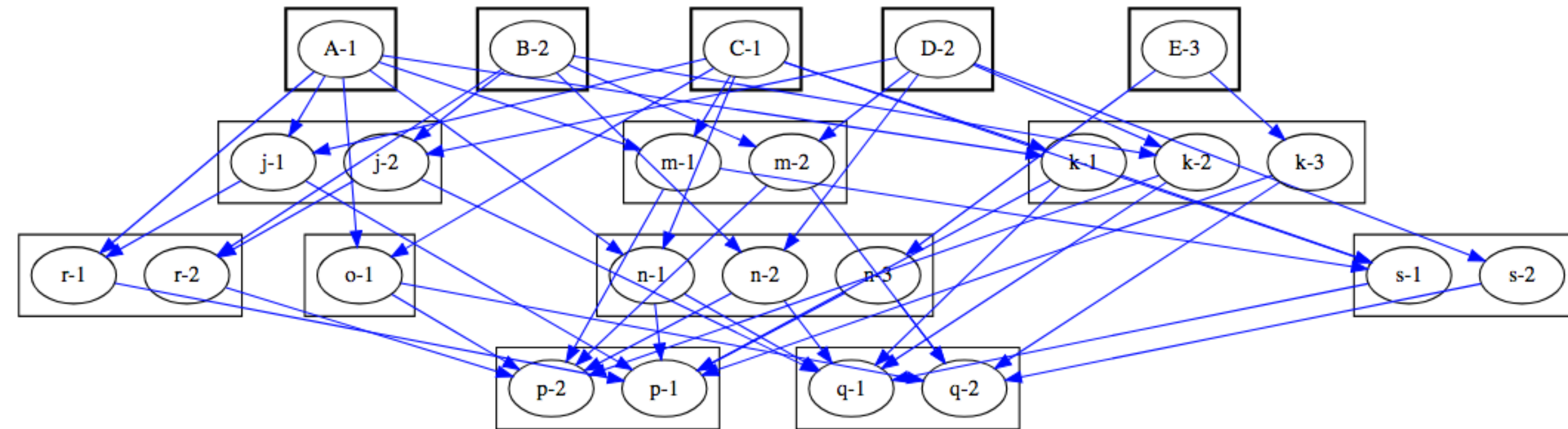# Semantic Version Management

Semantic Version Management

A simple set of rules and requirements that dictate how version numbers are assigned and incremented

Semantic Versioning

"In the world of software management there exists a dread place called "dependency hell." The bigger your system grows and the more packages you integrate into your software, the more likely you are to find yourself, one day, in this pit of despair."

https://semver.org/

"…Once you identify your public API, you communicate changes to it with specific increments to your version number. Consider a version format of X.Y.Z (Major.Minor.Patch). Bug fixes not affecting the API increment the patch version, backwards compatible API additions/changes increment the minor version, and backwards incompatible API changes increment the major version…"

"…I call this system "Semantic Versioning." Under this scheme, version numbers and the way they change convey meaning about the underlying code and what has been modified from one version to the next…"

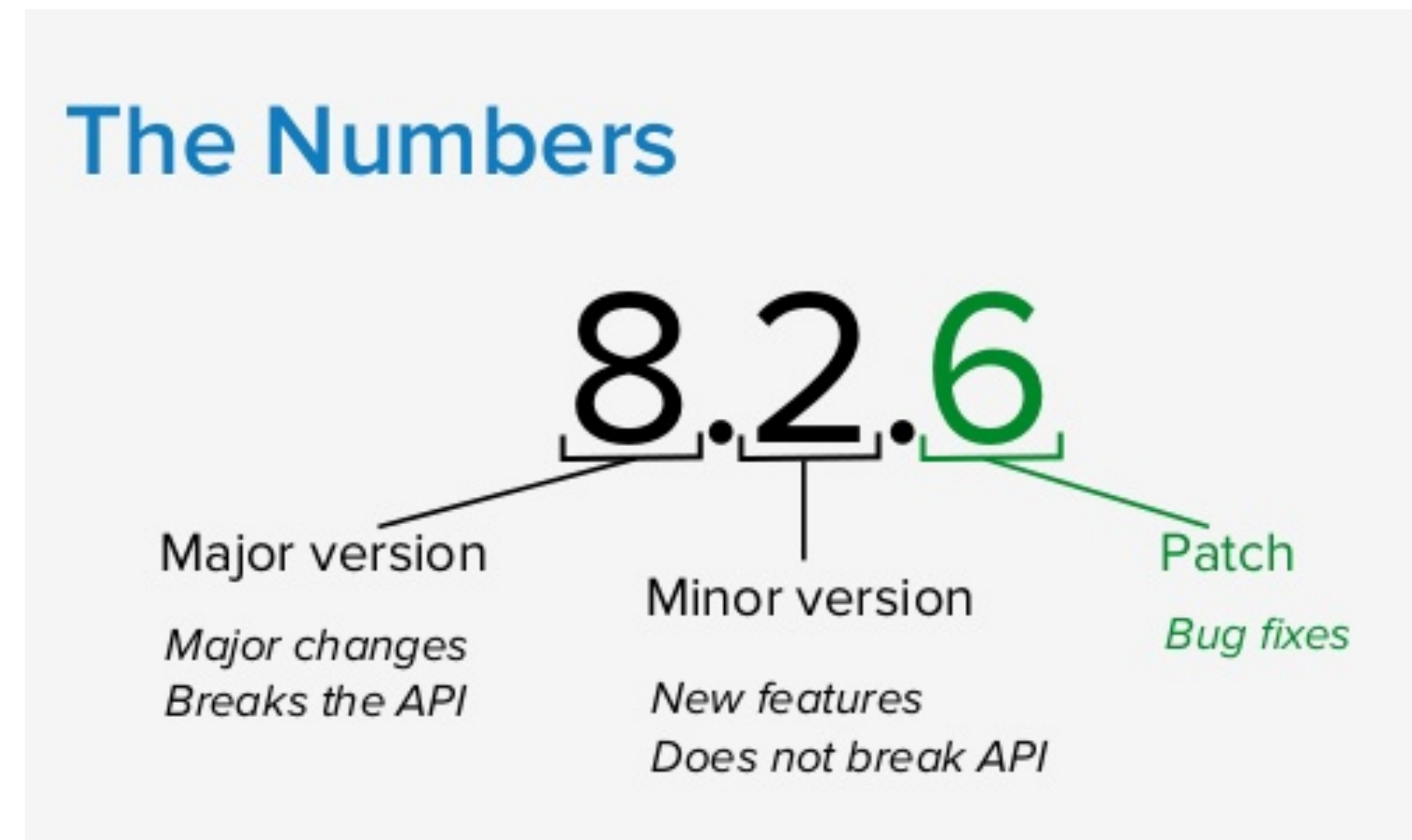Tom Preston-Werner, inventor of Gravatars and cofounder of GitHub.

Summary

Given a version number MAJOR.MINOR.PATCH, increment the:

1. **MAJOR** version when you make incompatible API changes,
2. **MINOR** version when you add functionality in a backwards-compatible manner, and
3. **PATCH** version when you make backwards-compatible bug fixes.

Additional labels for pre-release and build metadata are available as extensions to the MAJOR.MINOR.PATCH format.

The Numbers

8.2.6

Major version
*Major changes
Breaks the API*

Minor version
*New features
Does not break API*

Patch
Bug fixes

Project Gradle

```
buildscript {
  ext.kotlin_version = '1.2.71'
  repositories {
    google()
    jcenter()
  }
  dependencies {
    classpath 'com.android.tools.build:gradle:3.2.1'
    classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"

    // NOTE: Do not place your application dependencies here; they belong
    // in the individual module build.gradle files
  }
}

allprojects {
  repositories {
    google()
    jcenter()
  }
}

task clean(type: Delete) {
  delete rootProject.buildDir
}
```

Project Gradle

Kotlin Compiler

Gradle

```gradle
buildscript {
    ext.kotlin_version = '1.2.71'
    repositories {
        google()
        jcenter()
    }
    dependencies {
        classpath 'com.android.tools.build:gradle:3.2.1'
        classpath "org.jetbrains.kotlin:kotlin-gradle-plugin:$kotlin_version"

        // NOTE: Do not place your application dependencies here; they belong
        // in the individual module build.gradle files
    }
}

allprojects {
    repositories {
        google()
        jcenter()
    }
}

task clean(type: Delete) {
    delete rootProject.buildDir
}
```

Application Gradle

Before AndroidX Migration

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

apply plugin: 'kotlin-android'

apply plugin: 'kotlin-android-extensions'

androidExtensions {
  experimental = true
}

android {
  compileSdkVersion 28
  defaultConfig {
    applicationId "org.wit.placemark"
    minSdkVersion 23
    targetSdkVersion 28
    versionCode 1
    versionName "1.0"
    testInstrumentationRunner "android.support.test.runner.AndroidJUnitRunner"
  }
  buildTypes {
    release {
      minifyEnabled false
      proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
    }
  }
}

dependencies {
  implementation fileTree(dir: 'libs', include: ['*.jar'])
  implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
  implementation 'com.android.support:appcompat-v7:28.0.0'
  implementation 'com.android.support.constraint:constraint-layout:1.1.3'
  implementation 'com.android.support:design:28.0.0'
  implementation 'com.android.support:cardview-v7:28.0.0'
  implementation 'com.google.android.gms:play-services-maps:16.0.0'
  implementation 'com.google.android.gms:play-services-location:16.0.0'
  implementation 'org.jetbrains.anko:anko-commons:0.10.7'
  implementation "com.google.code.gson:gson:2.8.5"
  testImplementation 'junit:junit:4.12'
  androidTestImplementation 'com.android.support.test:runner:1.0.2'
  androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'
}
```
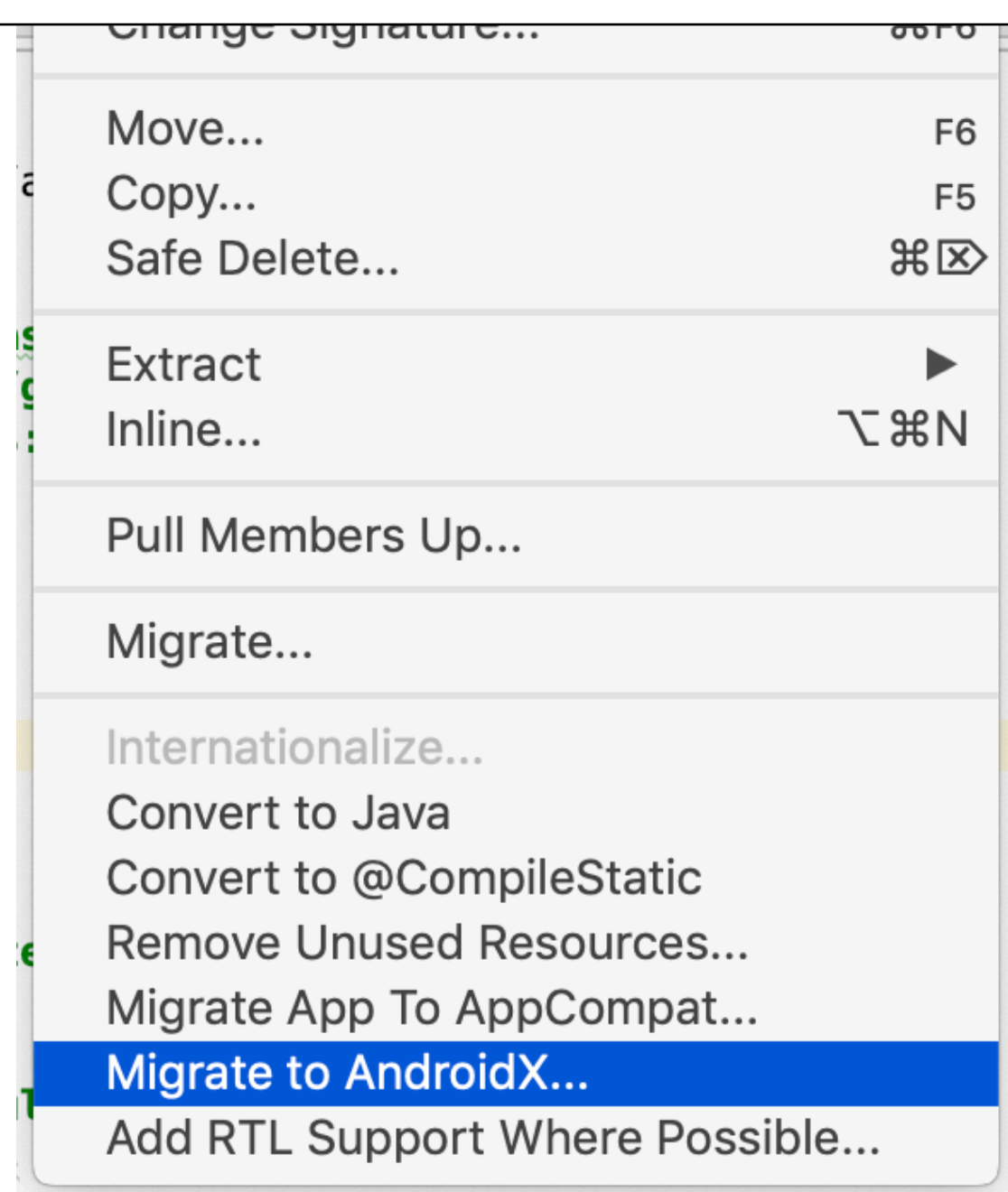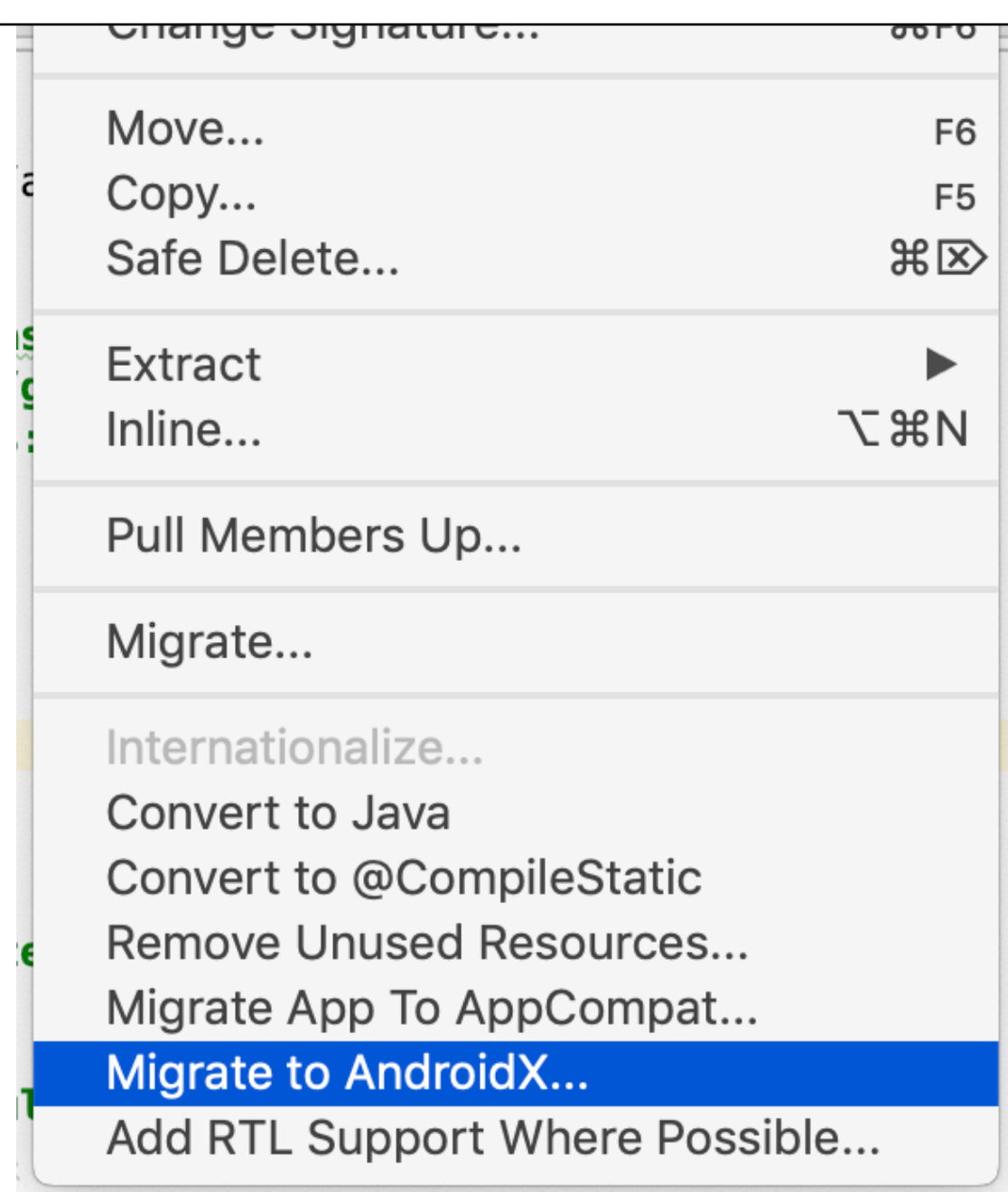
```gradle
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'com.android.support:appcompat-v7:28.0.0'
    implementation 'com.android.support.constraint:constraint-layout:1.1.3'
    implementation 'com.android.support:design:28.0.0'
    implementation 'com.android.support:cardview-v7:28.0.0'
    implementation 'com.google.android.gms:play-services-maps:16.0.0'
    implementation 'com.google.android.gms:play-services-location:16.0.0'
    implementation 'org.jetbrains.anko:anko-commons:0.10.7'
    implementation "com.google.code.gson:gson:2.8.5"
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'com.android.support.test:runner:1.0.2'
    androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'
}
```

```
Change Signature...          ⌘F6
Move...                       F6
Copy...                       F5
Safe Delete...               ⌘⌫

Extract                        ▶
Inline...                   ⌥⌘N

Pull Members Up...

Migrate...

Internationalize...
Convert to Java
Convert to @CompileStatic
Remove Unused Resources...
Migrate App To AppCompat...
Migrate to AndroidX...
Add RTL Support Where Possible...
```

```gradle
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'androidx.appcompat:appcompat:1.0.2'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.0-alpha2'
    implementation 'com.google.android.material:material:1.1.0-alpha01'
    implementation 'androidx.cardview:cardview:1.0.0'
    implementation 'com.google.android.gms:play-services-maps:16.0.0'
    implementation 'com.google.android.gms:play-services-location:16.0.0'
    implementation 'org.jetbrains.anko:anko-commons:0.10.7'
    implementation "com.google.code.gson:gson:2.8.5"
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'androidx.test:runner:1.1.0'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.1.0'
}
```

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'com.android.support:appcompat-v7:28.0.0'
    implementation 'com.android.support.constraint:constraint-layout:1.1.3'
    implementation 'com.android.support:design:28.0.0'
    implementation 'com.android.support:cardview-v7:28.0.0'
    implementation 'com.google.android.gms:play-services-maps:16.0.0'
    implementation 'com.google.android.gms:play-services-location:16.0.0'
    implementation 'org.jetbrains.anko:anko-commons:0.10.7'
    implementation "com.google.code.gson:gson:2.8.5"
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'com.android.support.test:runner:1.0.2'
    androidTestImplementation 'com.android.support.test.espresso:espresso-core:3.0.2'
}
```

```
Change Signature...          ⌘F6

Move...                      F6
Copy...                      F5
Safe Delete...               ⌘⌫

Extract                      ▶
Inline...                    ⌥⌘N

Pull Members Up...

Migrate...

Internationalize...
Convert to Java
Convert to @CompileStatic
Remove Unused Resources...
Migrate App To AppCompat...
Migrate to AndroidX...
Add RTL Support Where Possible...
```

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'androidx.appcompat:appcompat:1.0.2'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.0-alpha2'
    implementation 'com.google.android.material:material:1.1.0-alpha01'
    implementation 'androidx.cardview:cardview:1.0.0'
    implementation 'com.google.android.gms:play-services-maps:16.0.0'
    implementation 'com.google.android.gms:play-services-location:16.0.0'
    implementation 'org.jetbrains.anko:anko-commons:0.10.7'
    implementation "com.google.code.gson:gson:2.8.5"
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'androidx.test:runner:1.1.0'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.1.0'
}
```

```
apply plugin: 'com.android.application'
apply plugin: 'kotlin-android'
apply plugin: 'kotlin-android-extensions'

androidExtensions {
  experimental = true
}

android {
  compileSdkVersion 28
  defaultConfig {
    applicationId "org.wit.placemark"
    minSdkVersion 23
    targetSdkVersion 28
    versionCode 1
    versionName "1.0"
    testInstrumentationRunner "androidx.test.runner.AndroidJUnitRunner"
  }
  buildTypes {
    release {
      minifyEnabled false
      proguardFiles getDefaultProguardFile('proguard-android.txt'), 'proguard-rules.pro'
    }
  }
}

dependencies {
  implementation fileTree(dir: 'libs', include: ['*.jar'])
  implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
  implementation 'androidx.appcompat:appcompat:1.0.2'
  implementation 'androidx.constraintlayout:constraintlayout:2.0.0-alpha2'
  implementation 'com.google.android.material:material:1.1.0-alpha01'
  implementation 'androidx.cardview:cardview:1.0.0'
  implementation 'com.google.android.gms:play-services-maps:16.0.0'
  implementation 'com.google.android.gms:play-services-location:16.0.0'
  implementation 'org.jetbrains.anko:anko-commons:0.10.7'
  implementation "com.google.code.gson:gson:2.8.5"
  testImplementation 'junit:junit:4.12'
  androidTestImplementation 'androidx.test:runner:1.1.0'
  androidTestImplementation 'androidx.test.espresso:espresso-core:3.1.0'
}
```

Android
Platform
versions

Android
Application
Libraries

Android Application Libraries

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation 'androidx.appcompat:appcompat:1.0.2'
    implementation 'androidx.constraintlayout:constraintlayout:2.0.0-alpha2'
    implementation 'com.google.android.material:material:1.1.0-alpha01'
    implementation 'androidx.cardview:cardview:1.0.0'
    implementation 'com.google.android.gms:play-services-maps:16.0.0'
    implementation 'com.google.android.gms:play-services-location:16.0.0'
    implementation 'org.jetbrains.anko:anko-commons:0.10.7'
    implementation "com.google.code.gson:gson:2.8.5"
    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'androidx.test:runner:1.1.0'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.1.0'
}
```

All libraries use semantic versioning
Many libraries must be kept in sync on "MAJOR"
version number

Version Identifiers

```
app_compat_version = '1.0.2'
```
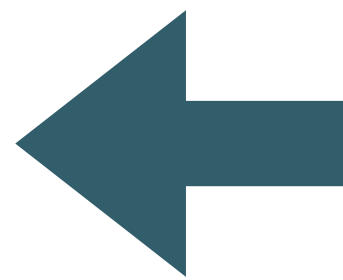
Define version in identifier

```
implementation "androidx.appcompat:appcompat:$app_compat_version"
```

```
ext {
    app_compat_version = '1.0.2'
    constraint_layout_version = '2.0.0-alpha2'
    material_version = '1.0.0'
    cardview_version = '1.0.0'
    design_library_version = '26.1.0'
    support_library_version = '26.1.0'

    play_services_maps_version = '16.0.0'
    play_services_location_version = '16.0.0'

    anko_version = '0.10.7'
    anko_commons_version = '0.10.7'
    gson_version = '2.8.5'
}
```

Mutually dependent
components aligned on
Major (at least) number

```
dependencies {
    implementation fileTree(dir: 'libs', include: ['*.jar'])
    implementation "org.jetbrains.kotlin:kotlin-stdlib-jdk7:$kotlin_version"
    implementation "androidx.appcompat:appcompat:$app_compat_version"
    implementation "androidx.constraintlayout:constraintlayout:$constraint_layout_version"
    implementation "com.google.android.material:material:$material_version"
    implementation "androidx.cardview:cardview:$cardview_version"
    implementation "com.google.android.gms:play-services-maps:$play_services_maps_version"
    implementation "com.google.android.gms:play-services-location:$play_services_location_version"
    implementation "org.jetbrains.anko:anko-commons:$anko_commons_version"
    implementation "org.jetbrains.anko:anko:$anko_version"
    implementation "com.google.code.gson:gson:$gson_version"

    testImplementation 'junit:junit:4.12'
    androidTestImplementation 'androidx.test:runner:1.1.0'
    androidTestImplementation 'androidx.test.espresso:espresso-core:3.1.0'
}
```