Motion UI for Android Apps

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What is MotionLayout?

It is a Java class used to add animation effects to objects (views) in a user interface layout

MotionLayout Operation

MotionLayout allows an object to move from anywhere on the screen to a determined point or it can change color, size, rotation angle, etc. These changes can be made as the object transitions from a state to another.

The object can animate all these states as it goes from a place to another following a path.

These animation are very complicated to implement without the use of MotionLayout.

System's Requirements

Android Studio 4.x, ConstraintLayout 2.x in build.gradle (app), API 26 (minimum): Android 8.0 (Oreo).

New XML Scene File

Android Studio creates a layout file (activity_main.xml) and the Java file (MainActivity.java). Right-click on ConstraintLayout of activity_main.xml and select the Convert to MotionLayout menu option. Android Studio will also have created a new folder named res -> xml and placed within it a MotionLayout scene file named activity_main_scene.xml:

This is the file that will have all the transactions. A MotionLayout editor will provide all the tools to implement them.
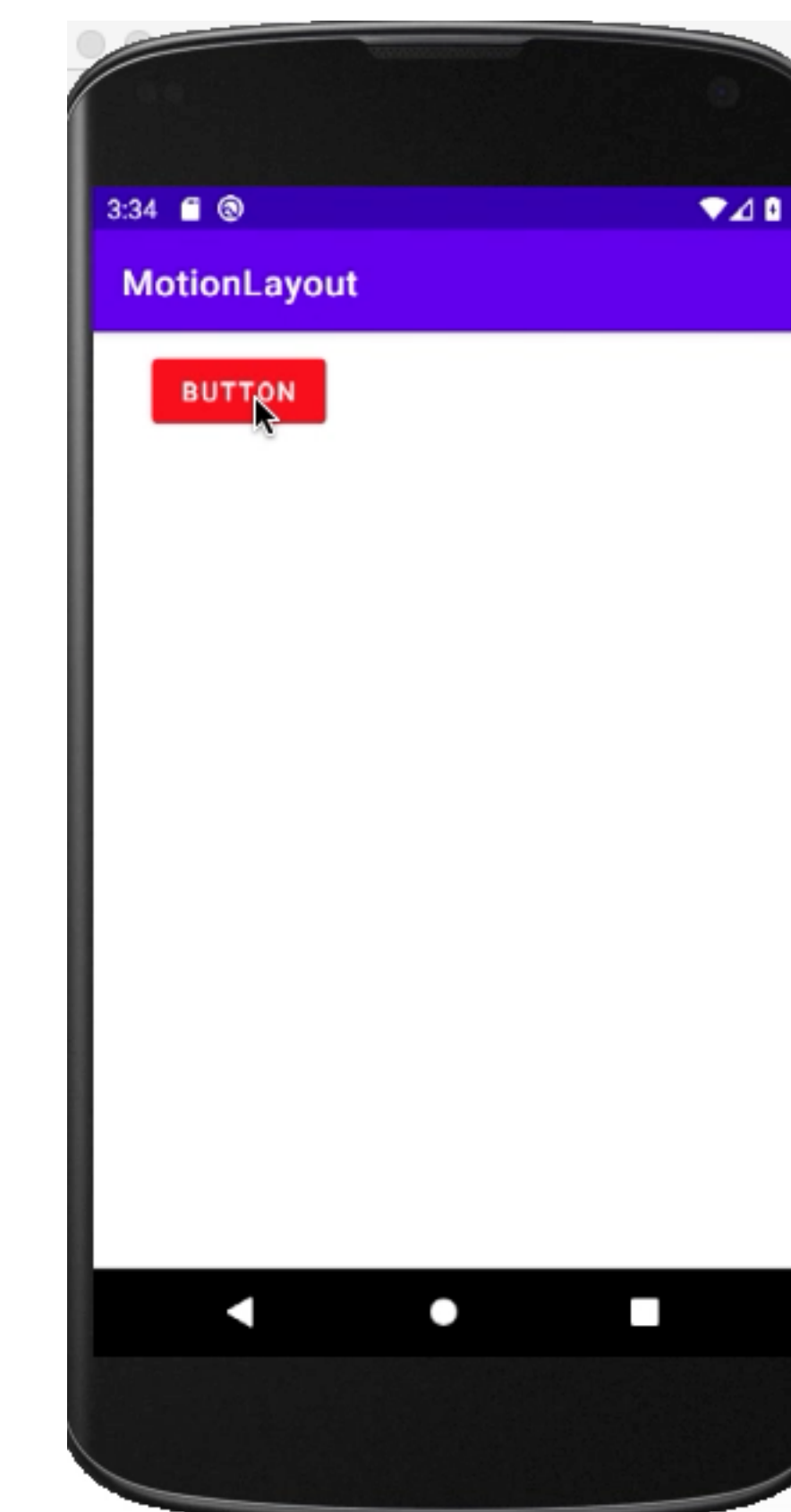
The Animation

The animation consists of a button to toggle between the top and the bottom of the screen. During the move the button will rotate and change gradually from red to green.

```xml
<?xml version="1.0" encoding="utf-8"?>
<MotionScene
    xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:motion="http://schemas.android.com/apk/res-auto">

    <Transition
        motion:constraintSetEnd="@+id/end" motion:constraintSetStart="@id/start"
        motion:duration="1000">
        <KeyFrameSet>
            <KeyAttribute motion:motionTarget="@+id/myButton"
                motion:framePosition="50" android:rotation="360" />
        </KeyFrameSet>
        <OnClick motion:targetId="@id/myButton" motion:clickAction="toggle" />
    </Transition>

    <ConstraintSet android:id="@+id/start">
        <Constraint android:id="@+id/myButton" android:layout_width="wrap_content"
            android:layout_height="wrap_content" motion:layout_constraintTop_toTopOf="parent"
            android:layout_marginTop="8dp" motion:layout_constraintStart_toStartOf="parent"
            motion:layout_constraintEnd_toEndOf="parent" motion:layout_constraintHorizontal_bias="0.113" >
            <CustomAttribute
                motion:attributeName="backgroundColor" motion:customColorValue="#F80A1F" />
        </Constraint>
    </ConstraintSet>

    <ConstraintSet android:id="@+id/end">
        <Constraint android:id="@+id/myButton" android:layout_width="wrap_content"
            android:layout_height="wrap_content" motion:layout_constraintBottom_toBottomOf="parent"
            android:layout_marginBottom="8dp" motion:layout_constraintStart_toStartOf="parent"
            motion:layout_constraintEnd_toEndOf="parent" >
            <CustomAttribute motion:attributeName="backgroundColor" motion:customColorValue="#33CC33" />
        </Constraint>
    </ConstraintSet>
</MotionScene>
```

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