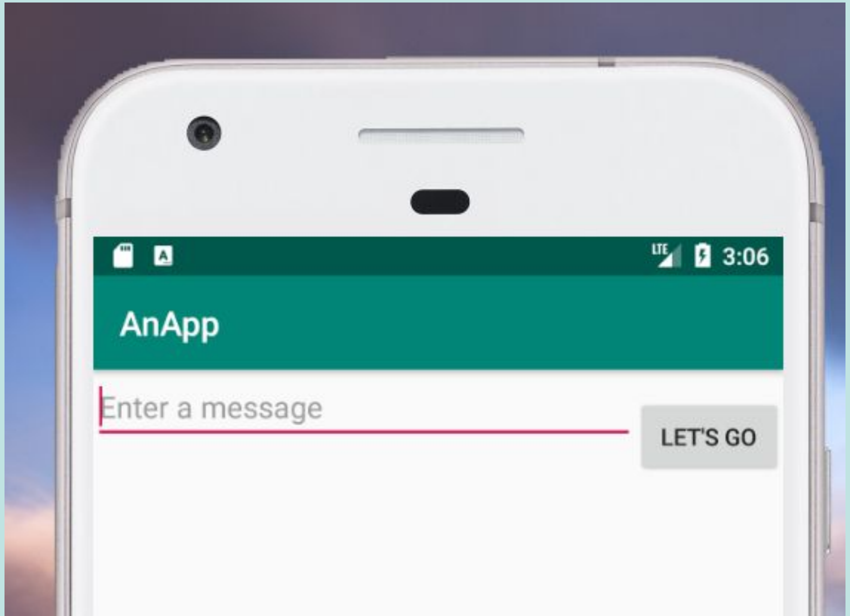
```
<?xml version="1.0" encoding="utf-8"?>
<android.support.constraint.ConstraintLayout
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:app="http://schemas.android.com/apk/res-auto"
    xmlns:tools="http://schemas.android.com/tools"
    android:layout_width="match_parent"
  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

    <EditText
        android:id="@+id/editText"
        android:layout_width="0dp"
        android:layout_height="wrap_content"
        android:ems="10"
        android:hint="@string/edit_message"
        android:inputType="textPersonName"
        app:layout_constraintEnd_toStartOf="@+id/button"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toStartOf="parent"
        tools:layout_editor_absoluteY="16dp" />

    <Button
        android:id="@+id/button"
        android:layout_width="wrap_content"
        android:layout_height="wrap_content"
        android:layout_marginTop="16dp"
        android:onClick="sendMessage"
        android:text="@string/button_send"
        app:layout_constraintEnd_toEndOf="parent"
        app:layout_constraintHorizontal_bias="0.5"
        app:layout_constraintStart_toEndOf="@+id/editText"
        app:layout_constraintTop_toTopOf="parent" />
</android.support.constraint.ConstraintLayout>
```

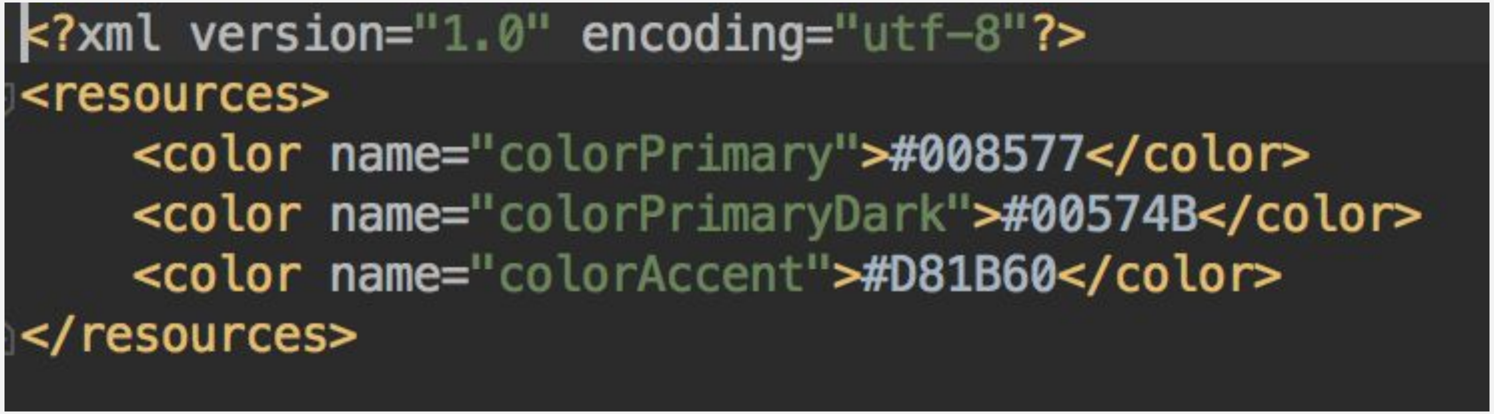
Change the button label to say “Let’s Go”

- Add a new string to strings.xml
- Change the activity_main.xml
- Run the app



Custom Color

- You can also add custom colors (colors.xml)
- You can reference the color using the name
  - Use ***meaningful*** names
- Colors based on hexadecimal value

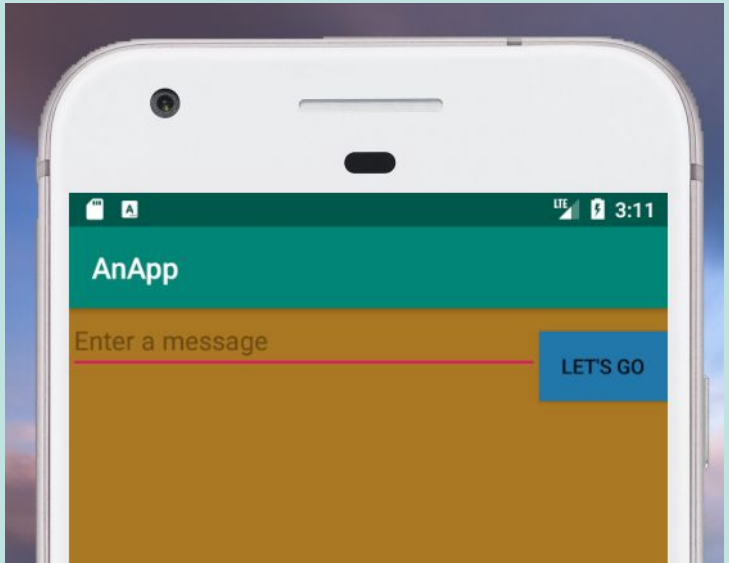


```xml
<?xml version="1.0" encoding="utf-8"?>
<resources>
    <color name="colorPrimary">#008577</color>
    <color name="colorPrimaryDark">#00574B</color>
    <color name="colorAccent">#D81B60</color>
</resources>
```

ICA

Add color

- Add a new custom colors to strings.xml
  - You can use a color picker to choose a color
- Change the background color of the **`ContraintLayout`** and of the Button and the background using the **`android:background`** attribute
- Run the app



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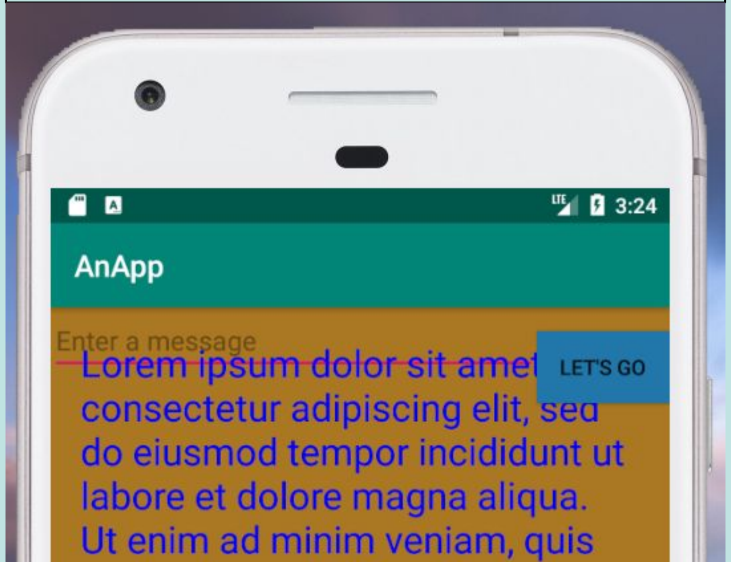
Add some text

- Add a paragraph of text to the Layout using a **`TextView`** tag
- Should have:
  - Large font
  - Blue
  - Centered/padded
- Text/color should be added to strings.xml/colors.xml
- Run the app

```
<TextView
  android:layout_width="wrap_content"
  android:layout_height="wrap_content"
  android:layout_gravity="center"
  android:padding=???
  android:text=???
  android:textColor=???
  android:textSize=??? />
```



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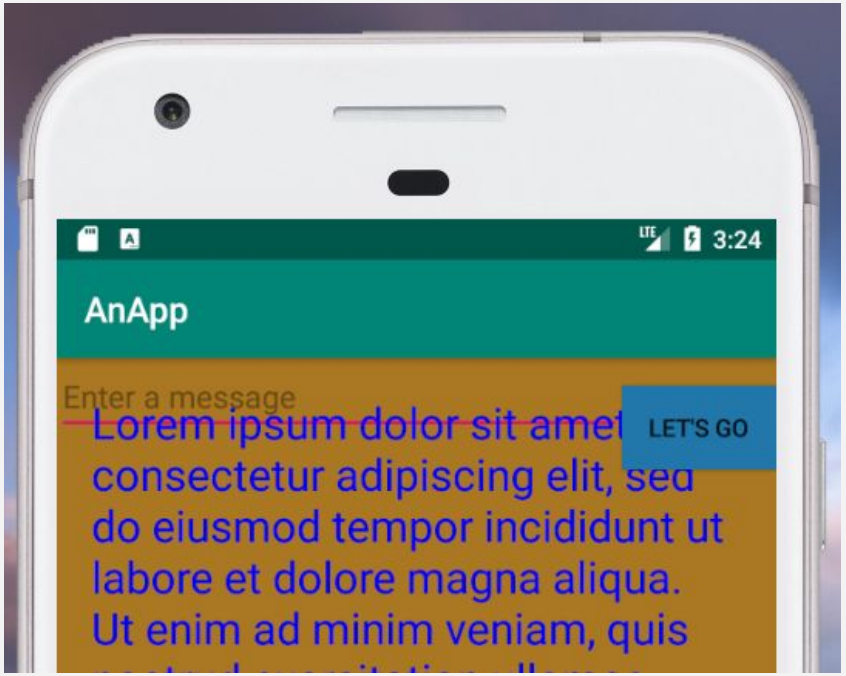
Why the overlap?



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ConstraintLayout vs LinearLayout

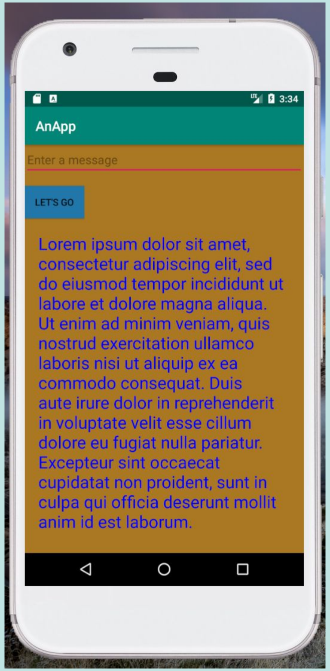
- **ConstraintLayout**: Layout out elements relative to one another
  - Notice things like:
    `app:layout_constraintEnd_toStartOf="@+id/button"`
- **LinearLayout**: Layout out sequentially, either vertically or horizontally

```
<LinearLayout
  . . .
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical">
```

Change the Layout

- Use a LinearLayout
- Set to vertical layout
- Remove the **`app:layout_*`** and **`tools:layout_*`** attributes
- Ensure **`android:layout_width`** and **`android:layout_height`** are defined for the three nested elements

```
<LinearLayout
  . . .
  android:layout_width="match_parent"
  android:layout_height="match_parent"
  android:orientation="vertical">
```



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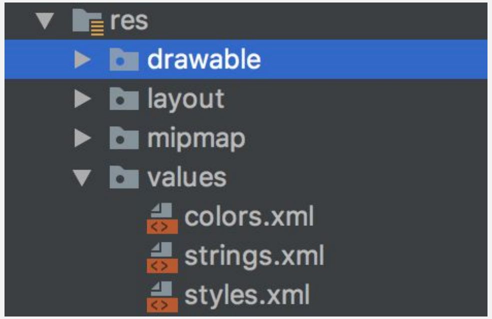
ImageView

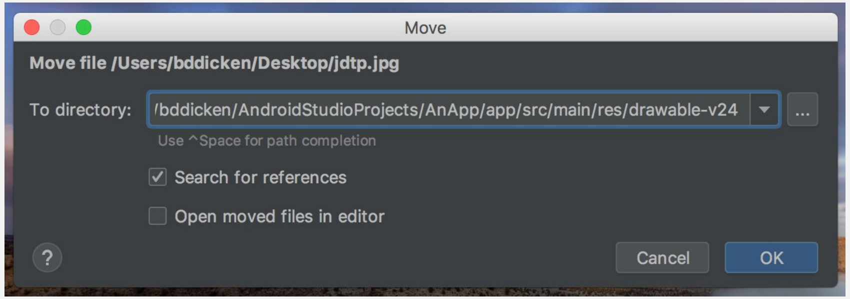
- **ImageView**: View for displaying an image
  - Specify an id
  - Specify the id of the image resource
    - **`android:src="@drawable/drawable_resource_id"`**
  - Can also specify, withd, height, etc.
  - For instance:

```
<ImageView
        android:id="@+id/suns_logo"
        android:layout_width="200dp"
        android:layout_height="200dp"
        android:src="@drawable/suns_logo" />
```

Adding an image

- Click and drag an image to the **drawable** directory
- Change directory to be named **drawable**
- Click OK
- If you didn't change anything else, the ID should be the image name, not including the extension





Move file /Users/bddicken/Desktop/jdtp.jpg

To directory: /bddicken/AndroidStudioProjects/AnApp/app/src/main/res/drawable-v24

Use ^Space for path completion

☑ Search for references

☐ Open moved files in editor

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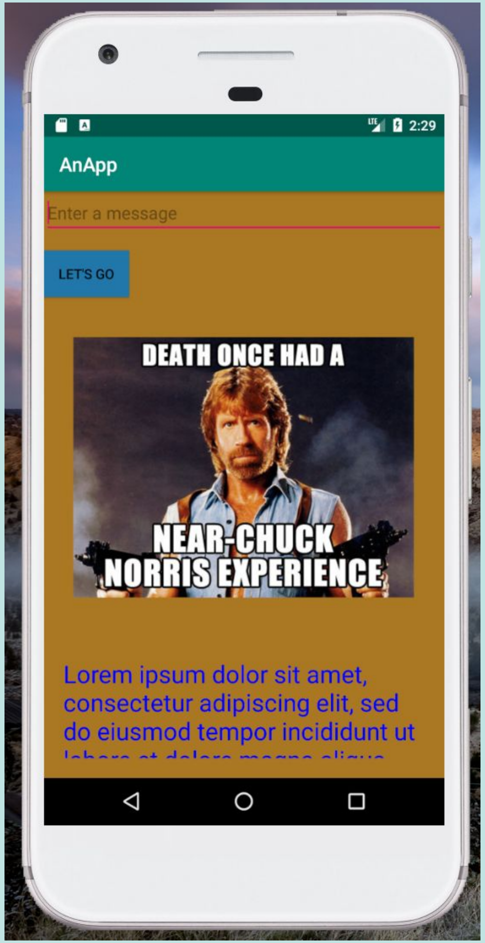
Add an image

- Download and add an image
- Use a ImageView
- Ensure **android:layout_width** and **android:layout_height** are defined

```
<ImageView
  android:id="@+id/some_id"
  android:layout_width="200dp"
  android:layout_height="200dp"
  android:src="@drawable/some_id" />
```



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