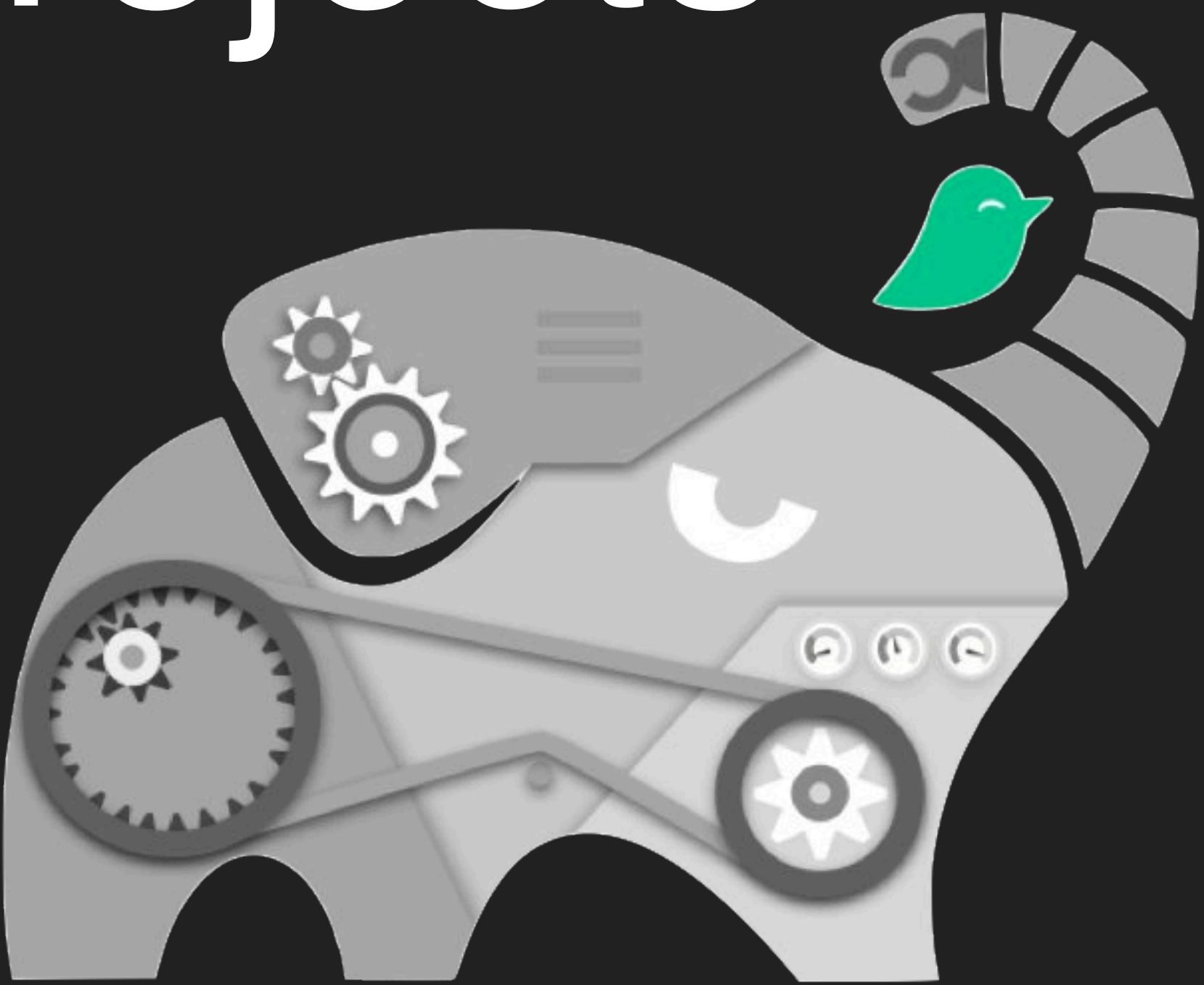


Pragmatic Gradle for your Multi-Module Projects

@CliveLeeHere





Ovia
health™

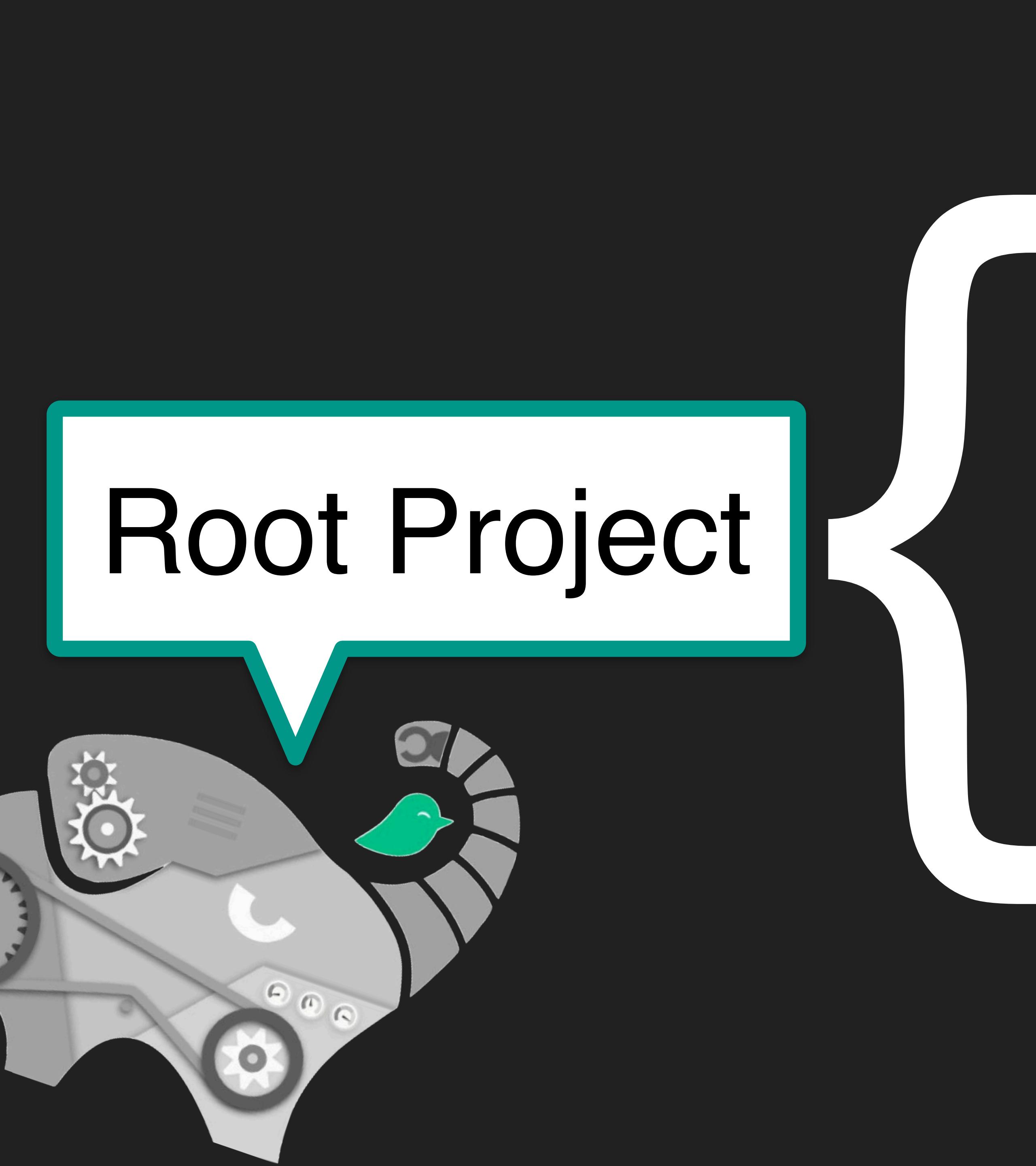
<https://www.oviahealth.com/careers>



Terminology

Project

-  **Android**
-  **Project Files**
- ▶  **app**
- ▶  **core**
- ▶  **data**
- ▶  **javalib**
- ▶  **utils**
- ▶  **Gradle Scripts**



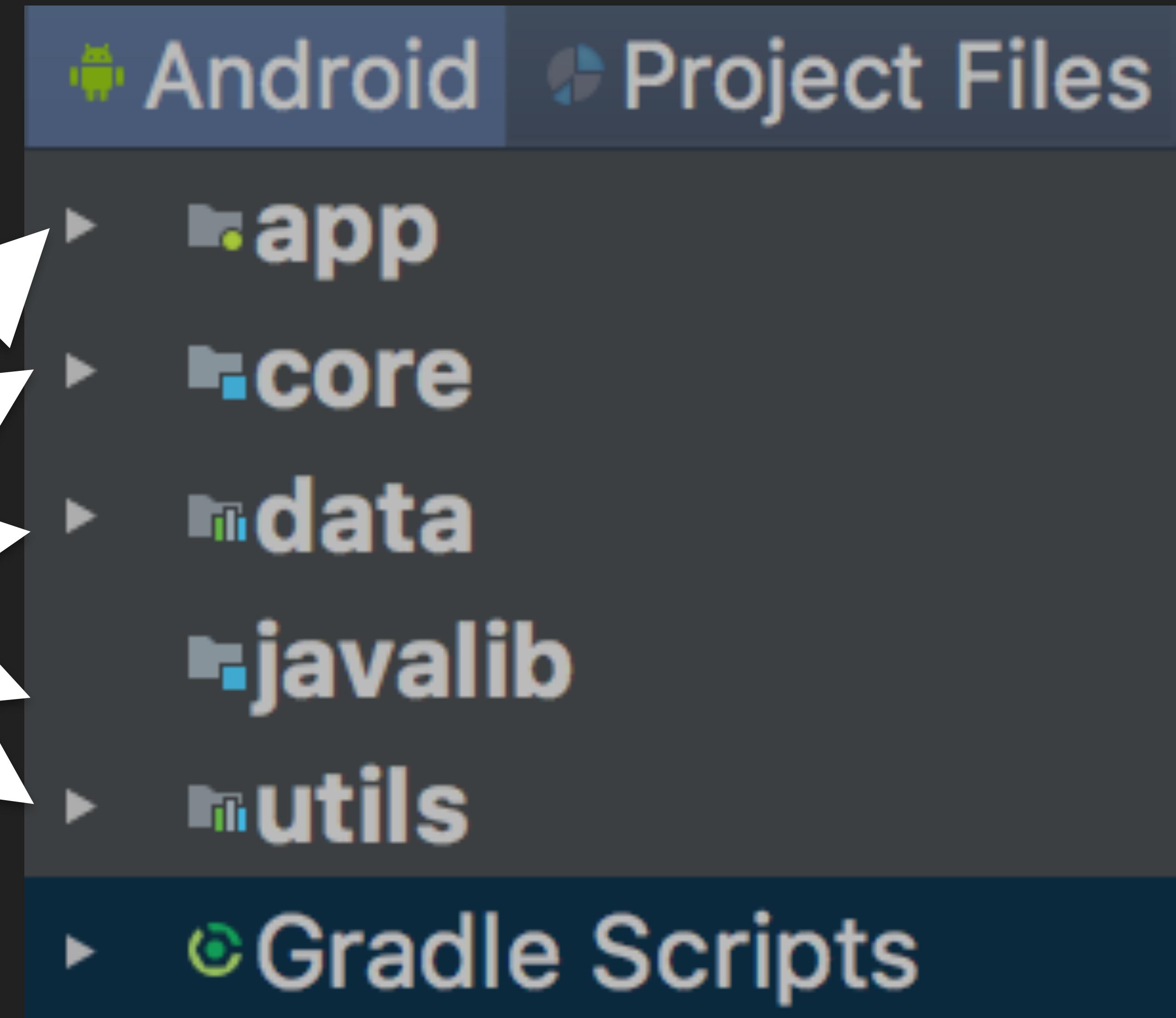
Root Project

- Android Project Files
- ▶ app
 - ▶ core
 - ▶ data
 - ▶ javalib
 - ▶ utils
 - ▶ Gradle Scripts

Project

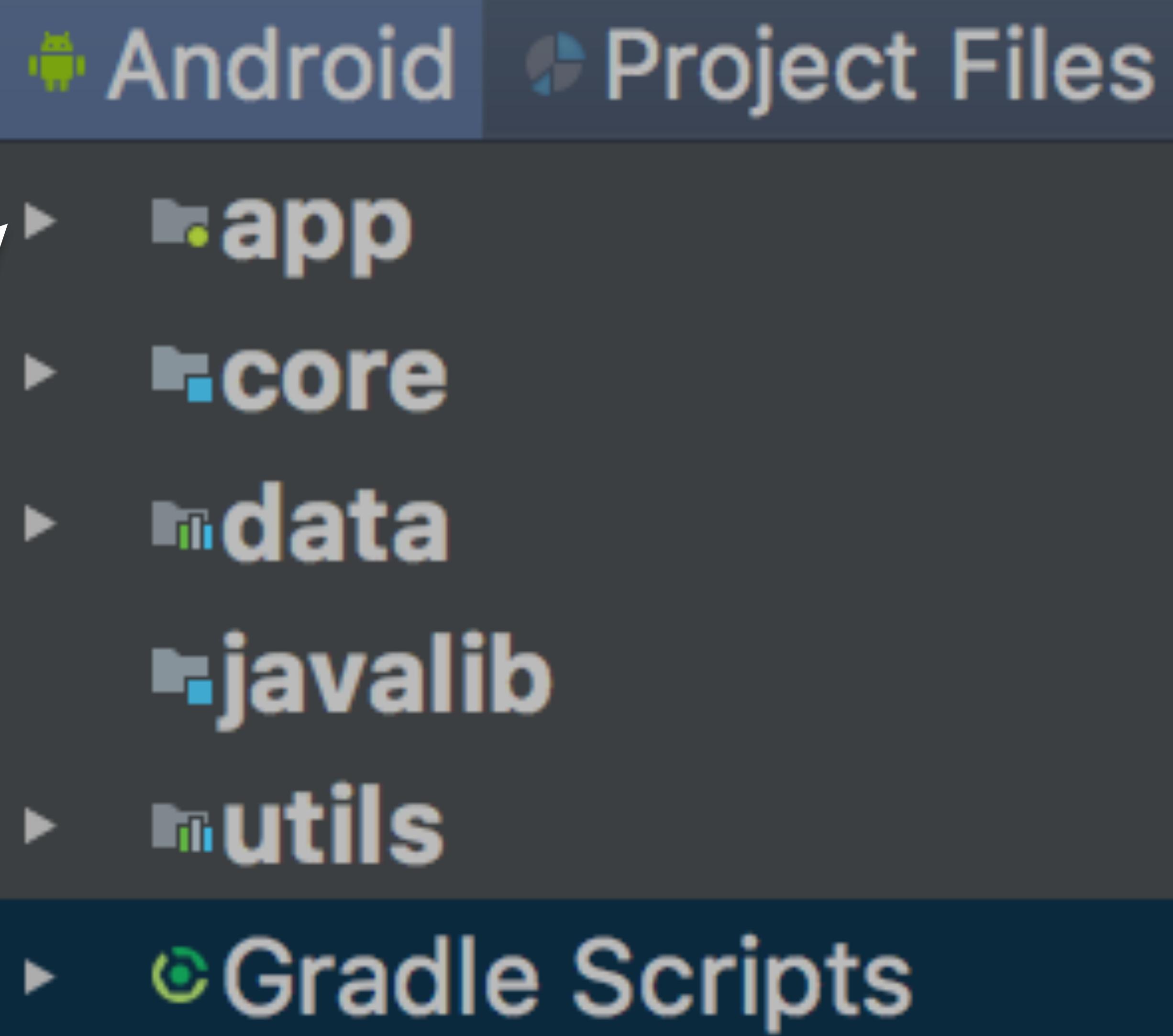
-  **Android**
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- ▶  **app**
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- ▶  **javalib**
- ▶  **utils**
- ▶  **Gradle Scripts**

Project Modules

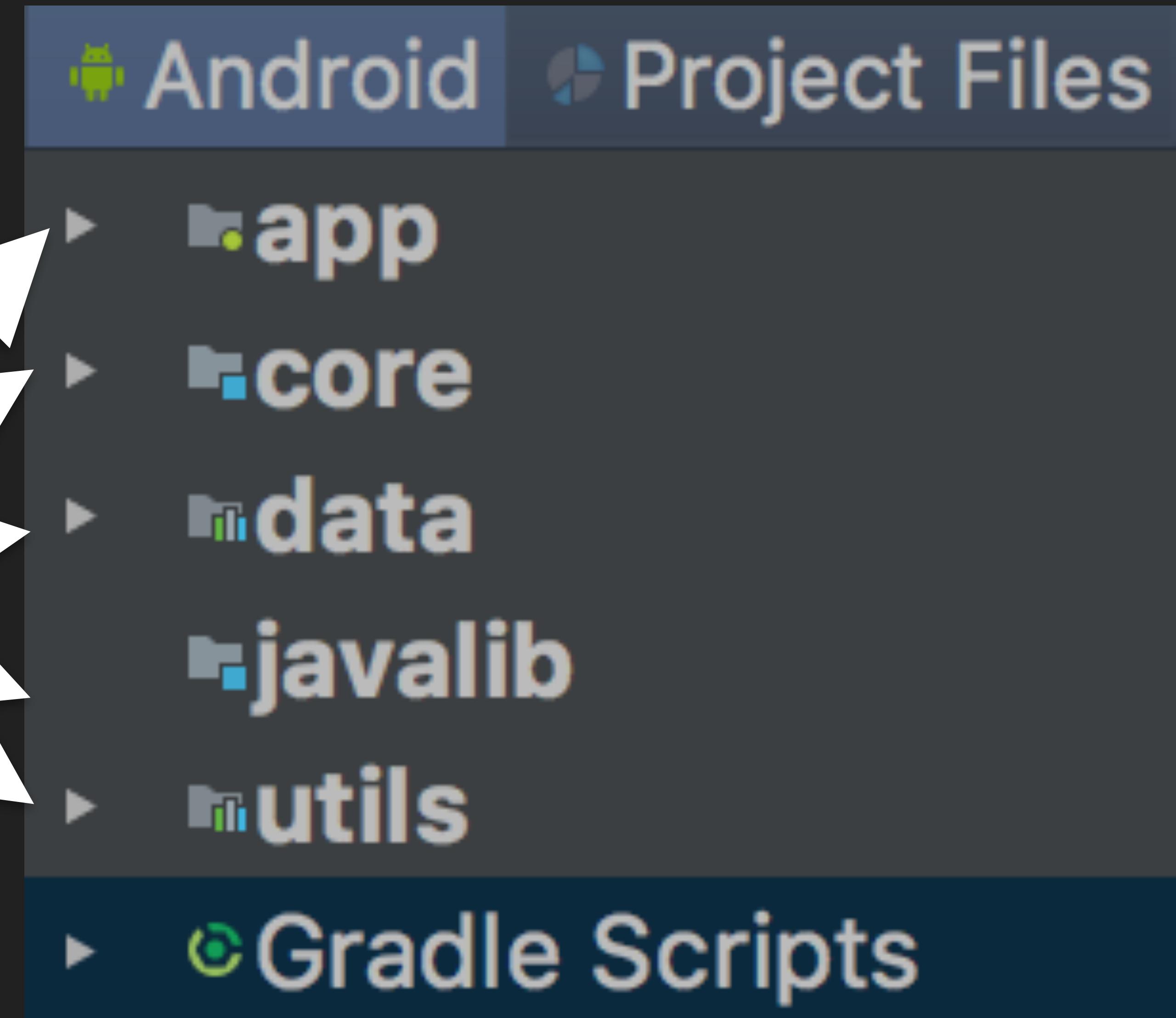
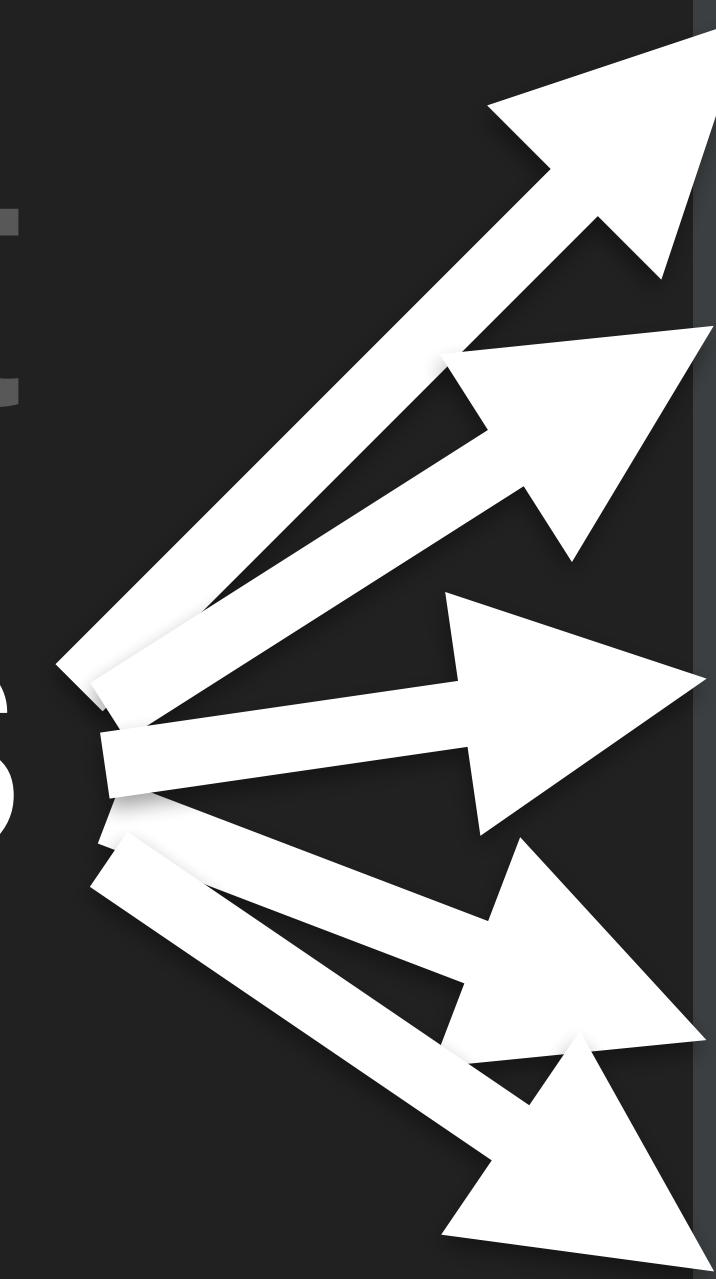


Project

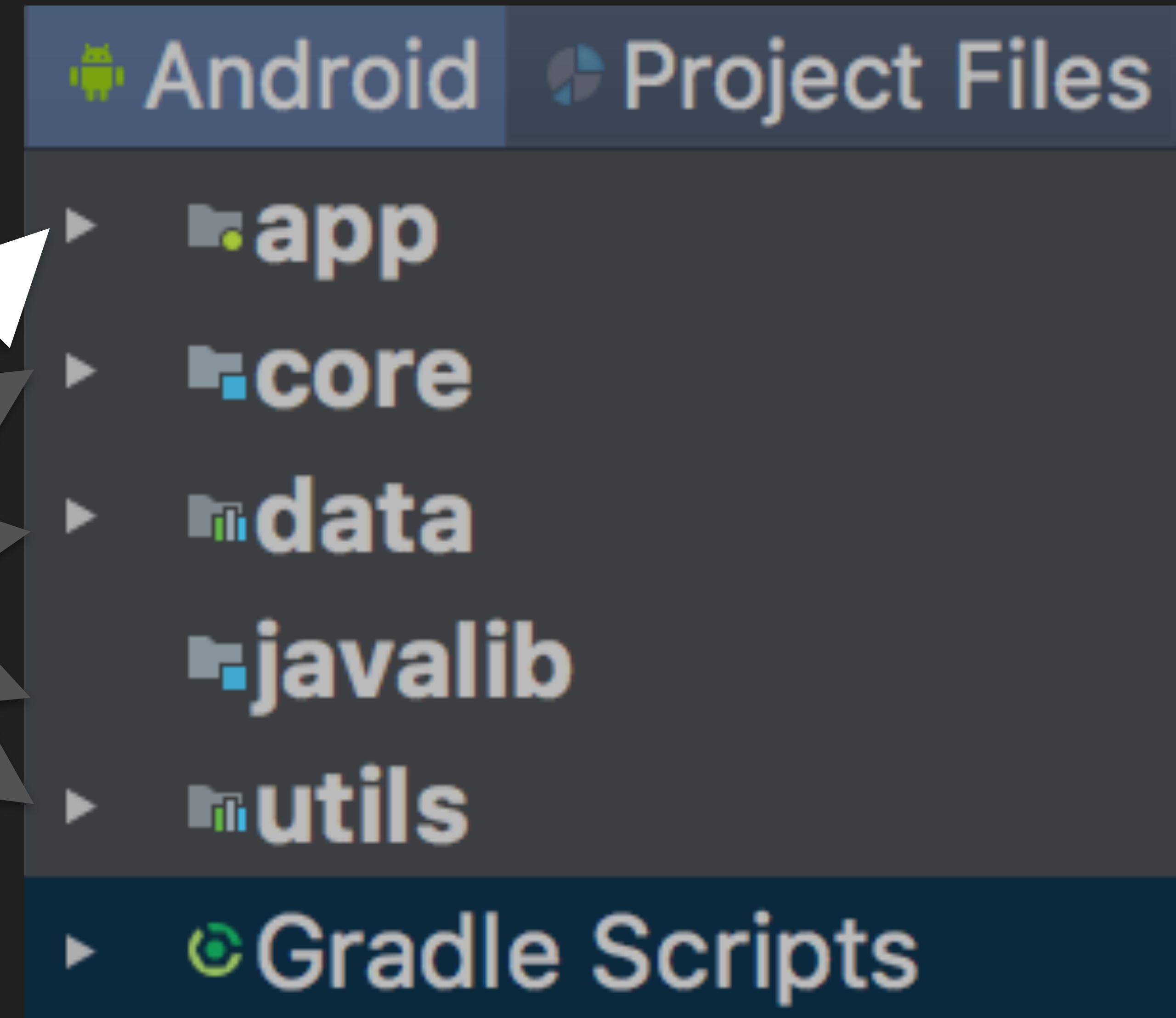
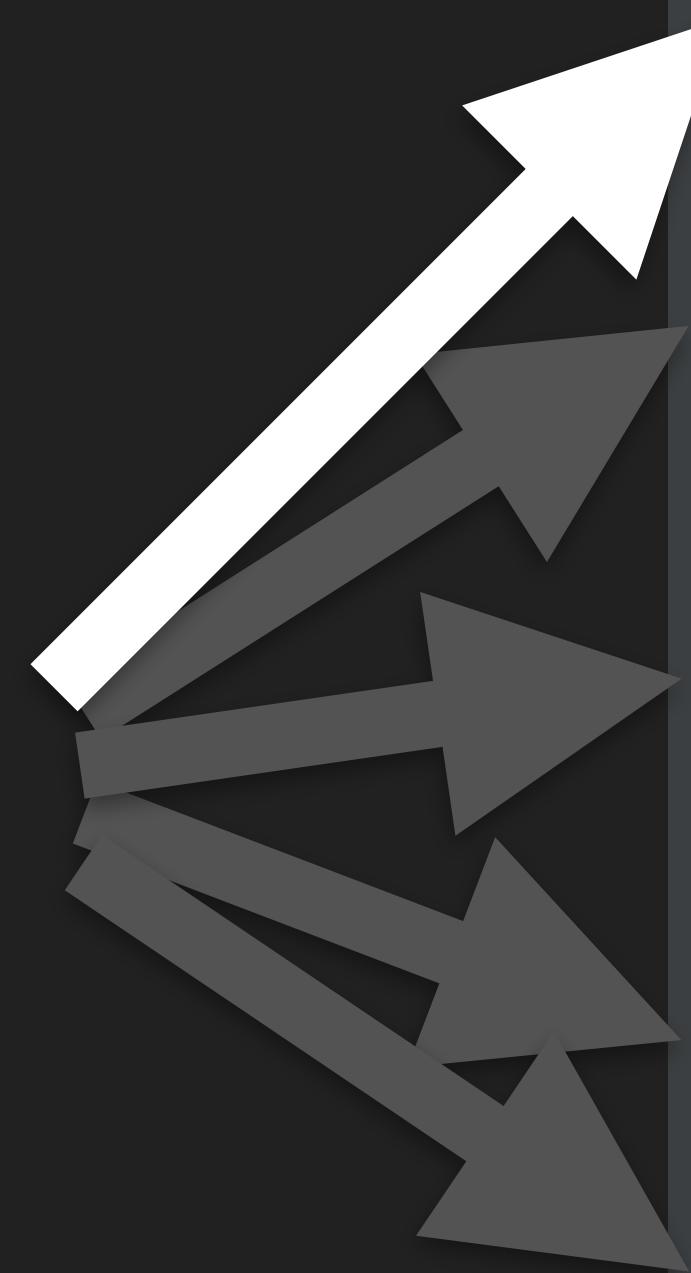
Subproject



Project Modules

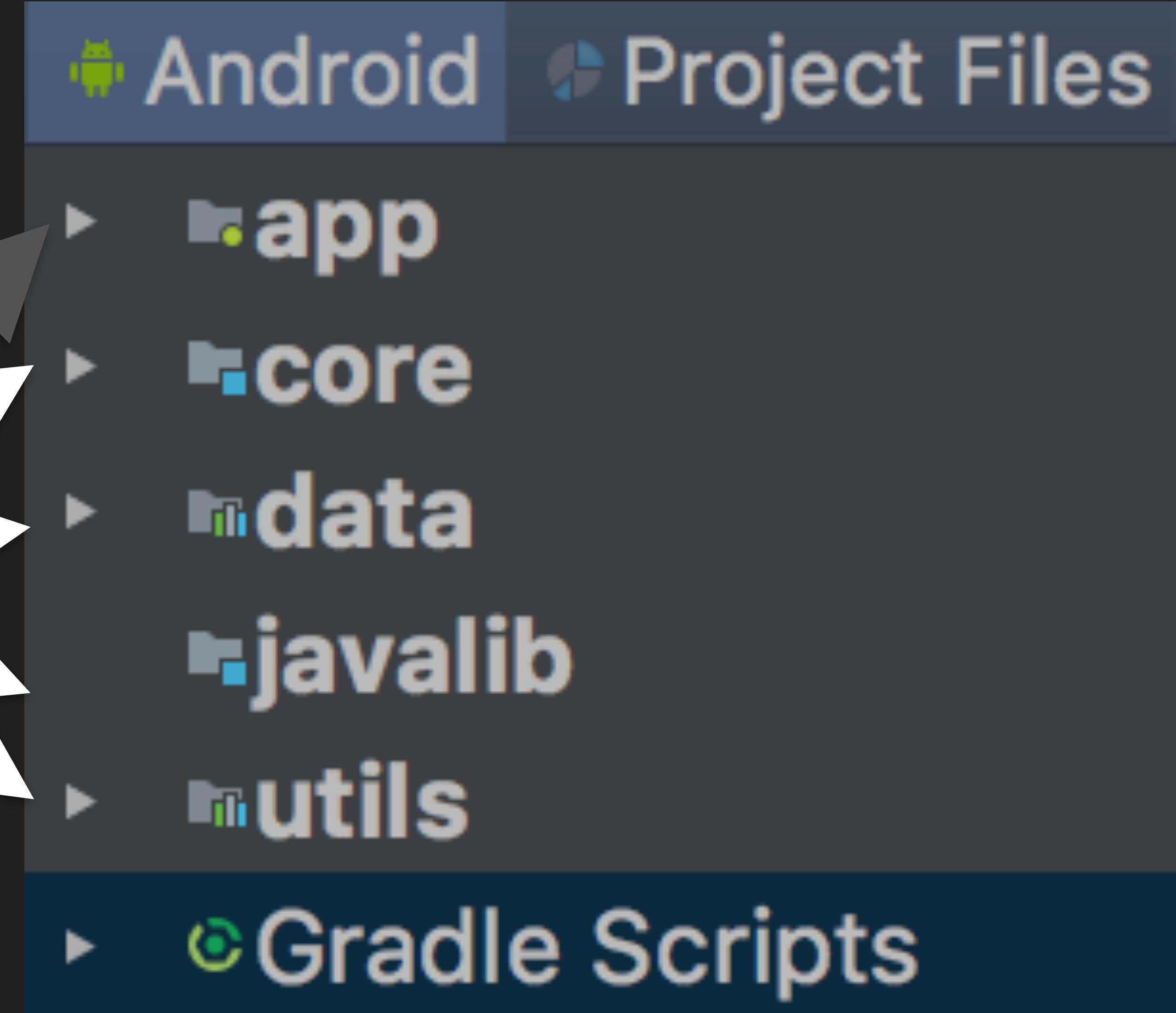
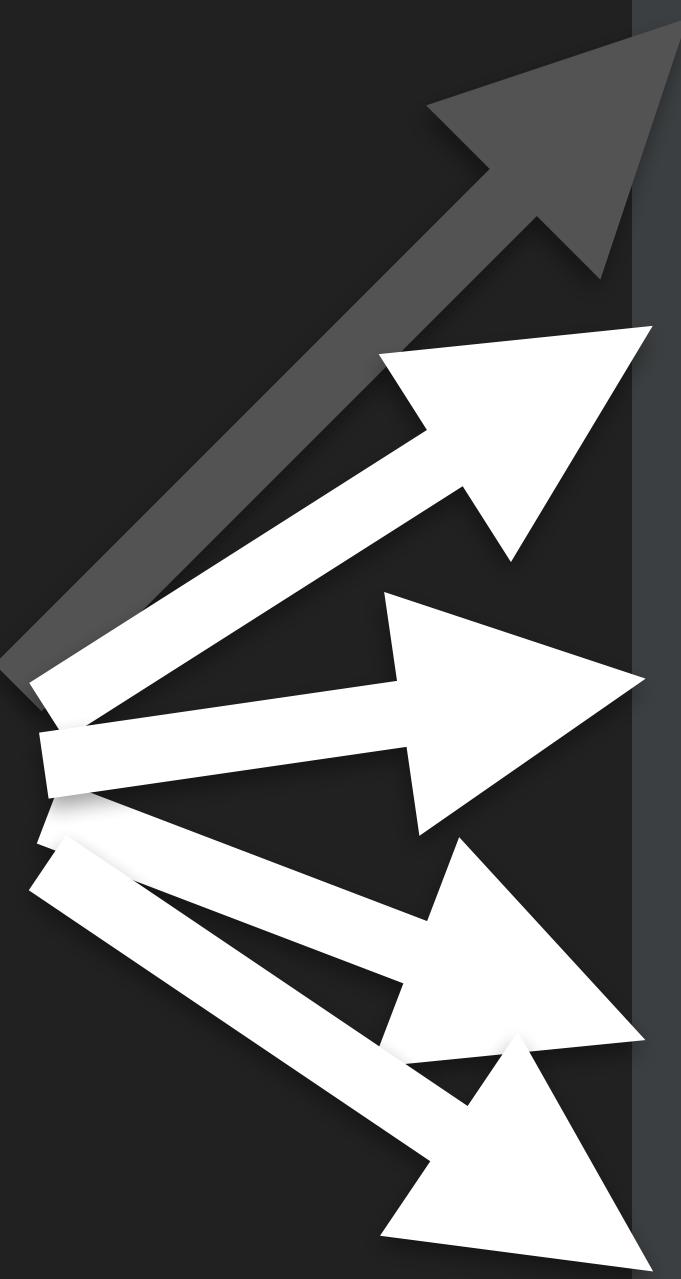


Project Modules App



Project Modules

App Libraries

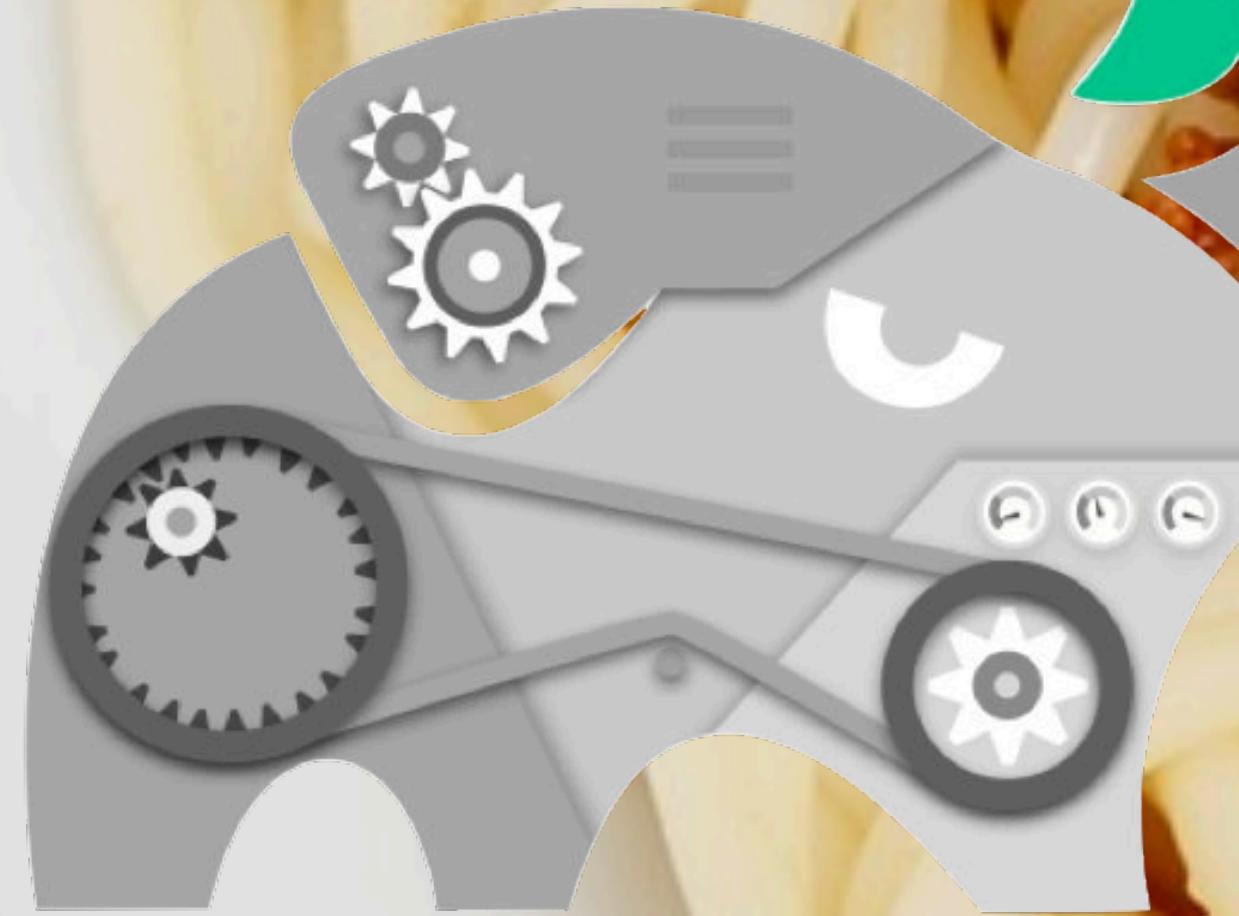


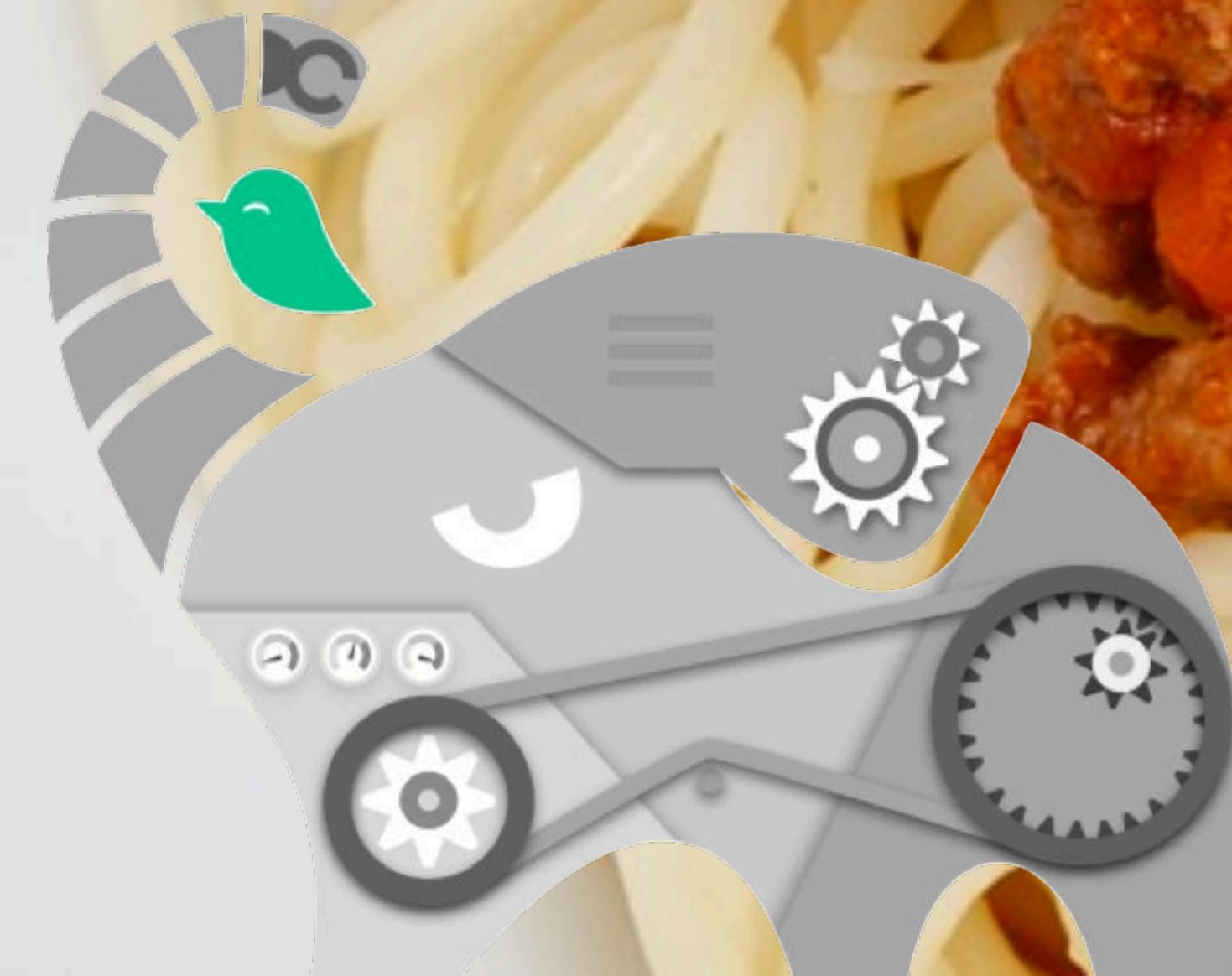
“Pragmatic”

- ▶ **app**
- ▶ **core**
- ▶ **data**
- ▶ **utils**
- ▼ **Gradle Scripts**
 - **app.gradle** (Module: app)
 - **core.gradle** (Module: core)
 - **data.gradle** (Module: data)
 - **utils.gradle** (Module: utils)
 - **gradle-wrapper.properties** (Gradle Version)
 - **gradle.properties** (Project Properties)
 - **settings.gradle** (Project Settings)
 - **local.properties** (SDK Location)



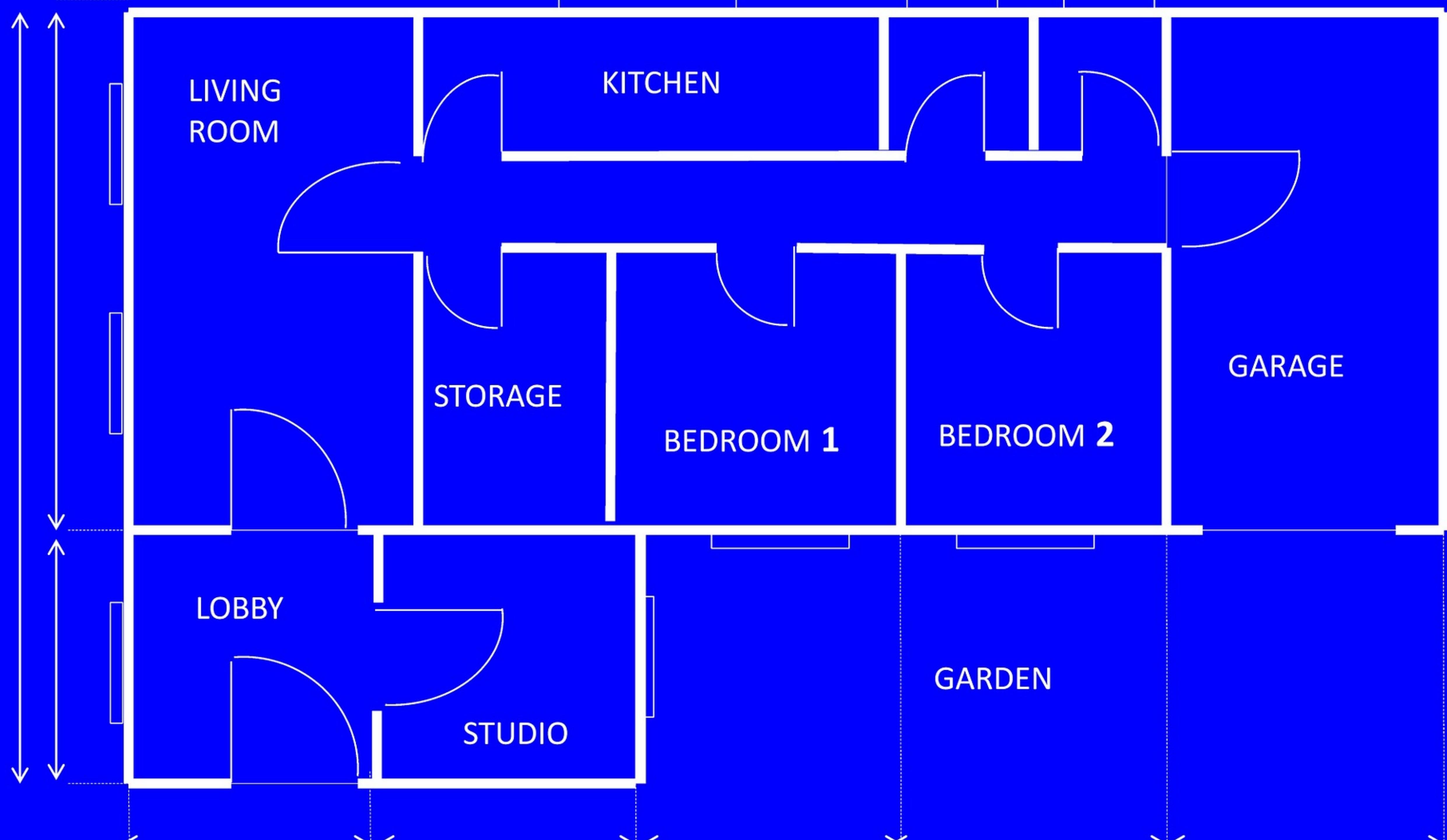


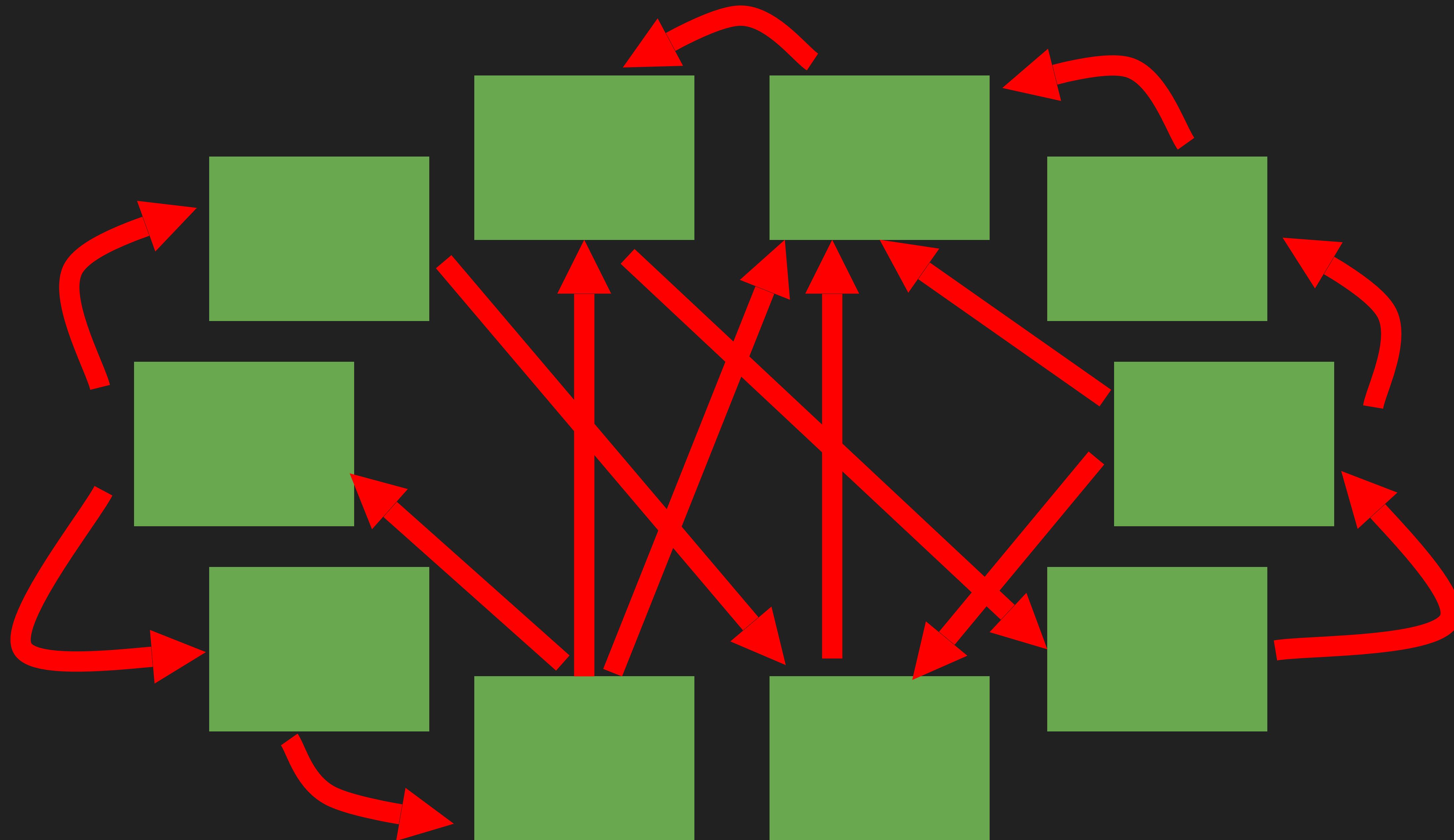




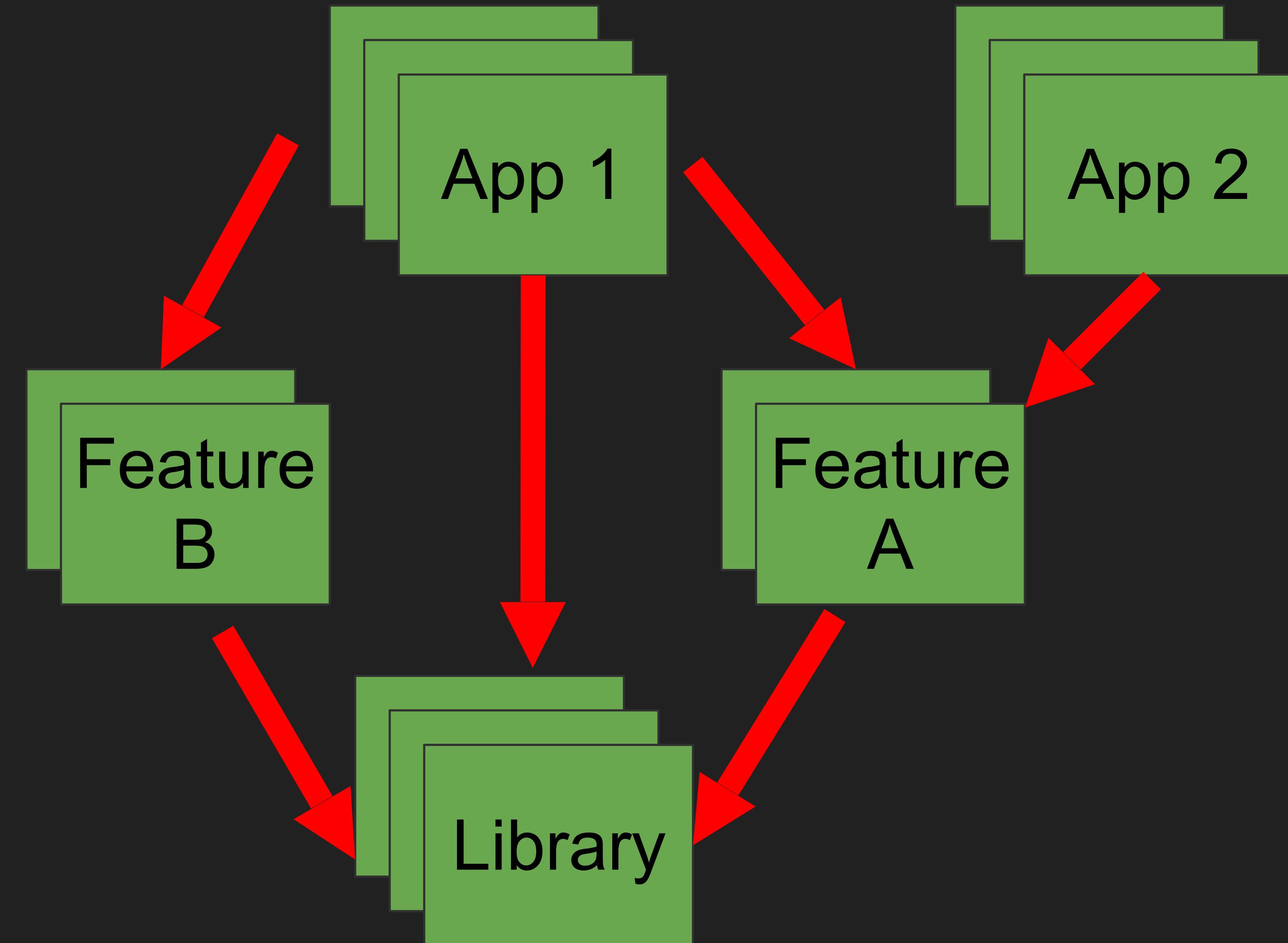


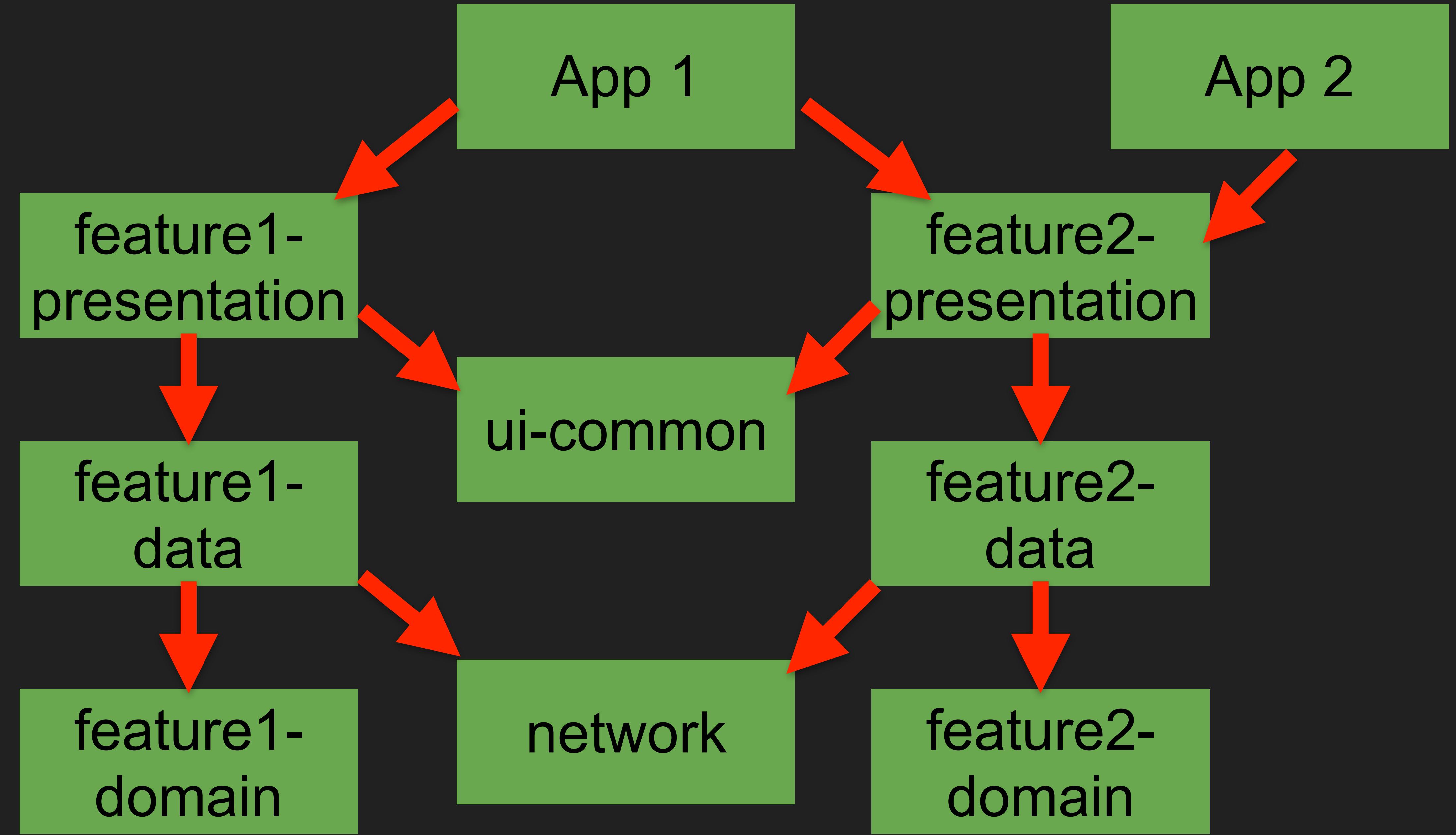
“Multi-Module”













Tips

<https://github.com/cliveleehere/multimodulegradle>

But First...

But First...

- Update Gradle (4.6)

But First...

- Update Gradle (4.6)
- Update Android Gradle Plugin (3.0.1)

But First...

- Update Gradle (4.6)
- Update Android Gradle Plugin (3.0.1)
- android-cache-fix-gradle-plugin

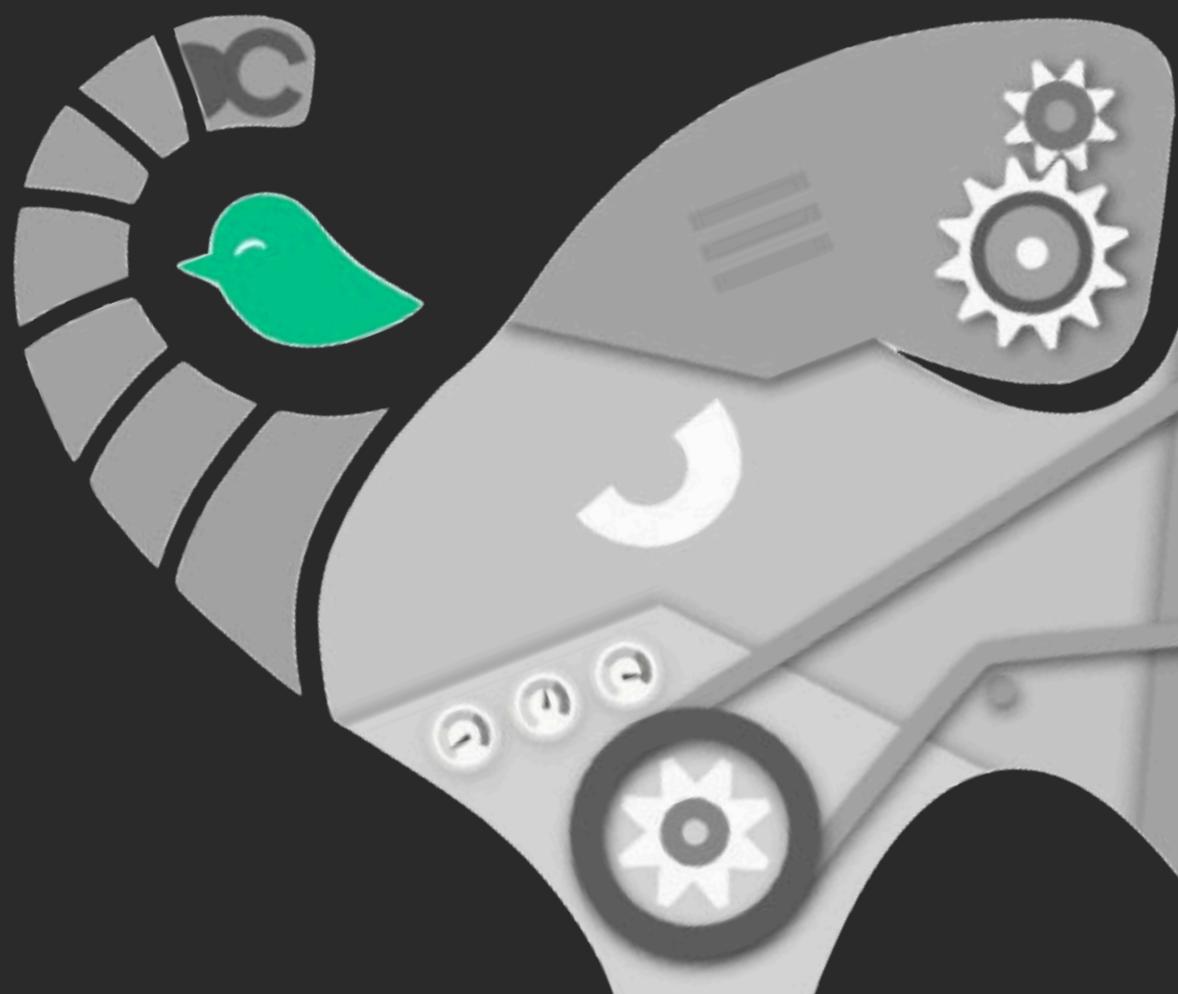
But First...

- Update Gradle (4.6)
- Update Android Gradle Plugin (3.0.1)
- android-cache-fix-gradle-plugin
- Gradle Properties

But First...

- Update Gradle (4.6)
- Update Android Gradle Plugin (3.0.1)
- android-cache-fix-gradle-plugin
- Gradle Properties

AWESOME!



Update Gradle

`./gradle-wrapper.properties`

`distributionUrl=...-4.6-all.zip`

Update Gradle

`./gradle-wrapper.properties`

`distributionUrl=...-4.6-all.zip`

or

`File > Project Structure > Project`

Android Gradle Plugin

./build.gradle

classpath

'com.android.tools.build:gradle:3.0.1'

Android Gradle Plugin

./build.gradle

classpath

'com.android.tools.build:gradle:3.0.1'

or

File > Project Structure > Project

android-cache-fix-gradle-plugin

```
./build.gradle
plugins {
    id "org.gradle.android.cache-fix"
    version "0.3.6"
}
```

Gradle.Properties

Gradle.Properties

org.gradle.parallel=true

Gradle.Properties

org.gradle.parallel=true

org.gradle.caching=true

Gradle.Properties

org.gradle.parallel=true

org.gradle.caching=true

org.gradle.configureondemand=true

Gradle.Properties

org.gradle.parallel=true

org.gradle.caching=true

org.gradle.configureondemand=true

Parallel Execution



Dependency Management

Terminology: Dependency

Terminology: Dependency

implementation

'com.google.dagger:dagger:2.15'

Terminology: Dependency

coordinates



' com.google.dagger:dagger:2.15 '

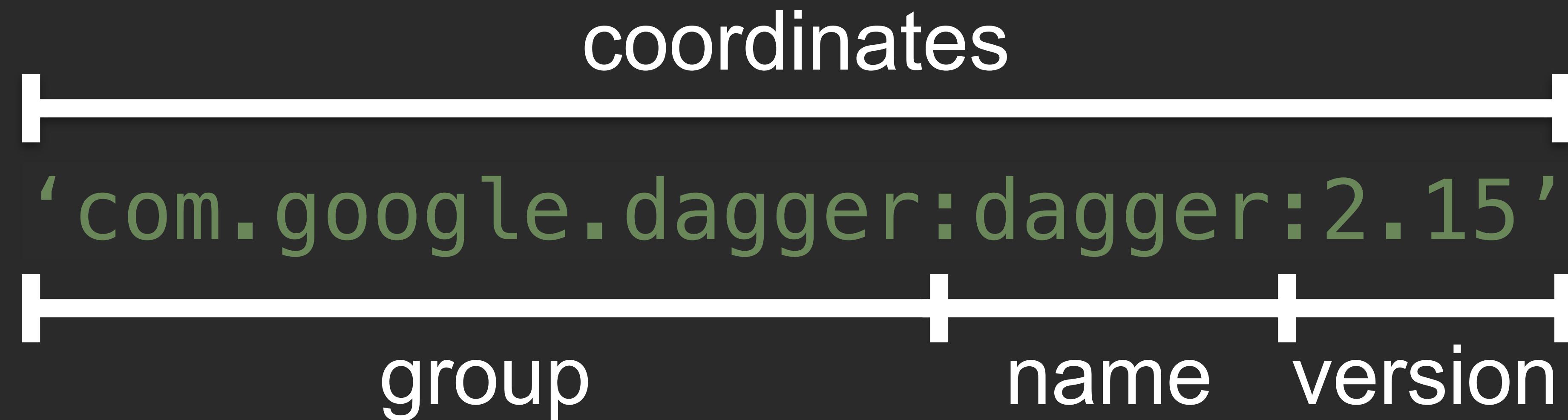
Terminology: Dependency

coordinates
`'com.google.dagger:dagger:2.15'`
group

Terminology: Dependency

coordinates
‘com.google.dagger:dagger:2.15’
group name

Terminology: Dependency



The Problem

The Problem

```
./app/build.gradle  
implementation  
'com.google.dagger:dagger:2.15'
```

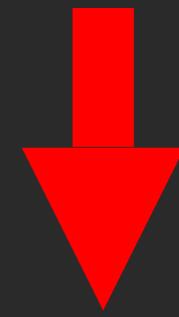
The Problem

```
./app/build.gradle  
implementation  
'com.google.dagger:dagger:2.15'
```

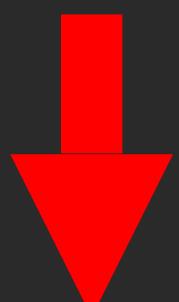
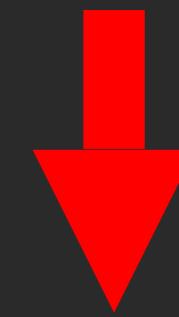
```
./lib/build.gradle  
implementation  
'com.google.dagger:dagger:2.15'
```

The Problem

```
./app/build.gradle  
implementation  
'com.google.dagger:dagger:2.15'
```



```
./lib/build.gradle  
implementation  
'com.google.dagger:dagger:2.15'  
implementation  
'com.google.dagger:dagger-android:2.15'
```





Dependency Management, part 1

Dependency Management, part 1

```
./build.gradle
ext {
    DAGGER='2.15'
}
```

Dependency Management, part 1

```
./build.gradle
ext {
    DAGGER='2.15'
}
```

```
./app/build.gradle
implementation
    "com.google.dagger:dagger:$DAGGER"
```

Dependency Management, part 1

```
./app/build.gradle  
implementation  
    "com.google.dagger:dagger:$DAGGER"
```

Dependency Management, part 1

```
./app/build.gradle  
implementation  
    "...:$rootProject.ext.daggerVersion"
```

Dependency Management, part 1

```
./app/build.gradle  
implementation  
    "...:$DAGGER_VERSION"
```

Dependency Management, part 2

Dependency Management, part 2

```
./build.gradle
ext {
    DAGGER_VERSION='2.15'
    dagger="com.google.dagger:dagger:
    $DAGGER_VERSION"
}
```

Dependency Management, part 2

```
./build.gradle
ext {
    DAGGER_VERSION='2.15'
    dagger="com.google.dagger:dagger:$DAGGER_VERSION"
}
```

```
./app/build.gradle
implementation
rootProject.ext.dagger
```

Dependency Management, part 2

rootProject.ext.dagger

Dependency Management, part 2

rootProject.dagger

Dependency Management, part 2

dagger

Dependency Management, part 2

daggerLibrary

Dependency Management, part 3

Dependency Management, part 3

```
./versions.gradle
```

```
./build.gradle
```

```
./app/build.gradle
```

Dependency Management, part 3

```
./versions.gradle  
ext.deps = [:]
```

Dependency Management, part 3

```
./versions.gradle
ext.deps = [:]
def versions = [:]
versions.dagger = "2.15"
```

Dependency Management, part 3

```
./versions.gradle
ext.deps = [:]
def versions = [:]
versions.dagger = "2.15"
def deps = [:]
def dagger = [:]
dagger.runtime =
"com.google.dagger:dagger$versions.dagger"
```

Dependency Management, part 3

```
./versions.gradle
ext.deps = [:]
def versions = [:]
versions.dagger = "2.15"
def deps = [:]
def dagger = [:]
dagger.runtime =
    "com.google.dagger:dagger${versions.dagger}"
deps.dagger = dagger
ext.deps = deps
```

Dependency Management, part 3

```
./versions.gradle
```

```
./build.gradle
```

```
./app/build.gradle
```

Dependency Management, part 3

```
./build.gradle
buildscript {
    apply from: './versions.gradle'
}
```

Dependency Management, part 3

```
./versions.gradle
```

```
./build.gradle
```

```
./app/build.gradle
```

Dependency Management, part 3

```
./app/build.gradle
dependencies {
    implementation deps.dagger.runtime
```

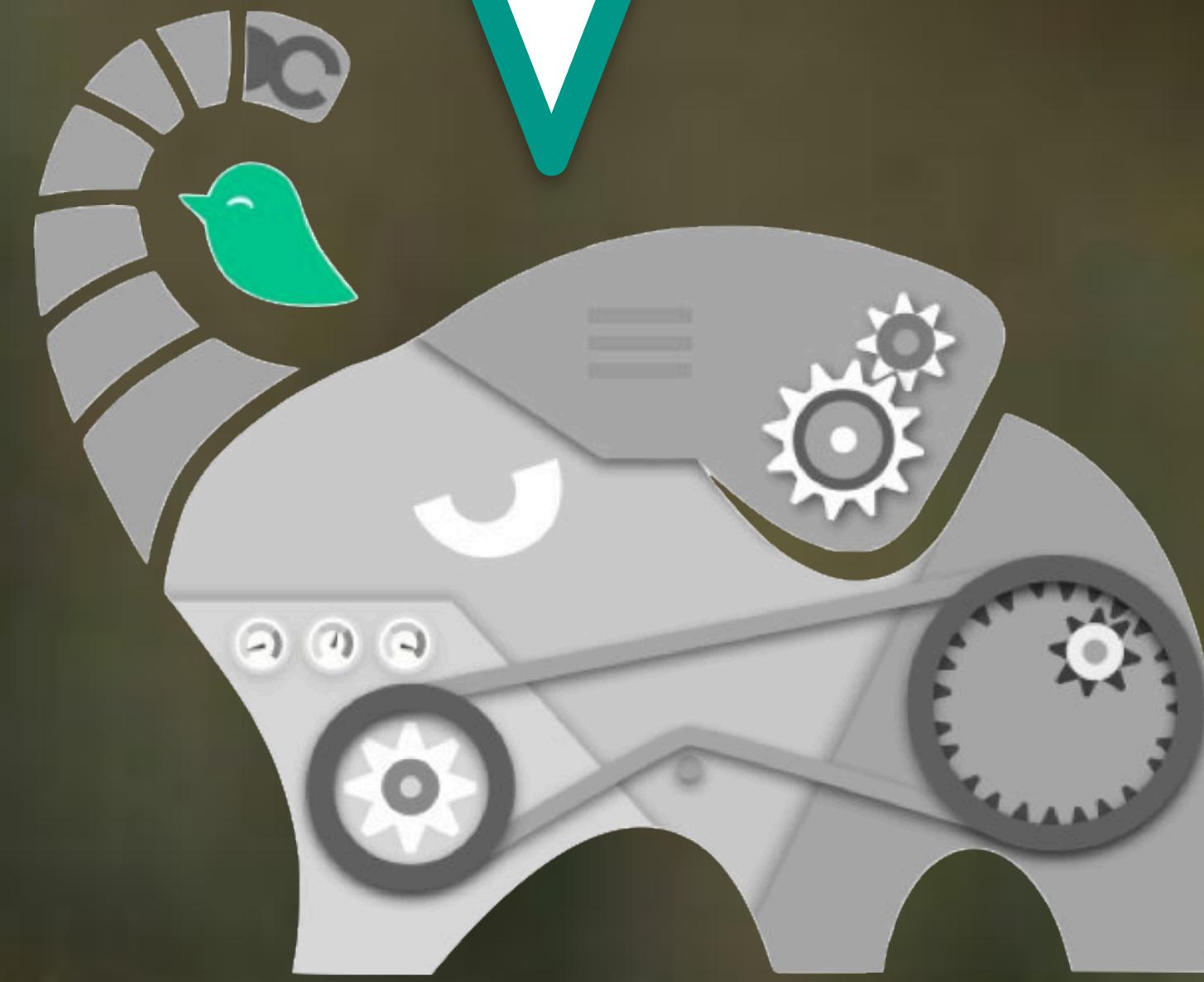
WHAT IF I TOLD YOU...



WHAT IF I TOLD YOU...



WOA!



Dependency Management, part 4

```
./buildSrc/src/main/java/..../Deps.java
```

Dependency Management, part 4

```
./buildSrc/src/main/java/.../Deps.java
package com.example.gradle;

public class Deps {
    public static final String guava =
        "com.google.guava:guava:18.0";
}
```

Dependency Management, part 4

```
./buildSrc/src/main/java/./Deps.java
```

```
./app/build.gradle
import com.example.Deps;

dependencies {
    implementation Deps.guava
```

Dependency Management, part 5

Dependency Management, part 5

```
./buildSrc/src/main/java/./Deps.kt
object Libs {
    val guava =
        "com.google.guava:guava:18.0"
```

Dependency Management, part 5

```
./buildSrc/src/main/java/..../Deps.kt
```

```
./buildSrc/build.gradle.kts
plugins {
    `kotlin-dsl`
}
```

Other Constants

Other Constants

```
./build.gradle  
ext {  
    minSdkVersion = 18
```

Other Constants

```
./build.gradle
```

```
./versions.gradle
def build_versions = [:]
build_versions.minSdk = 14
ext.build_versions = build_versions
```

Other Constants

```
./build.gradle
```

```
./versions.gradle
```

```
./buildSrc/src/main/java/.../Deps.java
public class Deps {
    public static final String minSdk =
        "14";
```


Sharing





YUM!



```
apply plugin: 'kotlin-kapt'
```

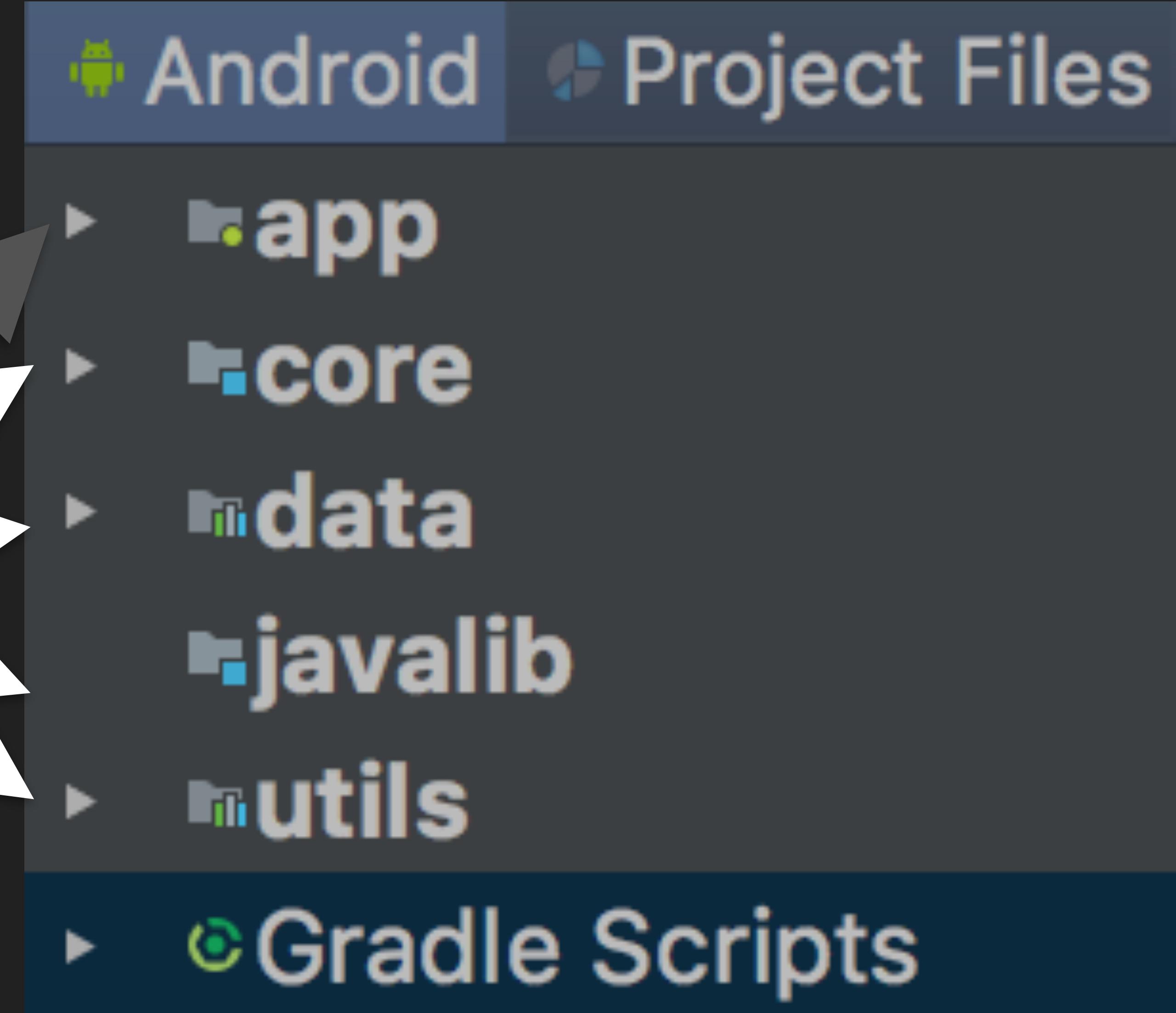
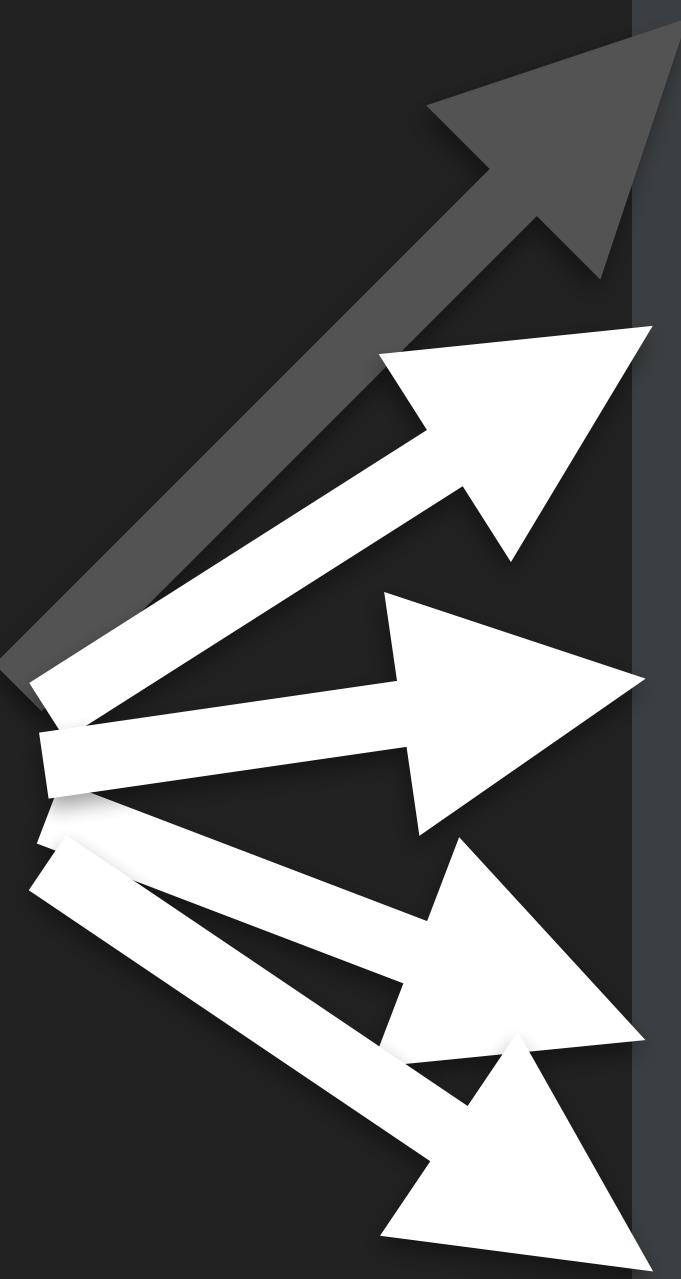
```
apply plugin: 'kotlin-kapt'
```

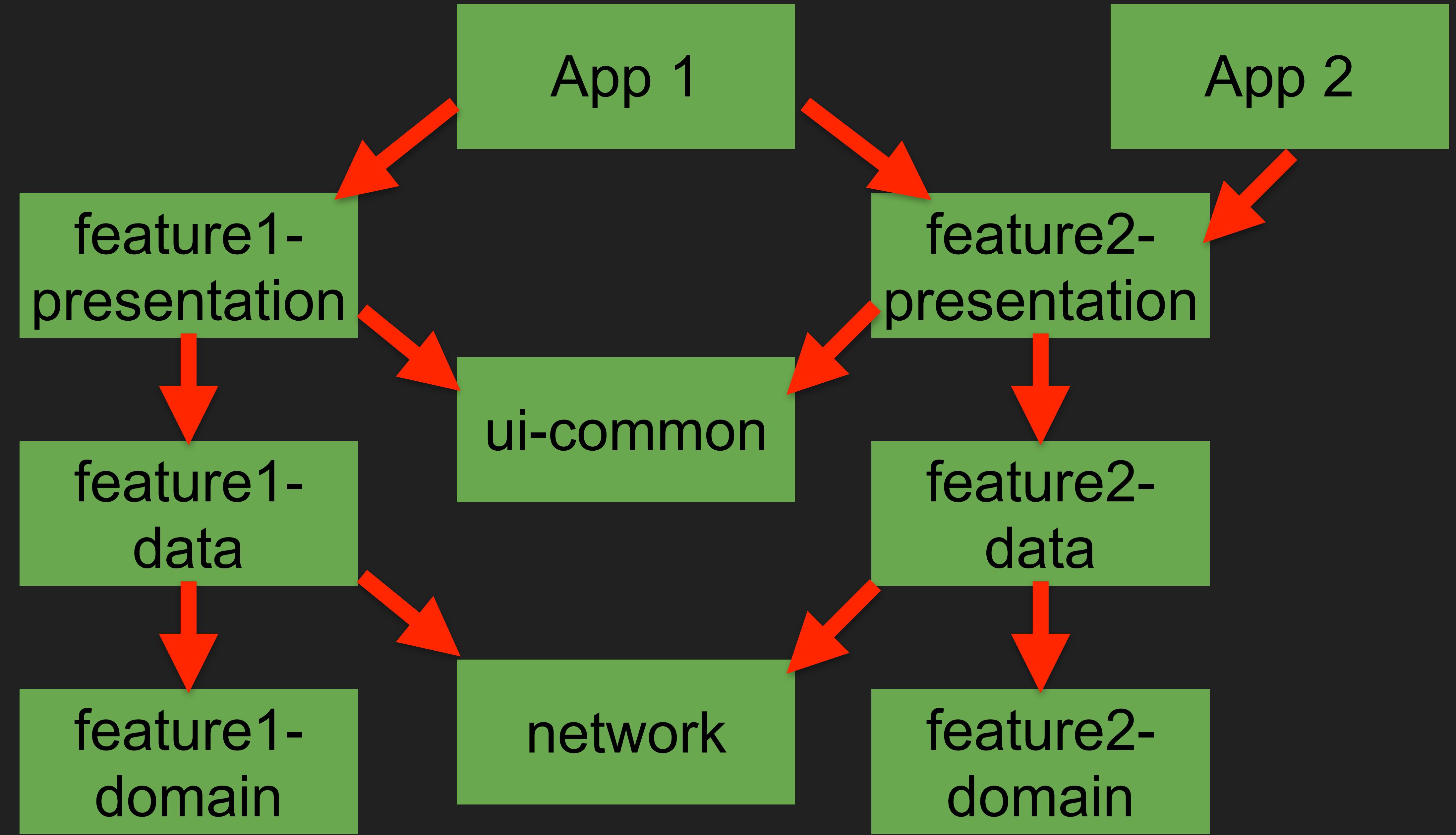
```
apply from: "./versions.gradle"
```

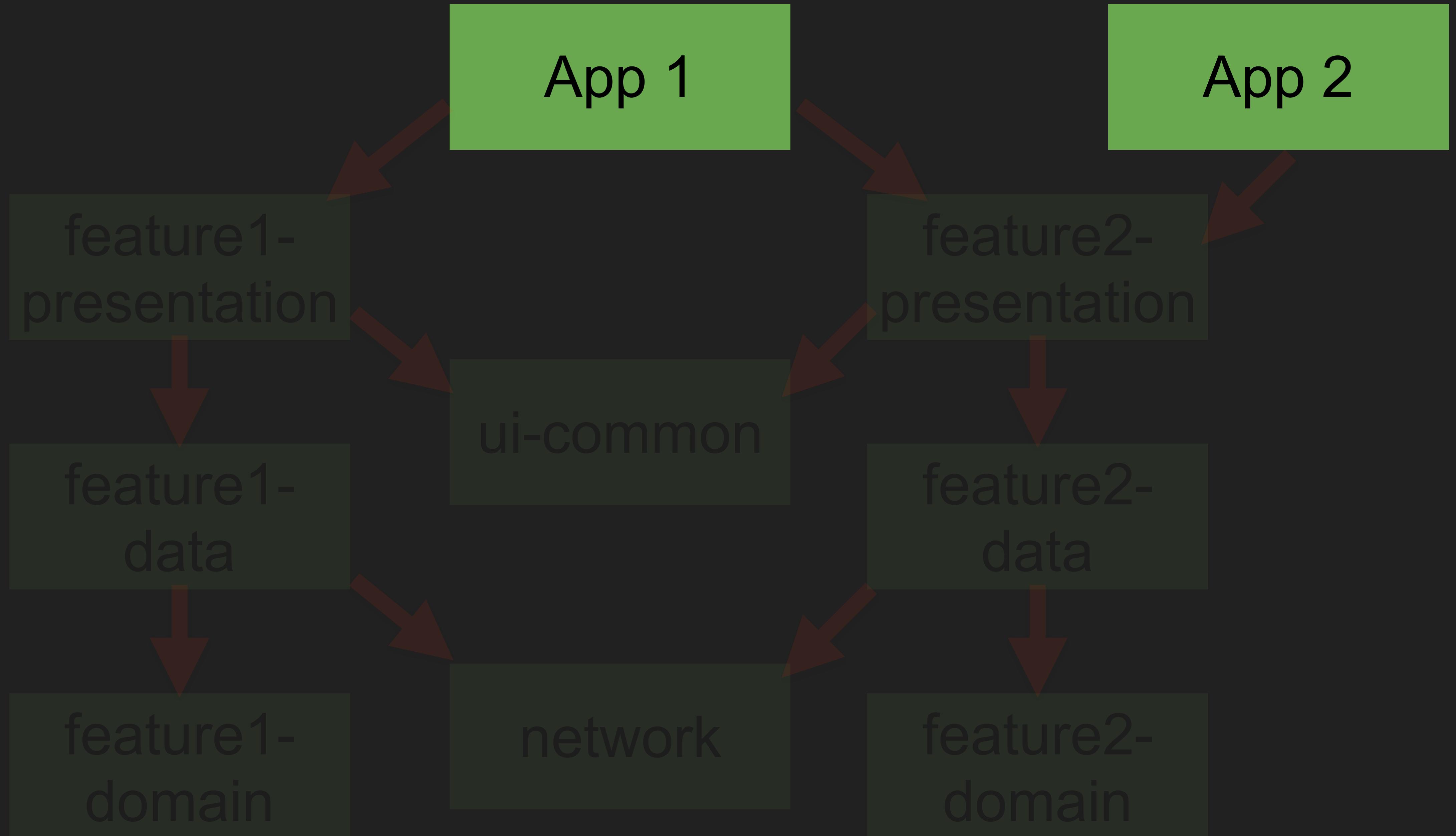
```
apply from: "./versions.gradle"
```

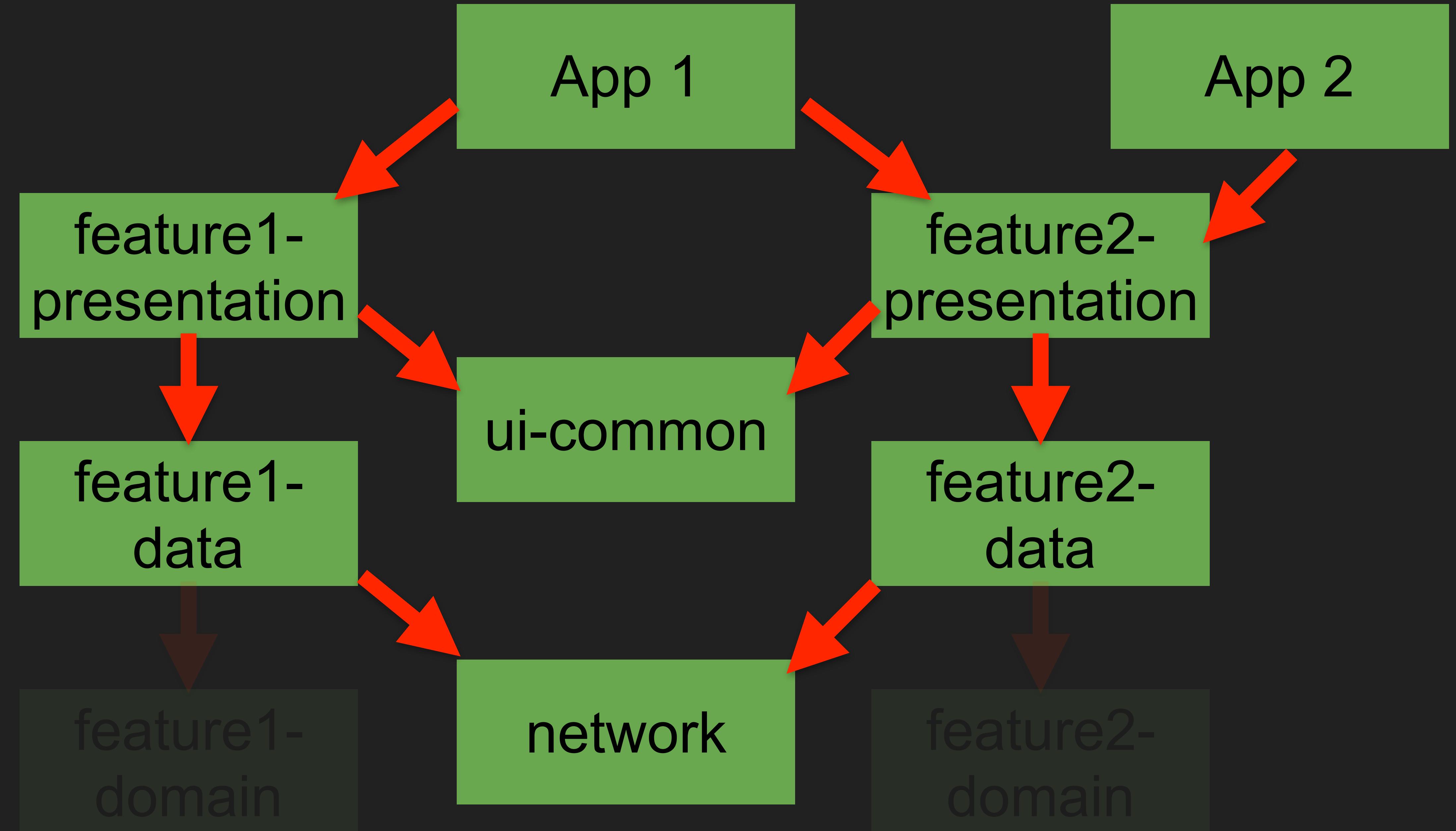
Project Modules

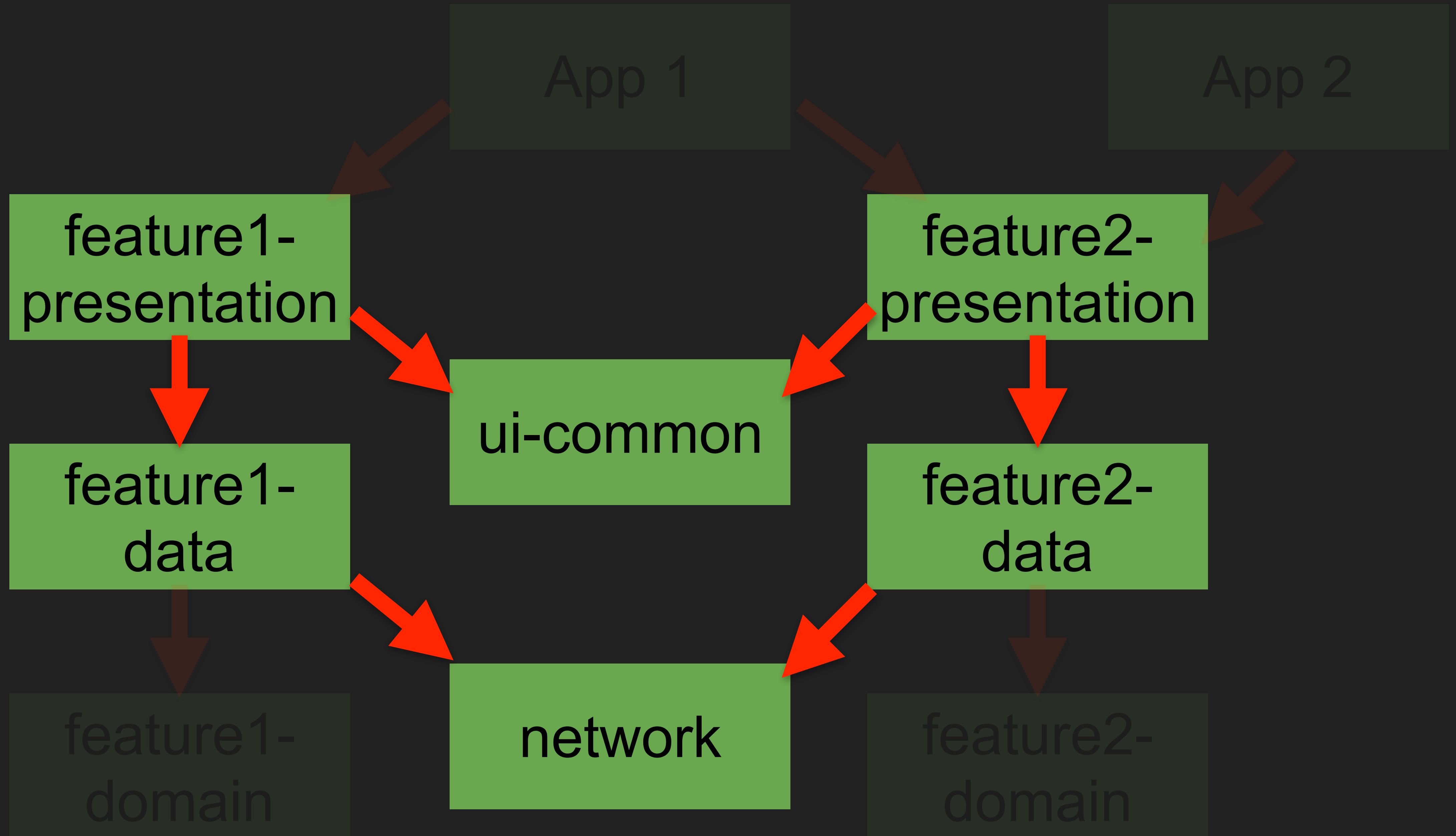
App Libraries

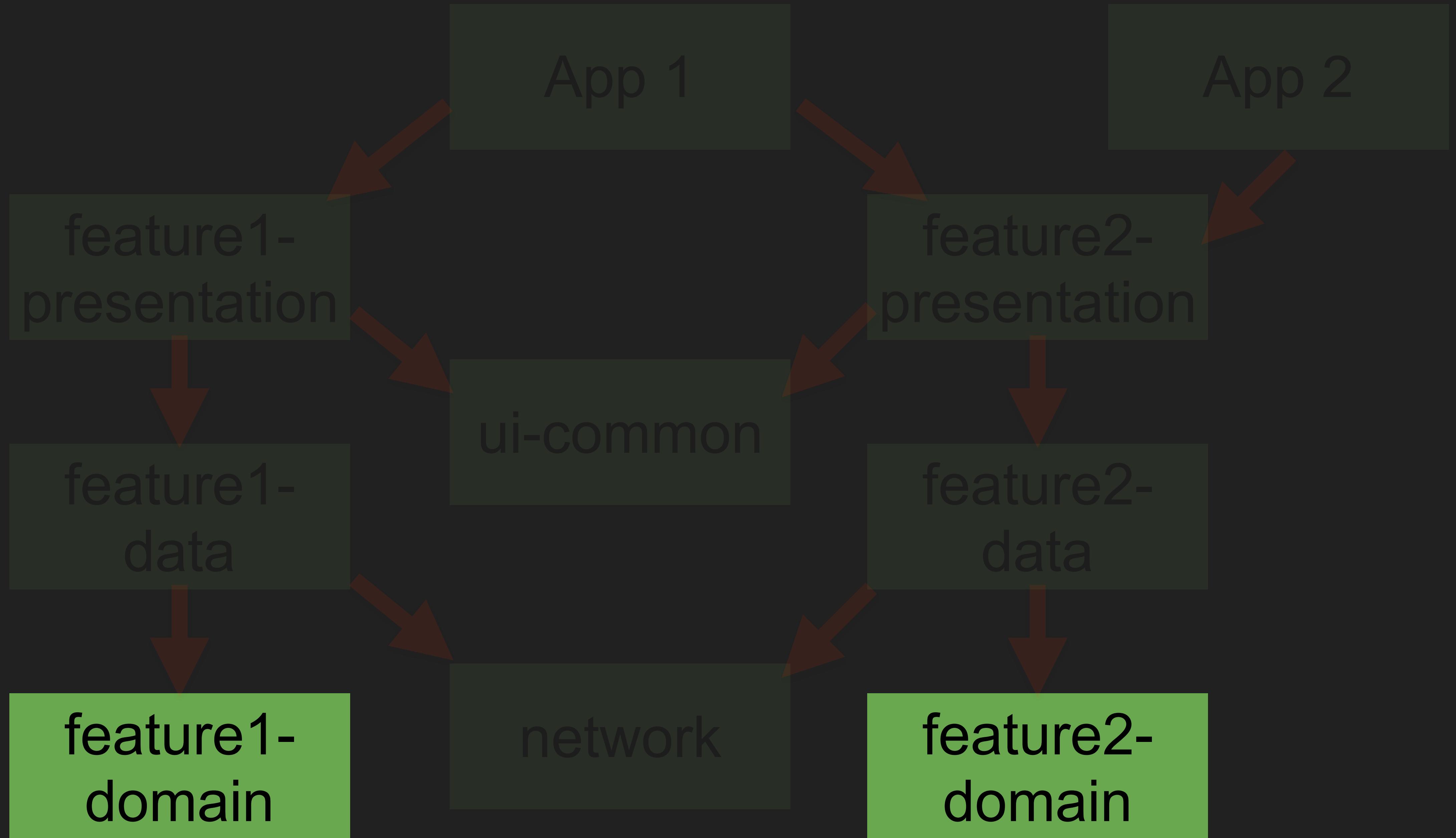












feature1-
domain

feature2-
domain

feature1-
domain

feature2-
domain

```
./f1-domain/  
build.gradle
```

```
dependencies {  
    ...  
}
```

feature1-
domain

```
./f1-domain/  
build.gradle
```

```
dependencies {  
    ...  
}
```

feature2-
domain

```
./f2-domain/  
build.gradle
```

```
dependencies {  
    ...  
}
```

feature1-
domain

```
./f1-domain/  
build.gradle
```

```
apply from:  
"/shared-  
domain.gradle"
```

feature2-
domain

```
./f2-domain/  
build.gradle
```

```
dependencies {  
    ...  
}
```

feature1- domain

```
./f1-domain/  
build.gradle
```

```
apply from:  
"/shared-  
domain.gradle"
```

feature2- domain

```
./f2-domain/  
build.gradle
```

```
apply from:  
"/shared-  
domain.gradle"
```

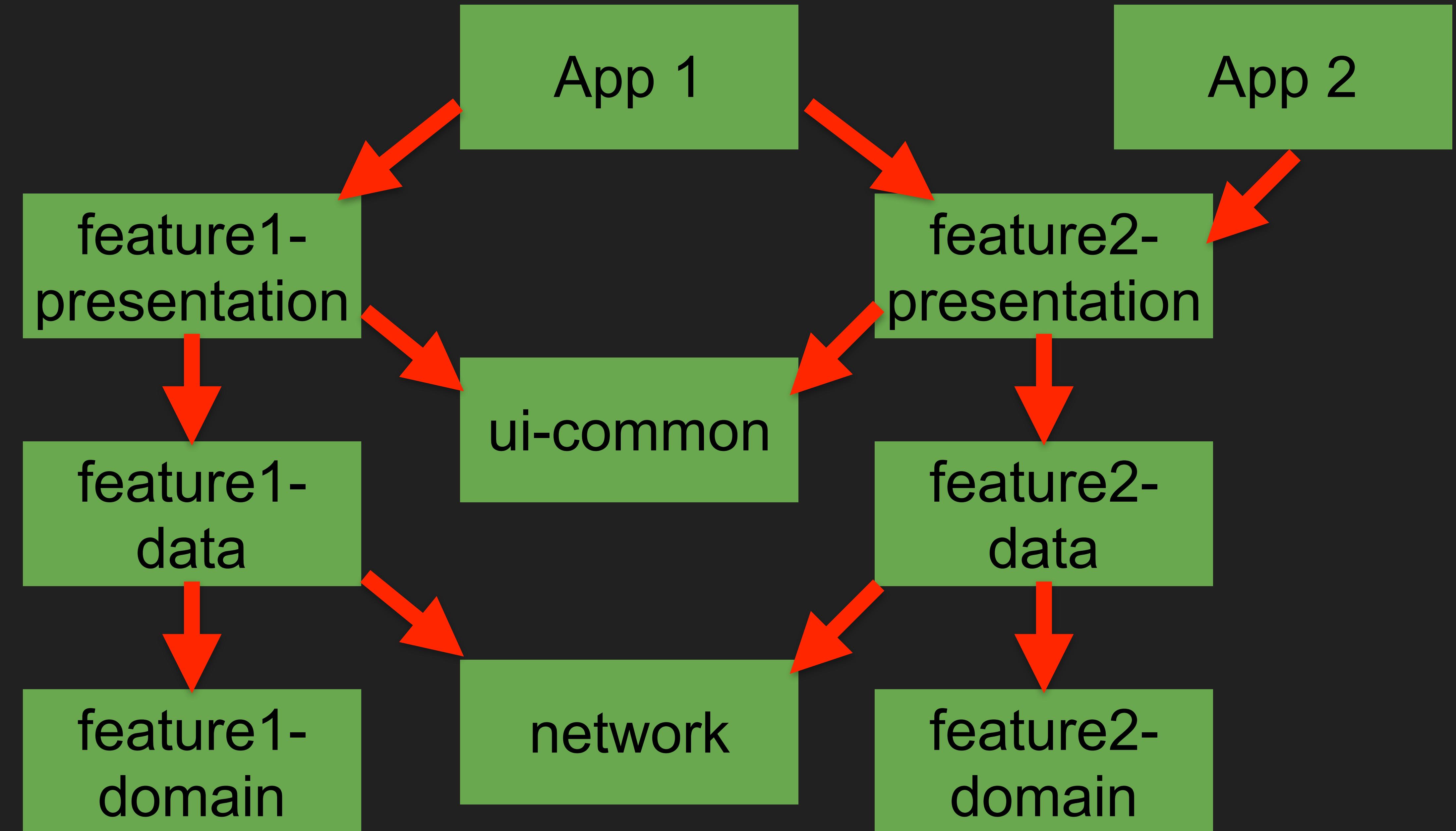
feature1-
domain

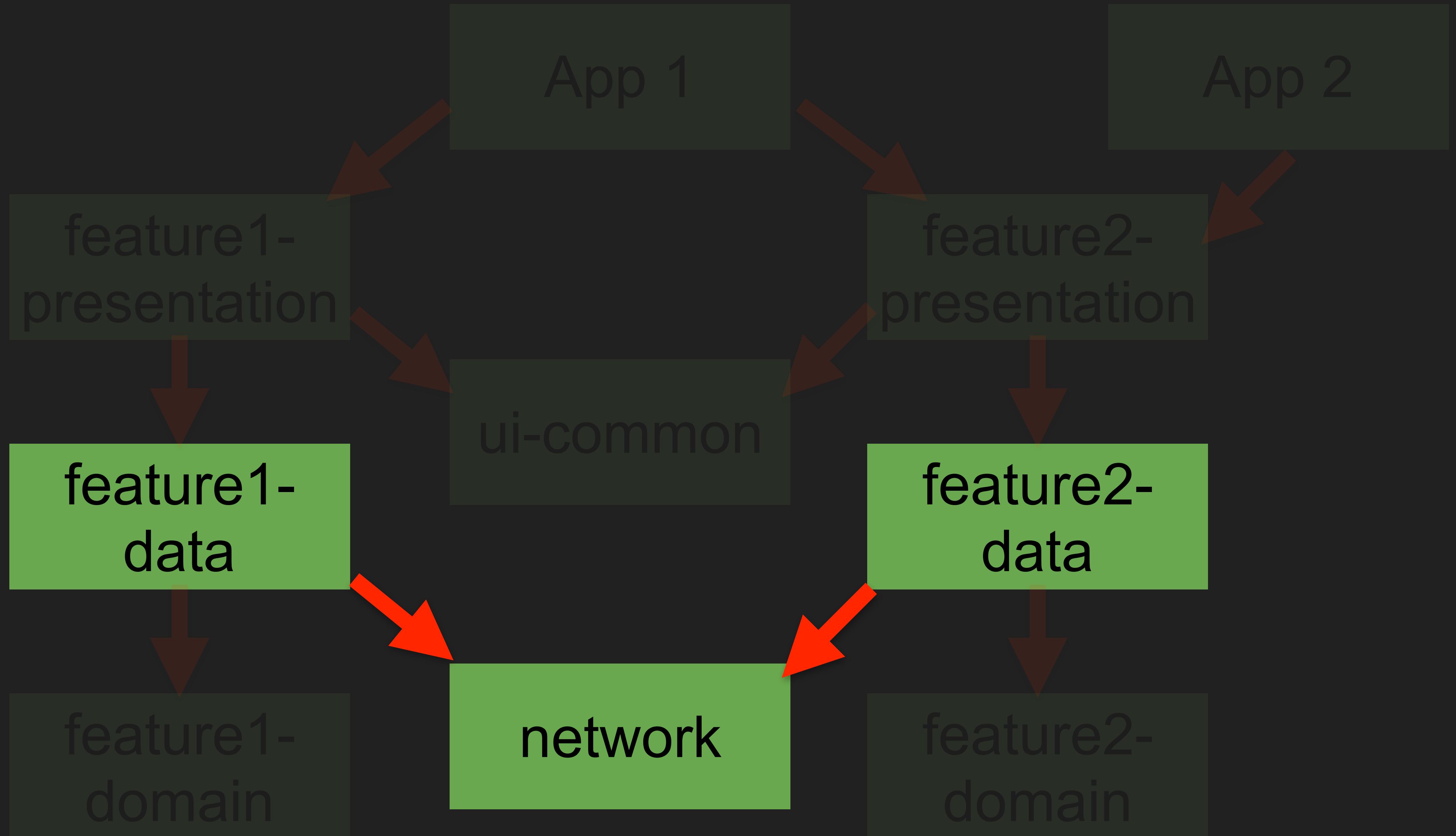
feature2-
domain

```
./f1-domain/  
build.gradle
```

```
./f2-domain/  
build.gradle
```

```
./shared-domain.gradle  
dependencies {  
    ...  
}
```





feature1-
data

network

feature2-
data

./.../build.gradle

```
apply from: "../shared-domain.gradle"
apply from: "../shared-data.gradle"
```

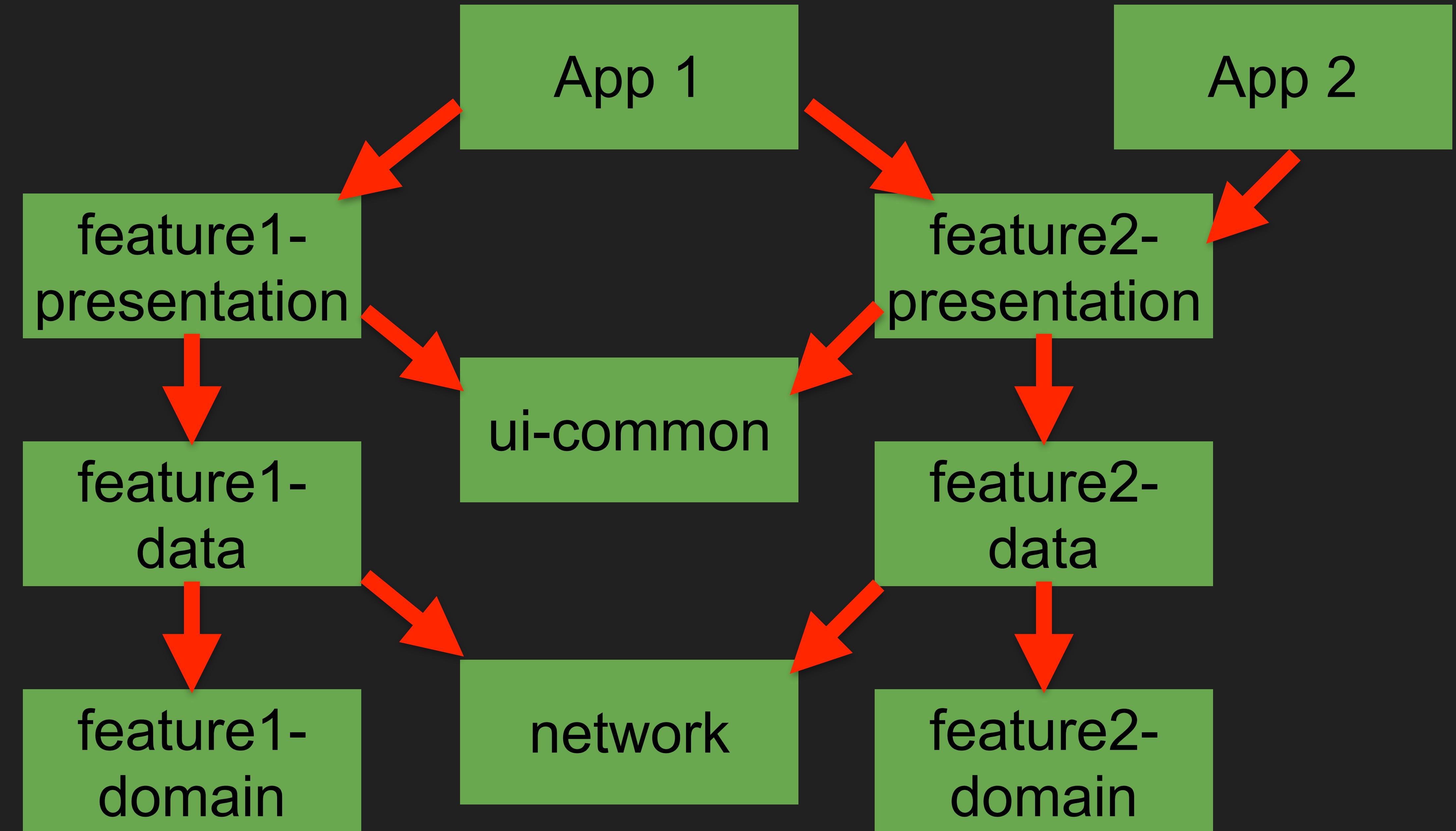
feature1-
data

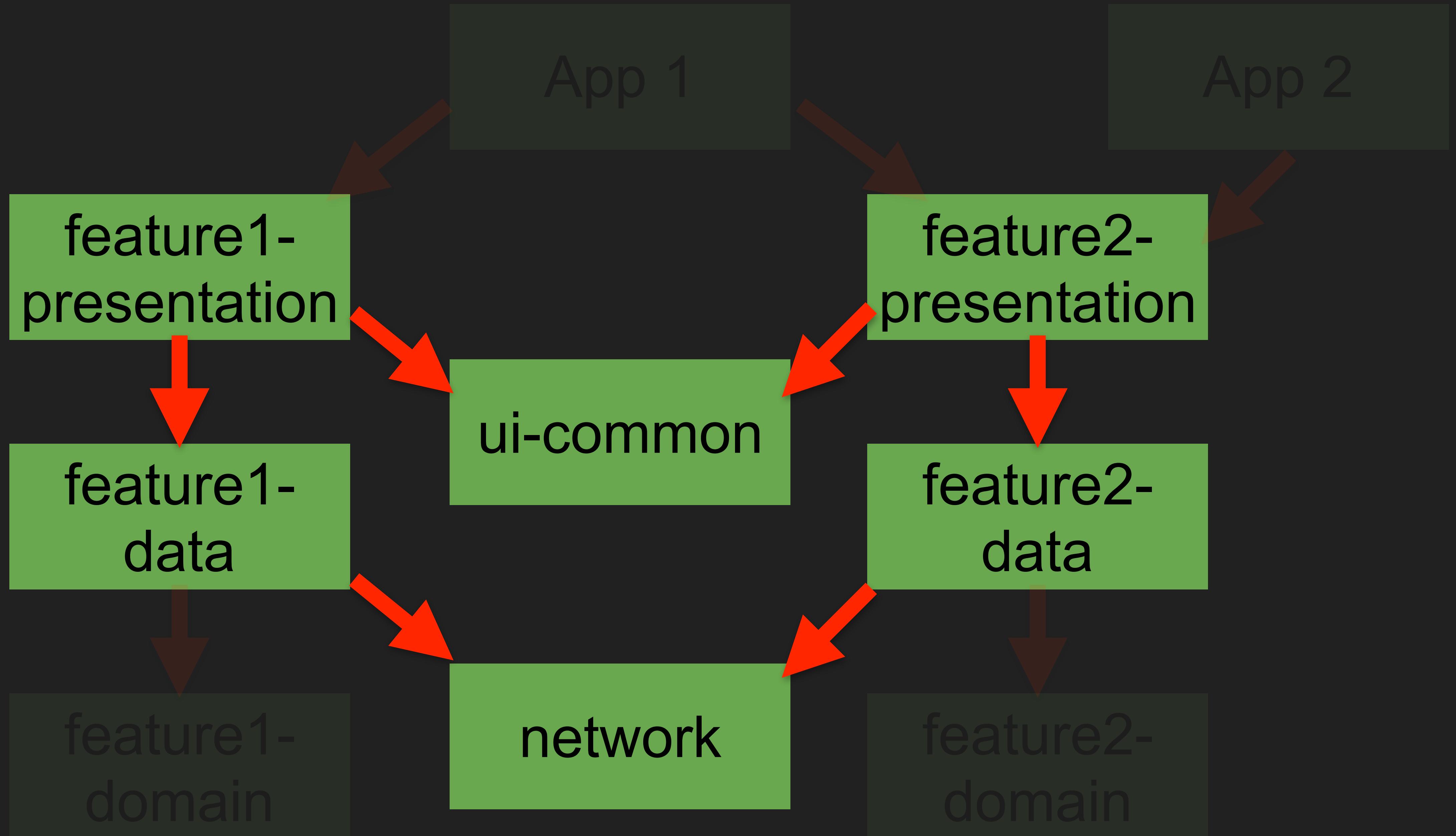
network

feature2-
data

./.../build.gradle

./shared-data.gradle
dependencies {
 ...
}





feature1-
presentation

feature1-
data

ui-common

network

feature2-
presentation

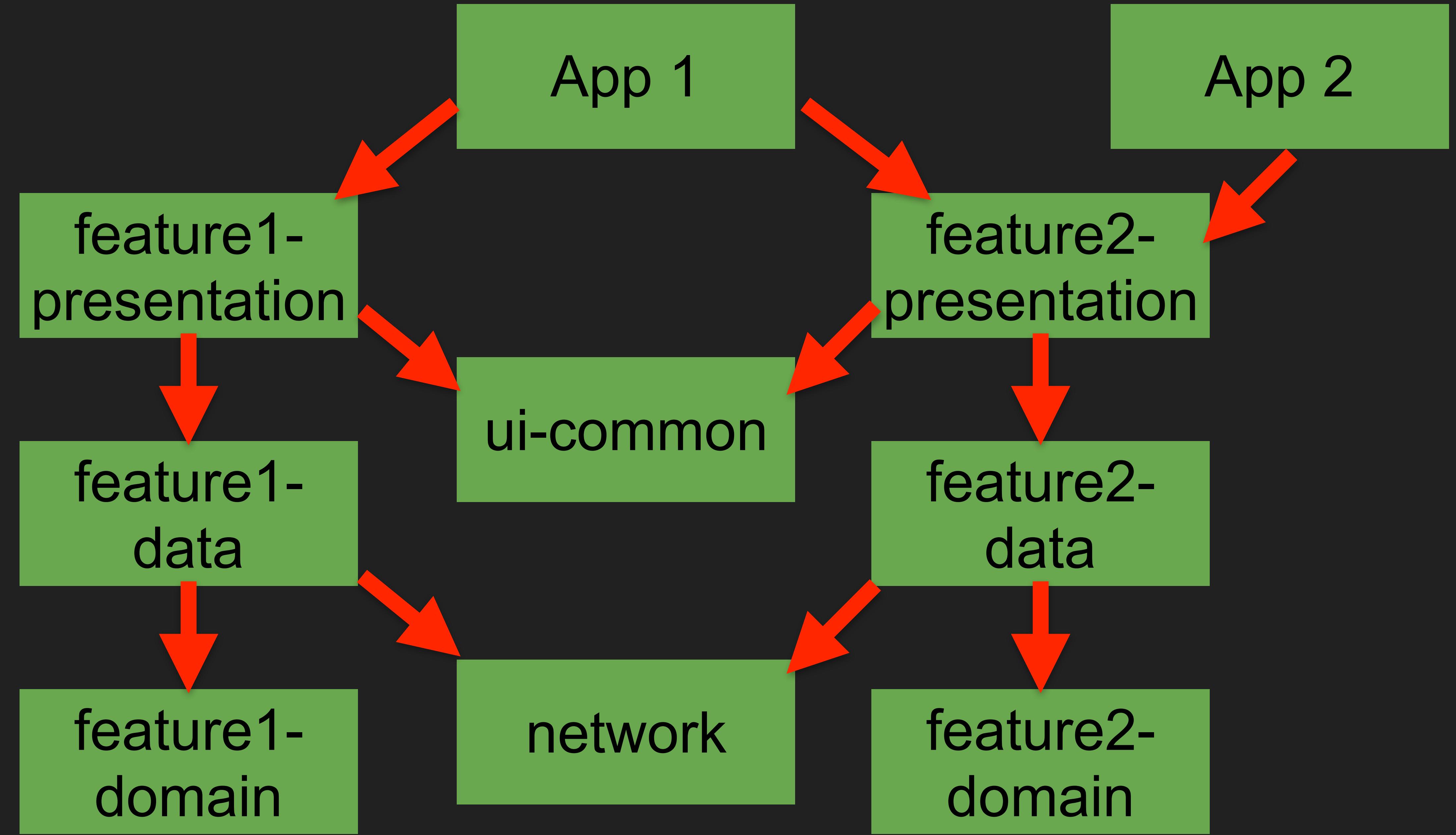
feature2-
data

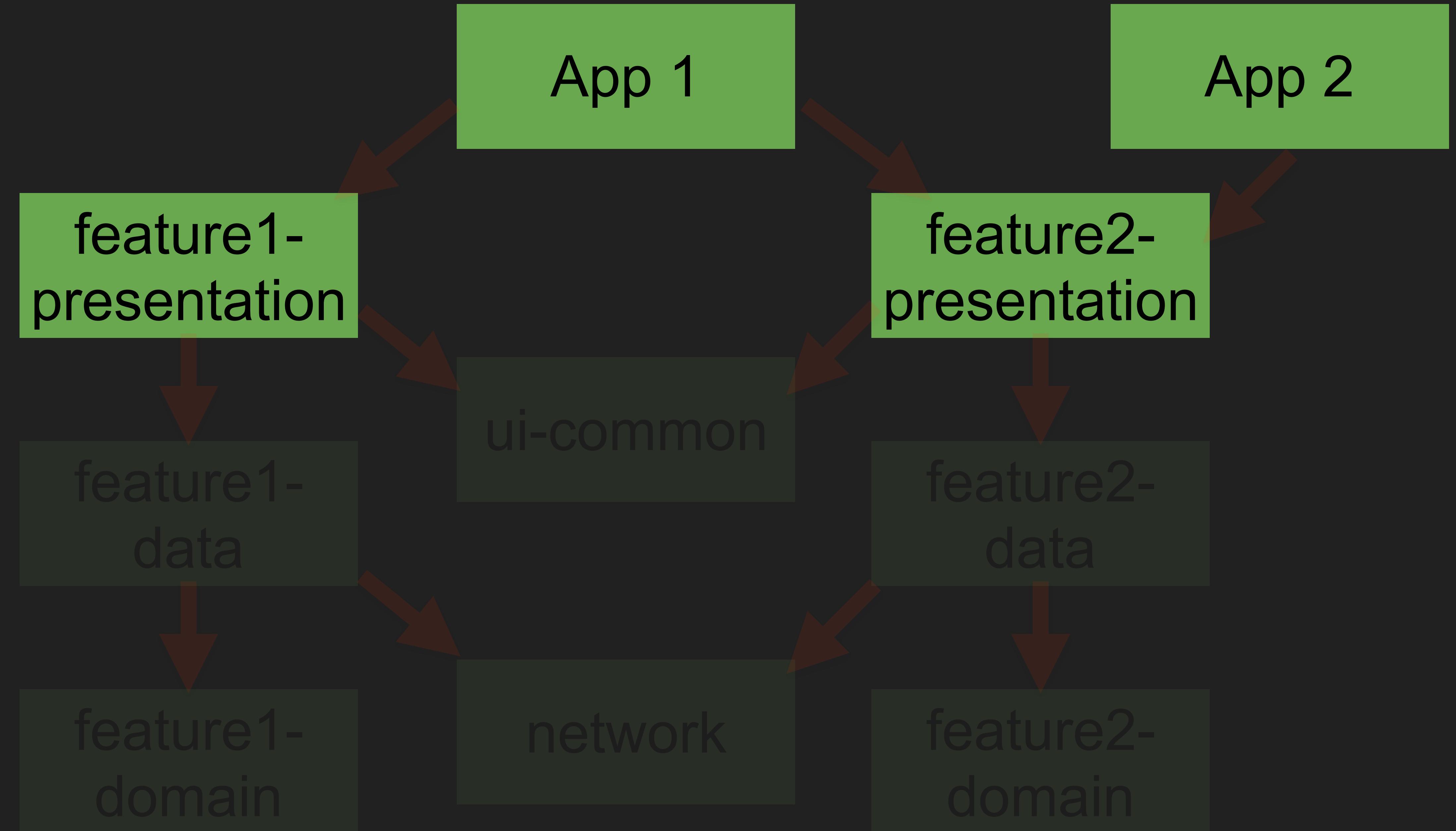
```
./shared-android.gradle
```

```
android {
```

```
...
```

```
}
```





feature1-
presentation

App 1

feature2-
presentation

App 2

```
./shared-variants.gradle  
android {  
    flavorDimensions "function"  
    productFlavors { ... }  
}
```

feature1-
presentation

App 1

feature2-
presentation

App 2

```
./shared-variants.gradle  
android { ... }  
configurations { ... }
```

feature1-
presentation

App 1

feature2-
presentation

App 2

```
./shared-variants.gradle  
android { ... }  
configurations { ... }
```

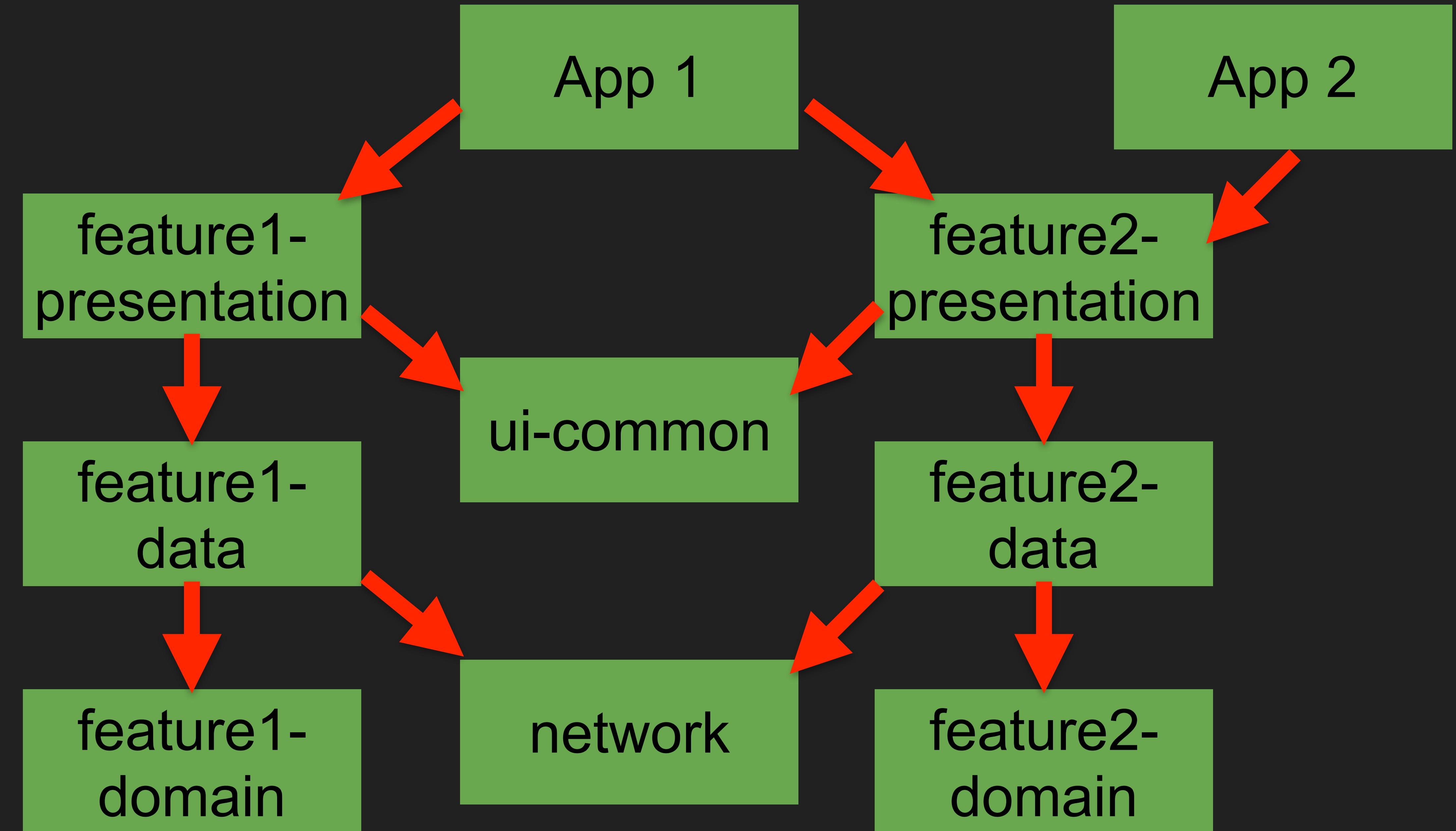
feature1-
presentation

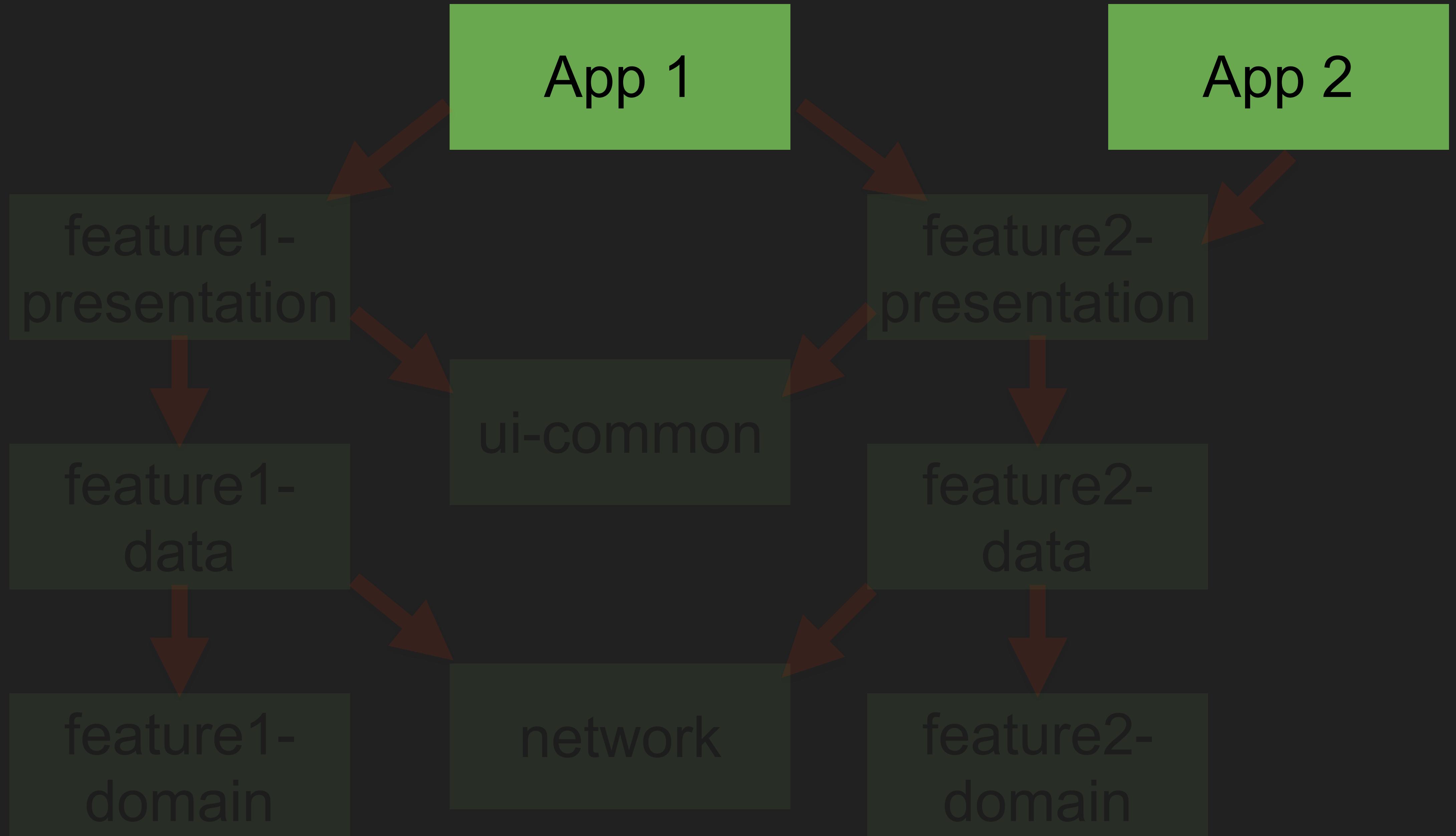
App 1

feature2-
presentation

App 2

```
./shared-variants.gradle  
android { ... }  
configurations { ... }  
android.variantFilter { ... }
```

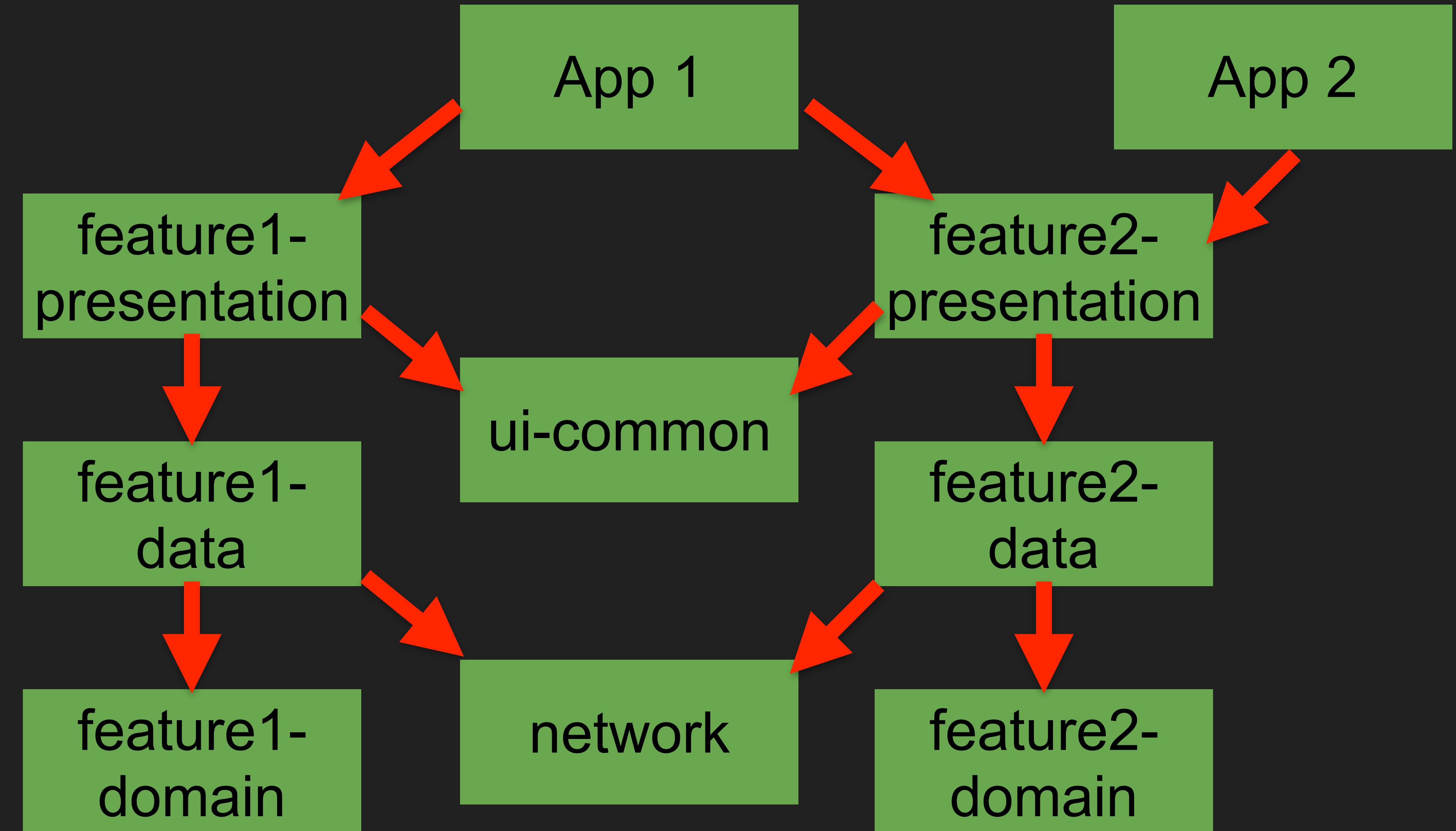


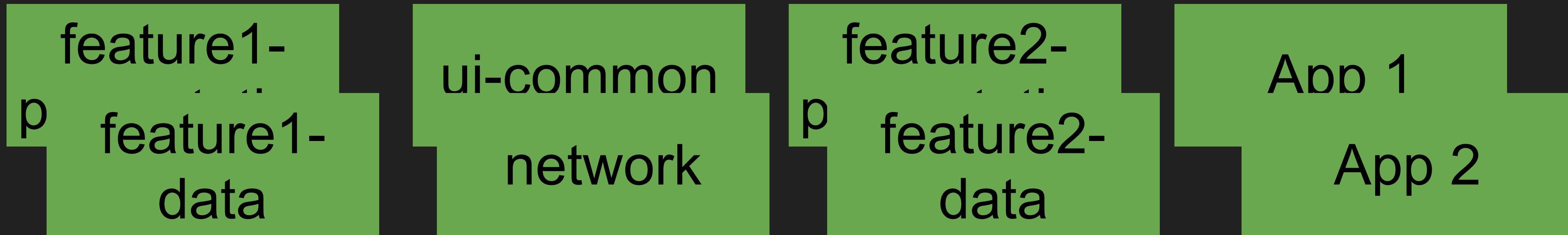


App 1

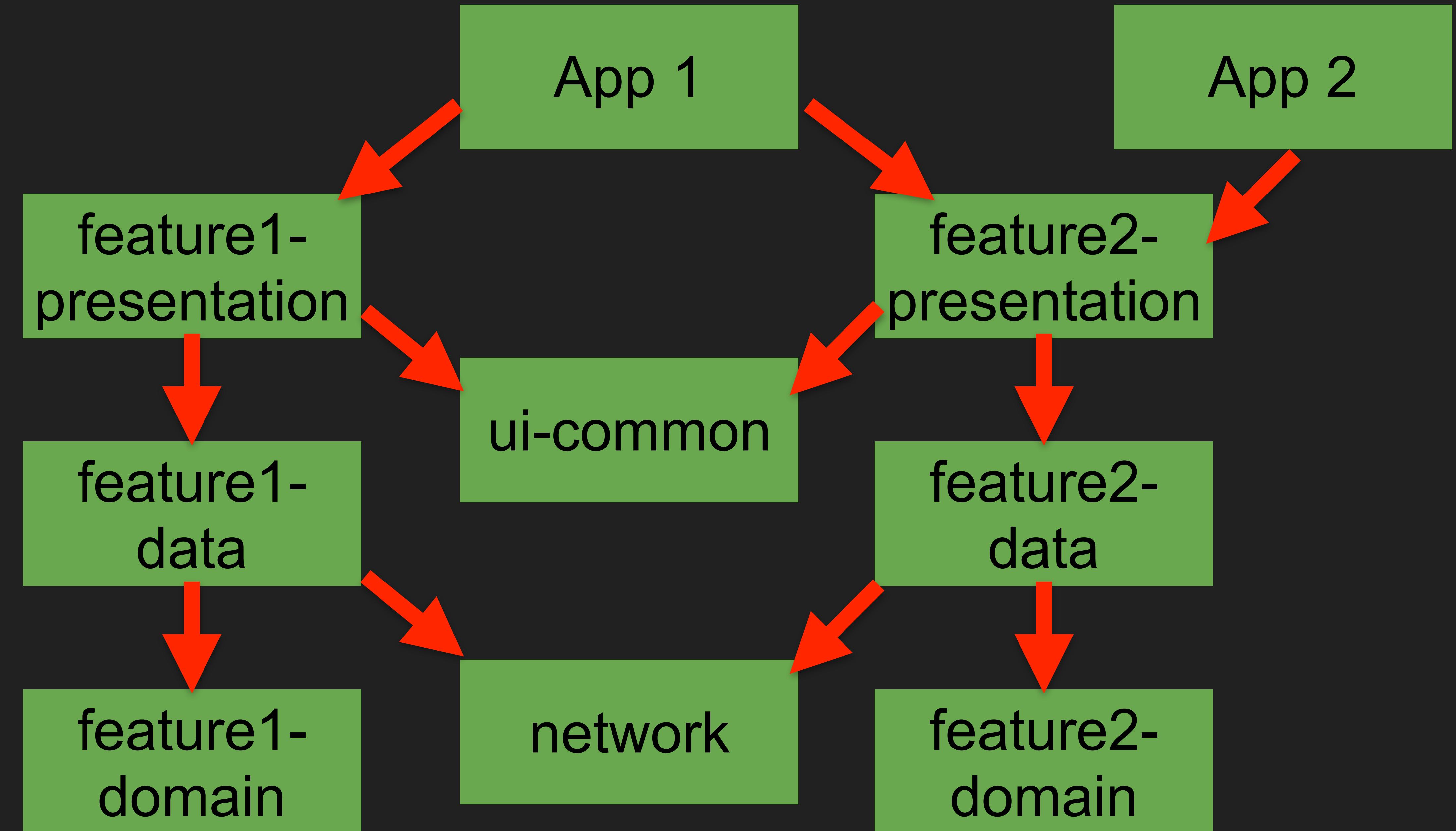
App 2

```
./shared-apps.gradle
android {
    buildTypes {
        proguardFiles ...
        testProguardFile ...
    }
}
packagingOptions { ... }
```





```
./shared-test.gradle
android {
    sourceSets {
        test.java.srcDirs += [
            "..."]
    }
}
```



feature1-
presentation

feature1-
data

feature1-
domain

```
./shared-feature1-tasks.gradle
task cleanReports(
    type: Delete, group: 'Reports') {
    description "Delete Reports"
    delete 'reportsDirectory'
}
```


Get Organized!

VINYL GOLDEN PARK

Get Organized!

```
./shard-apps.gradle
```

```
./shard-android.g
```

```
./shard-data.gradle
```

```
./shard-domain.gra
```

```
./shard-variants.gradle
```

Get Organized!

```
./buildscripts/
```

```
  ./shard-apps.gradle
```

```
  ./shard-android.gradle
```

```
  ./shard-domain.gradle
```

Get Organized!

```
./settings.gradle
```

```
include ':buildscripts', ...
```

```
./buildscripts/
```

```
  ./shard-apps.gradle
```

Renaming



© 2005 S.F.I.
SUPER PERMANENT INK
• Specialty formulated ink for educational
institutions and commercial users

© Sharpie, 1999
Made in USA

Enter file name:

Include non-project files (⇧⌘O)

*.gradle

● build.gradle (multimodulegradle)

multimodulegradle

● build.gradle (app)

app

● build.gradle (core)

core

● build.gradle (data)

data

● build.gradle (utils)

utils

● settings.gradle (multimodulegradle)

multimodulegradle

● versions.gradle (multimodulegradle/buildscripts)

multimodulegradle

Press ⌘↑ or ⌘↓ to navigate through the history

\ or /

Enter file name: Include non-project files (↑⌘O)  

 d/gradle 

 build.gradle (data) data 

 build.gradle (domain) domain 

Press ⌘↑ or ⌘↓ to navigate through the history

```
./app/build.gradle
```

```
./app/app.gradle
```

```
./app/app.gradle
```

```
./lib/lib.gradle
```

```
./app/app.gradle
```

```
./lib/lib.gradle
```

```
./data/data.gradle
```

```
./lib/lib.gradle
```

```
./data/data.gradle
```

```
./core/core.gradle
```

./data/data.gradle

./core/core.gradle

./util/util.gradle

```
./settings.gradle

rootProject.children.each {
    subproject ->
        subproject.buildFileName =
            "${subproject.name}.gradle"
}
```

Enter file name:



Include non-project files (⇧⌘O)

🔍 *.gradle



🕒 app.gradle (app)

app

🕒 build.gradle (multimodulegradle)

multimodulegradle

🕒 core.gradle (core)

core

🕒 data.gradle (data)

data

🕒 settings.gradle (multimodulegradle)

multimodulegradle

🕒 utils.gradle (utils)

utils

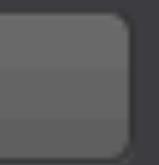
🕒 versions.gradle (multimodulegradle/buildscripts)

multimodulegradle

🕒 build.gradle.kts (buildSrc)

buildSrc

Enter file name:



Include non-project files (⇧⌘O)



s.gra



④ settings.gradle (multimodulegradle)

multimodulegradle

④ utils.gradle (utils)

utils

Press ⌘↑ or ⌘↓ to navigate through the history

Renaming

- bash script (github)

Renaming

- bash script (github)
- new modules

Pitfalls*

Pitfalls*

DON'T DO THIS

“core” module

“core” module

- For dependency management?

“core” module

```
./module1/module1.gradle
```

```
dependency {  
    implementation deps.dagger  
    implementation deps.timber  
    implementation deps.rxjava  
}
```

“core” module

```
./core/core.gradle
```

```
dependency {  
    api deps.dagger  
    api deps.timber  
    api deps.rxjava  
}
```

“core” module



```
./core/core.gradle
```



STOP

“core” module

- For dependency management?
- Don't enlarge the surface!

“core” module

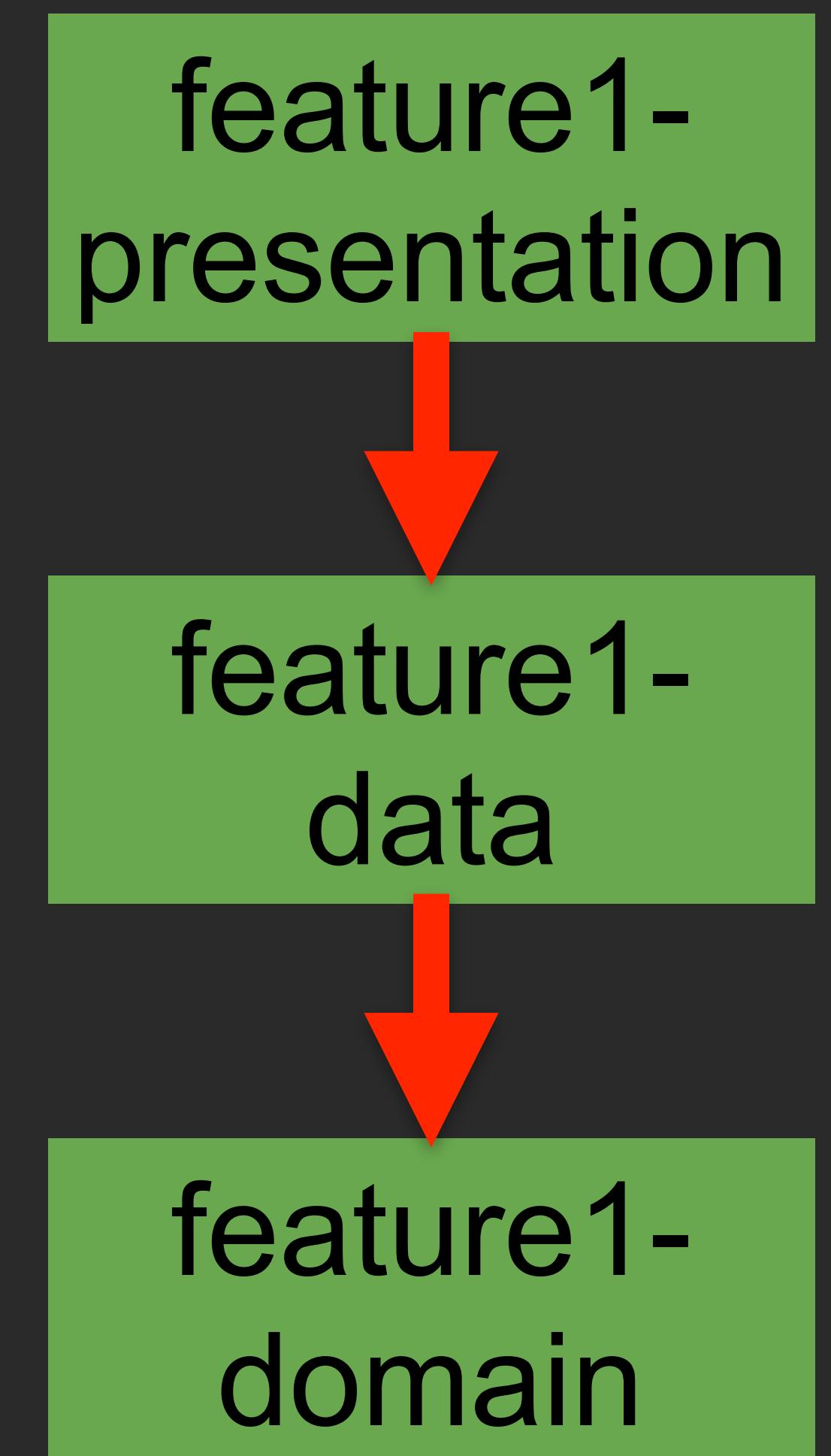
- For dependency management?
- Don't enlarge the surface!
- Slower builds

“core” module

- For dependency management?
- Don't enlarge the surface!
- Slower builds
- Shared gradle file instead

Nested Modules

Nested Modules



Nested Modules

```
./feature1
  |-feature1-presentation
  |-feature1-data
  |-feature1-domain
```



SLOW

Nested Modules

- Slower reloading project

Nested Modules

- Slower reloading project
- Does not show up in Android view

Nested Modules

- Slower reloading project
- Does not show up in Android view
- Relative paths

If you insist...

1. Git History

```
> mkdir feature1  
> git mv feature1-domain ./feature1/  
feature1-domain  
  
...
```

2. Replace Relative Paths

```
apply from: "../buildscripts/shared-  
android.gradle"
```

2. Replace Relative Paths

```
apply from: "$BUILDSCRIPTS_DIR/shared-test.gradle"
```

3. Additional Settings

```
implementation  
    project(":feature1-data")
```

3. Additional Settings

implementation

```
project(":feature1:feature1-data")
```

3. Additional Settings

```
implementation  
project(":feature1-data")
```

```
./settings.gradle  
include ':feature1-data'  
  
project(':feature1-data').projectDir =  
new File('../feature1/feature1-data')
```

Resources

<https://google.github.io/android-gradle-dsl/current/>

<https://docs.gradle.org/current/dsl/index.html>

<https://gradle.org/releases/>

<https://gradle.org/guides/>

<http://www.developerphil.com/>

<https://developer.android.com/studio/build/optimize-your-build.html>

<https://github.com/cliveleehere/multimodulegradle>

Google I/O 2017 “What's New in Android Development Tools”



Thanks!

@CliveLeeHere

