The Manifest
Working with Location
What are some ways that location is used in mobile dev?

- Fused Location
  - Sensor fusion from a variety of different location sources
  - Asking for location based on high level concerns rather than technologies

- Geofencing
  - Setting up geographic triggers

- Activity Recognition
Geofencing
Working with Location

• In order to work with location more set up must be done

• The Google Play SDK must be installed
  • This library links the phone, the user and the location data tools together

• Many location data tools are personalized
  • Frequently visited places
  • Recommended routes
  • Recommended destinations
Working with Location
Working with Location

### Android SDK Manager

**SDK Path:** /Users/djp3/Development/Android/adt-bundle-mac-x86_64-current/sdk

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<th>Name</th>
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Show: [✓] Updates/New  [✓] Installed  Select New or Updates

- [ ] Obsolete

Deselect All

Install 7 packages...

Delete packages...

Done loading packages.
• Android projects have to be **packaged**
• This creates an “.apk” file
• In that file are
  • a manifest
  • **resources** associated with your app
    • graphics, sounds, data files
  • compiled byte code
• “gradle” is the tool/language that describes how to package the “.apk”
Working with Location

- Gradle must be told to package the Google Play SDK
Working with Location
Gradle files have changed since last project sync. A project sync may be necessary for the following:

```groovy
apply plugin: 'com.android.application'

android {
    compileSdkVersion 22
    buildToolsVersion "21.1.2"
    defaultConfig {
        applicationId "ics163.luci.ics.uci.edu.gpsdrawapp"
        minSdkVersion 21
        targetSdkVersion 21
        versionCode 1
        versionName "1.0"
    }
    buildTypes {
        release {
            minifyEnabled false
            proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
        }
    }
    dependencies {
        compile fileTree(dir: 'libs', include: ['*.jar'])
        compile 'com.google.android.gms:play-services:7.0.0'
    }
}
```
Working with Location

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apply plugin: 'com.android.application'

android {
    compileSdkVersion 22
    buildToolsVersion "21.1.2"

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        applicationId "ics163.luci.ics.uci.edu.gpsdrawapp"
        minSdkVersion 21
        targetSdkVersion 21
    }
```
Working with Location

- The Manifest needs to be updated to tell Android that this application uses “location”

- There are about 100 sensitive permissions that apps might need to request:
  - See them all here:
<?xml version="1.0" encoding="utf-8"?>
<manifest xmlns:android="http://schemas.android.com/apk/res/android"
    xmlns:tools="http://schemas.android.com/tools">
    <application>
        <allowBackup>true</allowBackup>
        <icon>ic_launcher</icon>
        <label>GPSDrawApp</label>
        <theme>E@style/AppTheme</theme>
        <activity>
            <name>.MainActivity</name>
            <label>GPSDrawApp</label>
            <intent-filter>
                <action android:name="android.intent.action.MAIN"/>
                <category android:name="android.intent.category.LAUNCHER"/>
            </intent-filter>
        </activity>
    </application>
    <uses-permission android:name="android.permission.ACCESS_FINE_LOCATION"/>
</manifest>
<manifest>
  <application>
    <activity
      android:name=".MainActivity"
      android:label="GPSDrawApp"/>
    <intent-filter>
      <action android:name="android.intent.action.MAIN"/>
      <category android:name="android.intent.category.LAUNCHER"/>
    </intent-filter>
  </activity>
  <uses-permission
    android:name="android.permission.ACCESS_FINE_LOCATION"/>
</manifest>
Connecting to Google Play Services
Connecting to Google Play Services

- Lots of failure modes that must be handled
  - User hasn’t logged in
  - Phone software is out of date
  - Network connection fails
  - Phone rotates while user is fixing a problem
Let’s get an example of an application getting your last known location running
Example

- Create a skeleton program
- Install/require Google Play SDK
- Give app permission to use location
- Create a Google Play Object
  - Handle error conditions
- Create a UI
- Get references to the UI elements
- Connect Google Play Object
  - On success, put our last known location into the UI