Laptop: Lenovo ThinkPad T400, 4 GB RAM, Intel Core 2 Duo

Phone: Samsung Galaxy S5 running Android 6.0.1

Task 1: Collaborative Sudoku (12 hours and counting)

After researching the Public Notes Taker for a while, I was able to modify the OpenSudoku code to successfully anonymously log in to my Firebase database and attempt to push the data, which came through as an object name instead of anything useful. I'm not understanding the CellCollection serialization/deserialization and how it goes from the Sudoku board to a string and back.

```
if (cell.isEditable()) {

    validate();
    fDatabase.child("puzzle").setValue( CellCollection.deserialize( mCells.toString() ) );
    if (isCompleted()) {
        finish();
        if (mOnPuzzleSolvedListener != null) {
            mOnPuzzleSolvedListener.onPuzzleSolved();
        }
    }
}
}
```

But on the up side, this was at least pushing to the database every time I entered a number into the Sudoku puzzle. At this point, the app stopped showing the input methods when I clicked on a cell. The press events still showed up in the IDE but no code in any of the selection/press areas was being hit. I attempted to debug/Google this for quite some time. It was at this point that my app stopped launching even though I hadn't made a change.

```
Debugger  Console
    ClassLoader referenced unknown path: /data/user/0/com.google.android.gms/app_chimera/m/00000007/n/armeabi-v7a
    ClassLoader referenced unknown path: /data/user/0/com.google.android.gms/app_chimera/m/00000007/n/armeabi
esManager: getTopLevelResources: /data/user/0/com.google.android.gms/app_chimera/m/00000007/DynamiteModulesC_GmsCore_prodmnc_xxhdpi_release.apk / 1.0 running in edu
esManager: getTopLevelResources: /data/user/0/com.google.android.gms/app_chimera/m/00000007/DynamiteModulesC_GmsCore_prodmnc_xxhdpi_release.apk / 1.0 running in edu
Runtime: Shutting down VM
Runtime: FATAL EXCEPTION: main
    Process: edu.wright.ceg3900, PID: 9026
    java.lang.RuntimeException: Unable to start activity ComponentInfo{edu.wright.ceg3900/edu.wright.ceg3900.gui.SudokuPlayActivity}: android.view.InflateExcep
        at android.app.ActivityThread.performLaunchActivity(ActivityThread.java:3253)
        at android.app.ActivityThread.handleLaunchActivity(ActivityThread.java:3349)
        at android.app.ActivityThread.access$1100(ActivityThread.java:221)
        at android.app.ActivityThread$H.handleMessage(ActivityThread.java:1794)
        at android.os.Handler.dispatchMessage(Handler.java:102)
```

I did another clean and rebuild since pretty much anything I could find my Google searches seemed to fix that for other people. Now it was claiming that I didn't have play services installed even though it was present the whole time and is included in the manifest screenshot above.

I clicked the option to install the repo and sync the project.
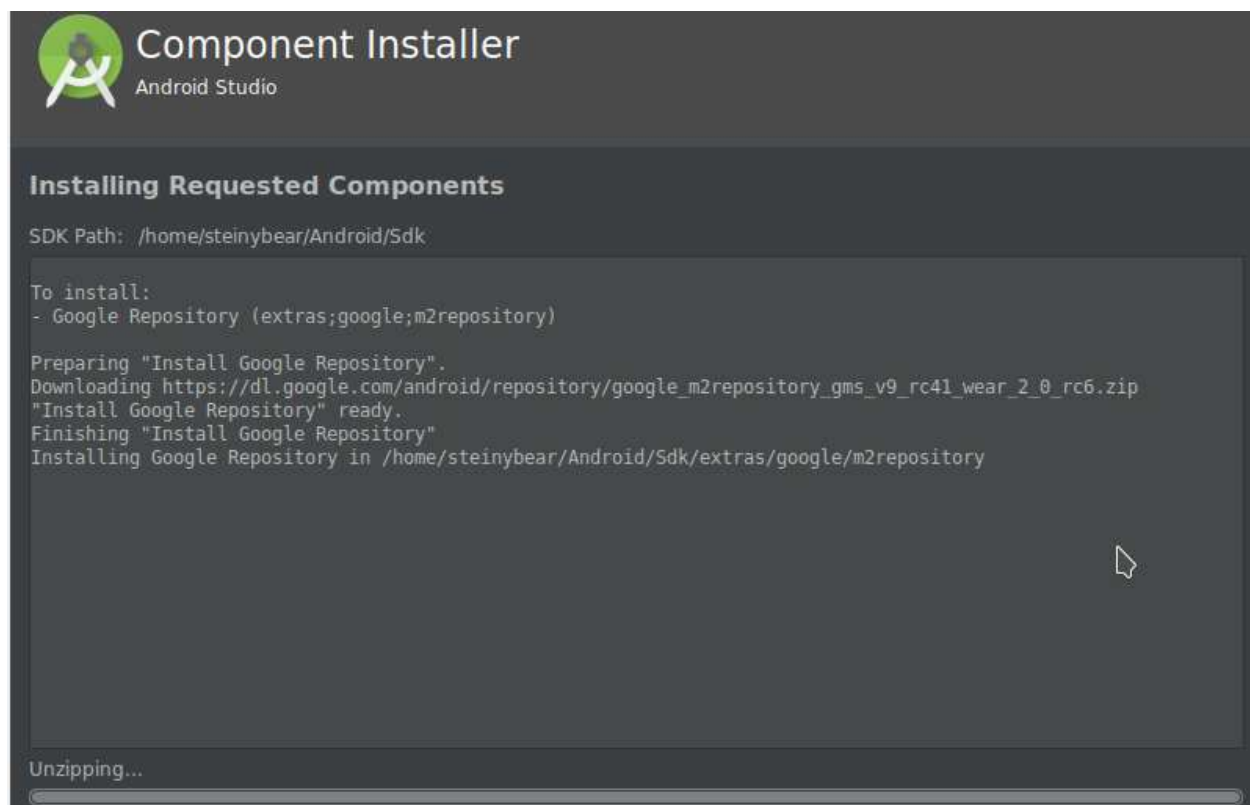
This produced more errors than I started with, including the same error that it was claiming before.
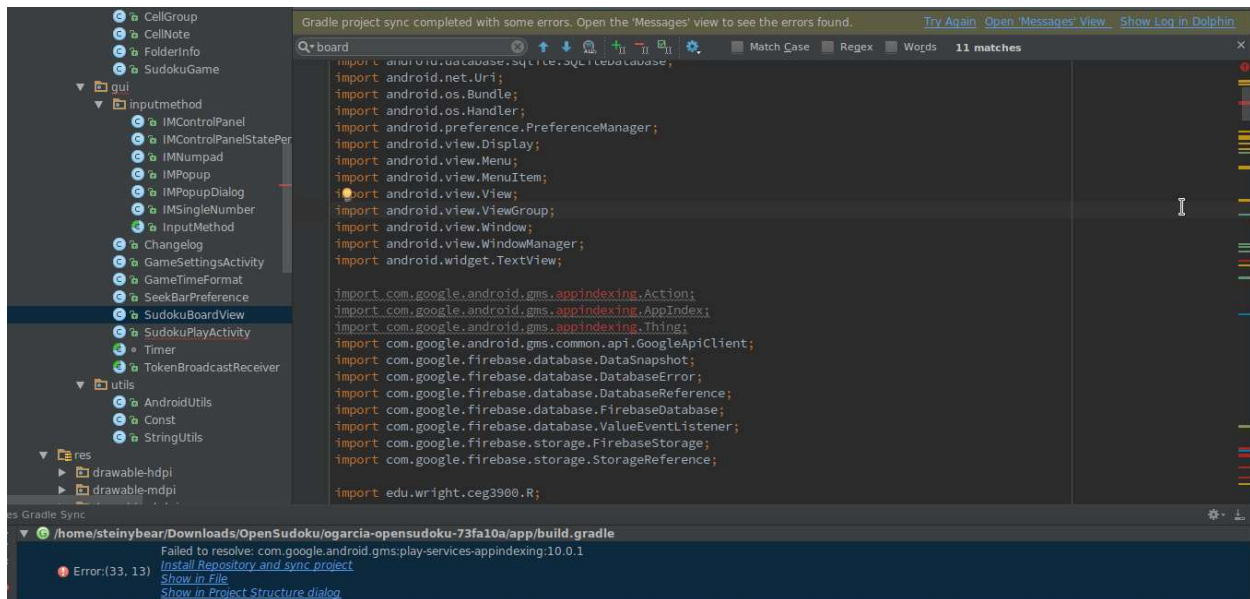
Now every time I launch the app, it automatically closes itself.

I'm continuing to work on this task as time permits, but I'm considering redownloading the original OpenSudoku APK and starting from scratch since my project is collapsing in on itself whether I actually make a change or not and I'm kind of starting to panic about getting behind.

Task 2: Firebase Auth (2 hours and counting)

```
Gradle files have changed since last project sync. A project sync may be necessary for the IDE to work properly.
android {
    compileSdkVersion 22
    buildToolsVersion "22.0.1"

    defaultConfig {
        applicationId "edu.wright.ceg3900"
        minSdkVersion 9
        targetSdkVersion 22
        versionCode 20160919
        versionName "2.2.1"
    }
    buildTypes {
        release {
            minifyEnabled true
            shrinkResources true
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
        }
    }
}

dependencies {
    compile fileTree(dir: 'libs', include: ['*.jar'])
    compile 'com.android.support:appcompat-v7:22.2.1'
    compile 'com.google.firebase:firebase-storage:10.0.1'
    compile 'com.firebaseui:firebase-ui:1.1.1'
    compile 'com.google.firebase:firebase-auth:10.0.1'
    compile 'com.google.android.gms:play-services-auth:10.0.1'
}


apply plugin: 'com.google.gms.google-services'
```

I started out by adding Firebase to the OpenSudoku APK, but it required a minimum SDK
version of 16 which was a quick and easy fix. The minSdkVersion in the manifest was set to 9 so
I switched it to 16.


```
Gradle tasks [:app:generateDebugSources, :app:mockableAndroidJar, :app:prepareDebugUnitTestDependencies, :app:generateDebugAndroidTestSources]
Execution failed for task ':app:processDebugManifest'.
> Manifest merger failed : uses-sdk:minSdkVersion 9 cannot be smaller than version 16 declared in library [com.firebaseui:firebase-ui:1.1.1]
/home/steinybear/Downloads/OpenSudoku/ogarcia-opensudoku-73fa10a/app/build/intermediates/exploded-aar/com.firebaseui/firebase-ui/1.1.1/AndroidManifest.xml
    Suggestion: use tools:overrideLibrary="com.firebase.ui" to force usage
```

This broke several UI elements and the project would no longer build:
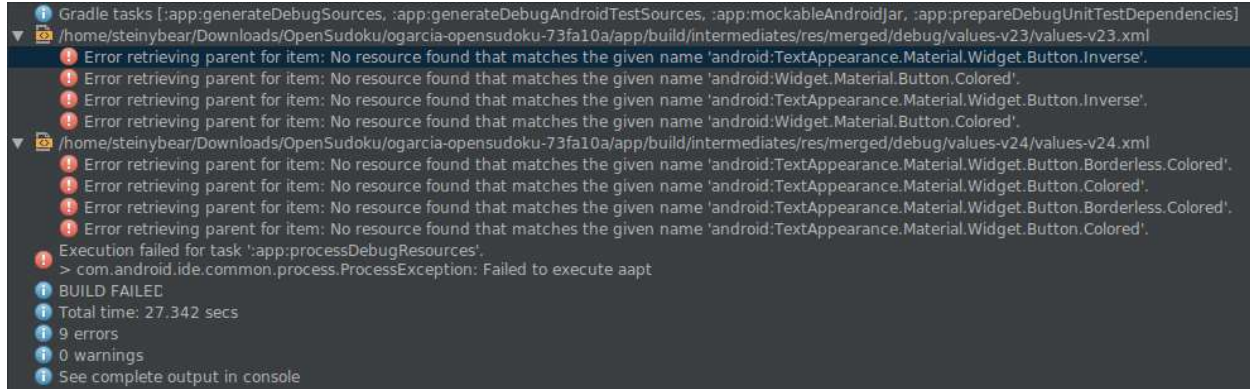
After some Googling, I found the suggestion that this was a problem with the build tools version

and it was recommended to go back to 22.0.0. I set this in the manifest and installed/synced:
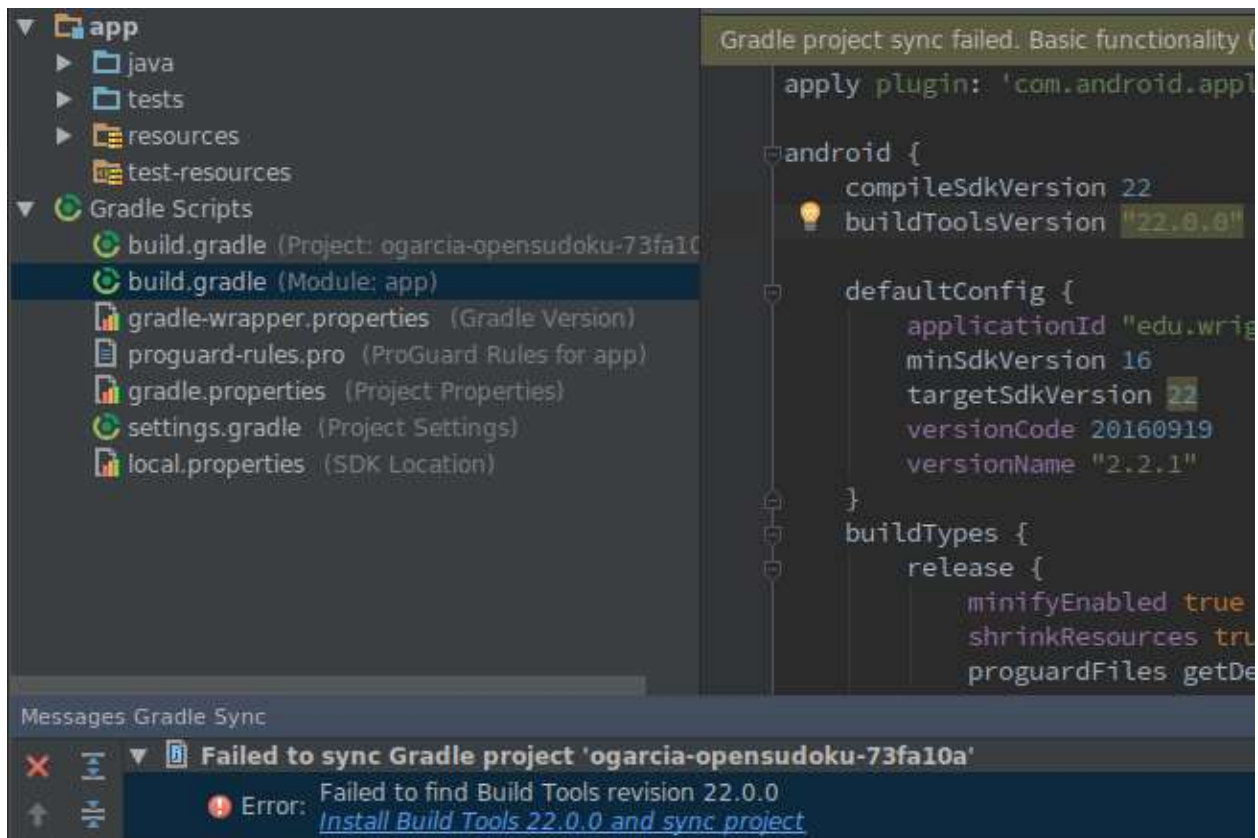
This didn't end up working either. After a lot more digging I found another forum post chain saying that they fixed the problem by using build tools version 23. This posting also suggested that dependencies be added to the manifest for app compatibility of the same version:
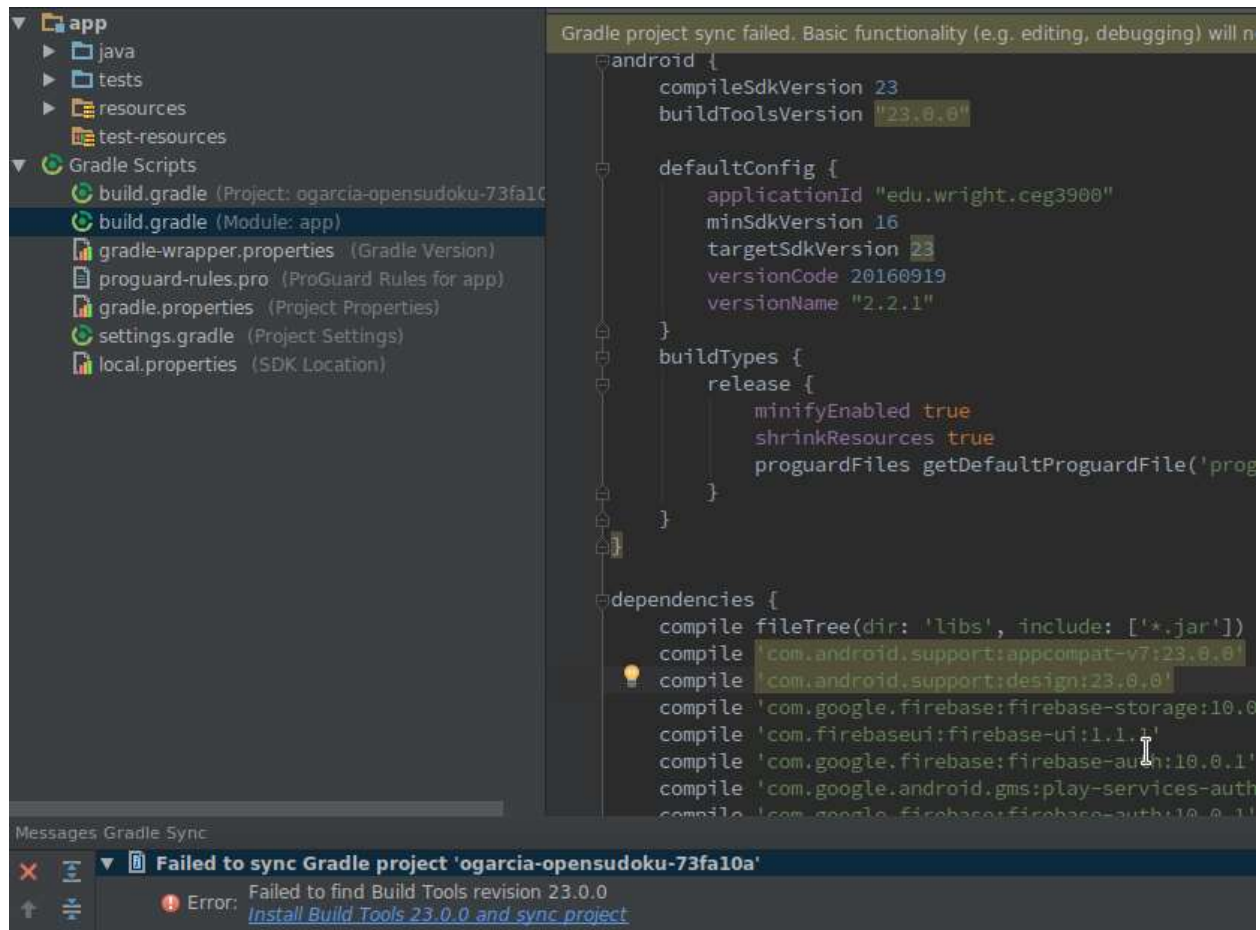
The UI errors were finally resolved. At this stage in the project, I was still interpreting task 1 to mean that we needed to add Google/Email/etc. authentication and attempted to add the activities from the auth project in Firebase to my project to see if I could utilized them. This resulted in a "Cannot resolve symbol 'R'" error. I spent quite a lot of time Googling this error and the problems and solutions vary far and wide. Cleaning and rebuilding the project appeared to work but the problem intermittently returned. I realized I didn't have the layout xml files from the auth project so I added them to the OpenSudoku project which resulted in the following:
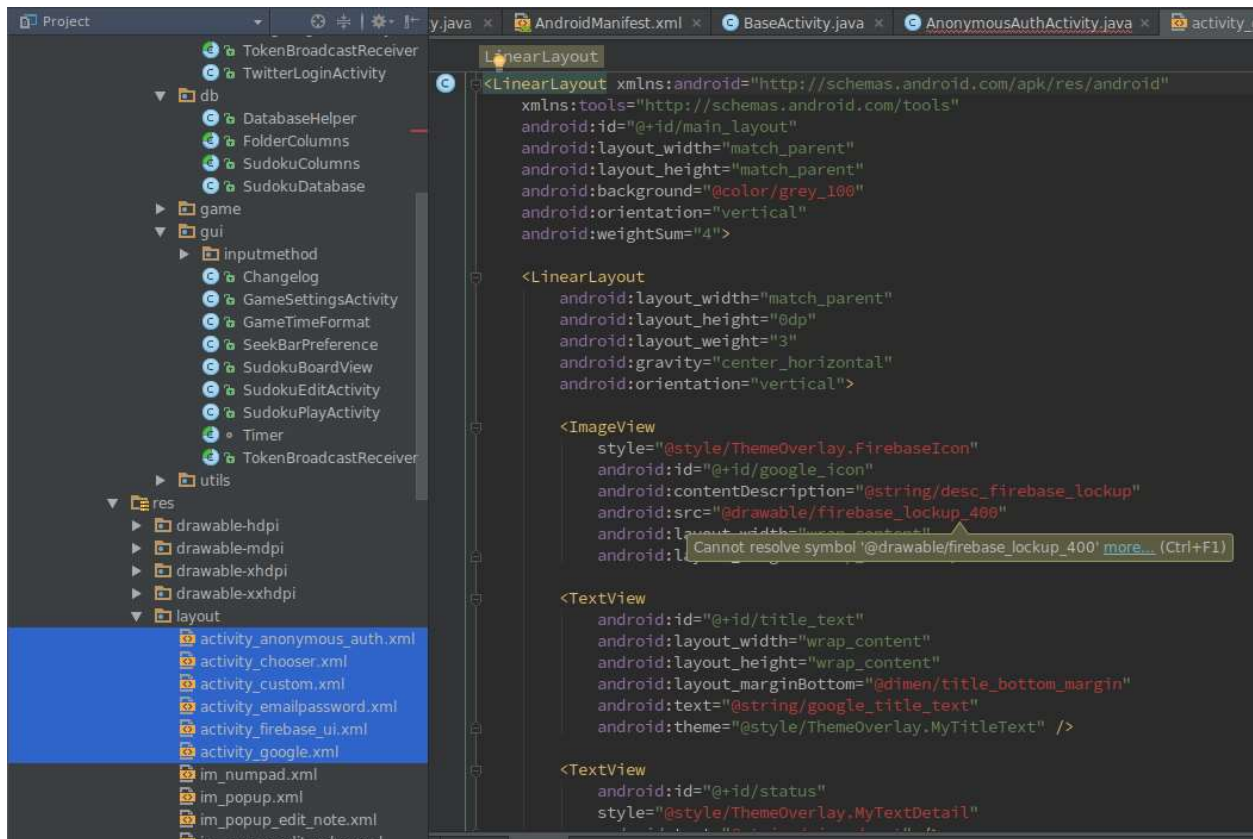
Adding the drawables and strings to OpenSudoku was a dead end as well, so I decided that my current method was a dead end and attempted to understand and follow the guide posted on the course page:
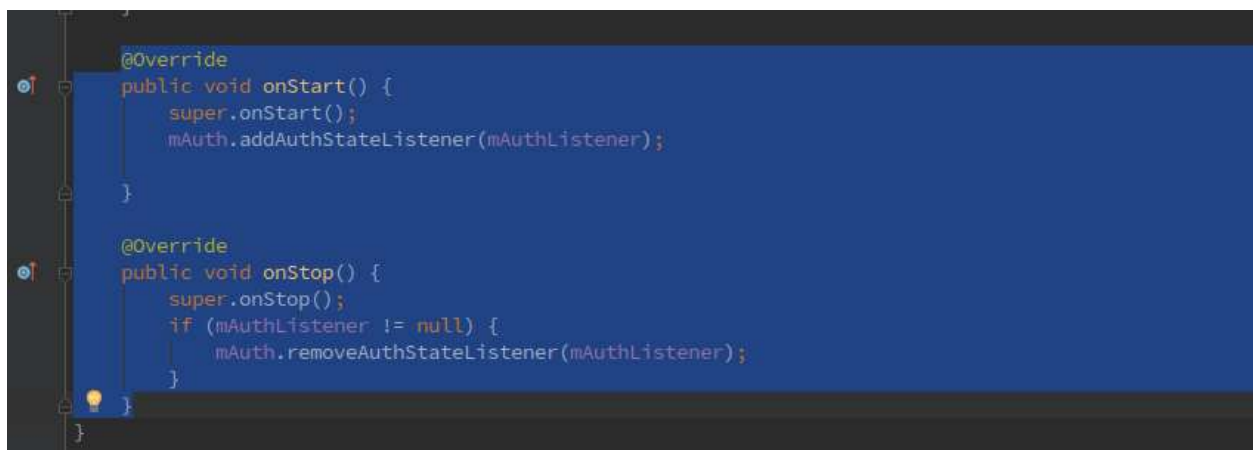

I tried to make sense of the rest of the guide but was having a lot of difficulty piecing together what exactly I needed to do to make this happen with my APK. In a last ditch effort, I researched

if it was possible to import another project directly into the existing OpenSudoku. My hope was

that I could bring in the entire auth section of the Firebase APK into my OpenSudoku,

dependencies and all.
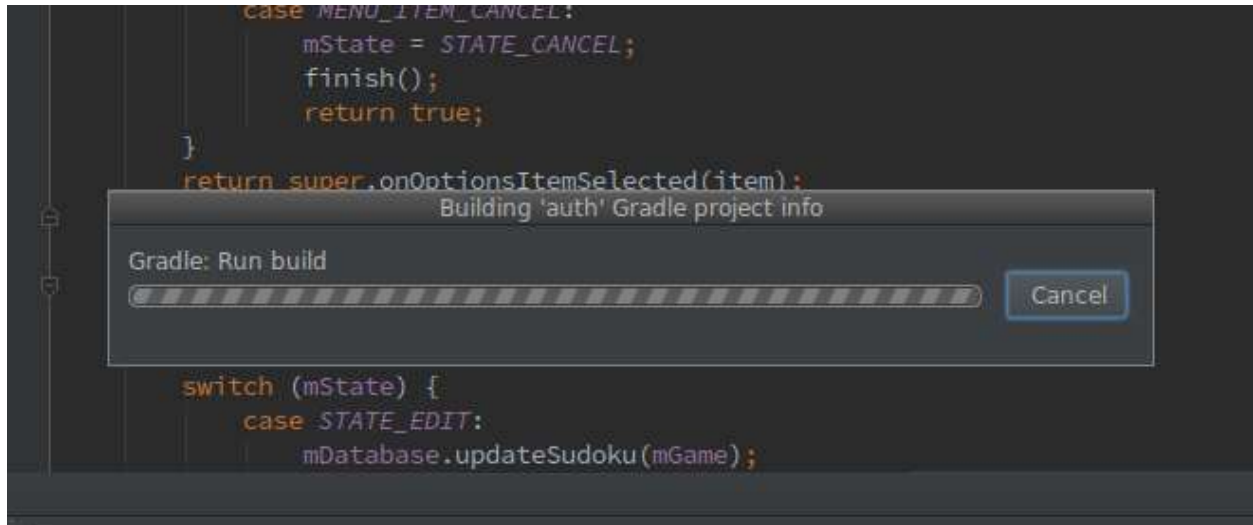
This didn't work either:
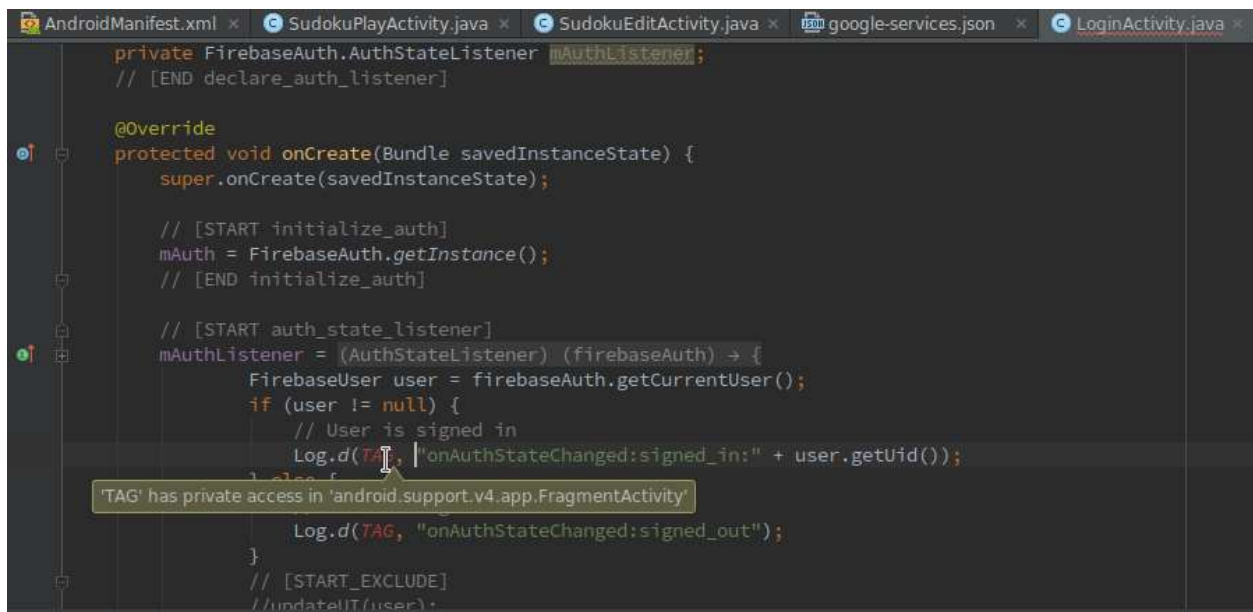
I attempted to inject the tag into the onCreate method as a paremeter:

```
// [START initialize_auth]
mAuth = FirebaseAuth.getInstance();
// [END initialize_auth]

// [START auth_state_listener]
mAuthListener = (AuthStateListener) (firebaseAuth) -> {
        FirebaseUser user = firebaseAuth.getCurrentUser();
        if (user != null) {
            // User is signed in
            Log.d(TAG, "onAuthStateChanged:signed_in:" + user.getUid());
        } else {
            // User is signed out
            Log.d(TAG, "onAuthStateChanged:signed_out");
        }
    }
```

I was completely lost on this task before the app started breaking and I haven't been able to continue work on this task.

Task 3: A Quiz on Firebase (30 minutes)

I am not 100% sure I've hit the mark on this task, but in reading the links posted on the course website regarding javadocs, conditions, and asserts I came up with this:

Precondition: The user has granted camera permissions to the app

Postcondition: The ImagePicker activity has been created and started

The diff between the file with included Javadoc comment and the original file are attached in the Pilot submission

Task 4 and 5: Code Quality Improvement and Speed + Size Improvement of Pruned OpenSudoku (1 hour and counting)

There are two areas that I think apply to both the code smell and refactoring categories: SudokuDatabase and DatabaseHelper. I haven't reached a good enough understanding to know exactly how I'd like to improve on these things, but have been thinking about the following:

SudokuDatabase:

This smells because when thinking of the APK in terms of sending all entered numbers to the Firebase database, it seems completely unnecessary to maintain a local SQLite database to store the information. This code also smells in general because it is tangled up in some other activities and seems as if it will be pretty difficult to refactor out of the program. This also applies to the speed increase in that it seems I could eliminate all of the associated overhead of maintaining the local SQLite database by successfully refactoring it out of the APK.

DatabaseHelper:

This class's code smell reeks. Lines 80 to 171 in my APK consist of database insert statements that contain hard-coded string versions of the included Sudoku puzzles. It seems really weird that we would use magic strings to create the puzzles and then alternate between turning them into a CellCollection and string throughout the program. Not only is that smelly in general, it is clearly additional overhead that could be eliminated by finding a solution with a persistent type instead of converting back and forth.

Since the project will no longer even run, I've had to put task 2, 4, and 5 on the backburner until I can figure out how to get running again.

Project experience so far:

I'm having a very difficult time getting things working. Between the time sink of random errors, Google searches, and recompiling/running to test solutions, I can't seem to find enough time to make substantial progress. I am extremely lost and confused and concerned with being able to complete P3 in time for P4

Total Time So Far: 15.5 hours