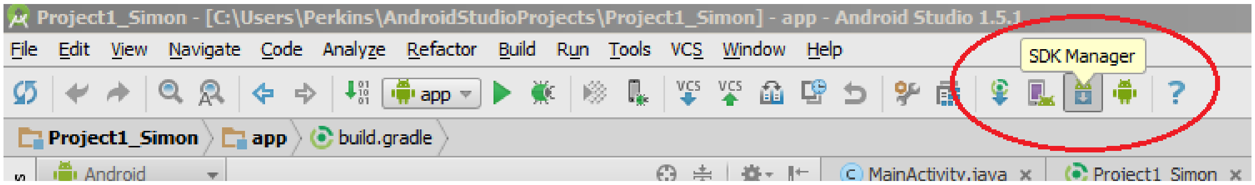
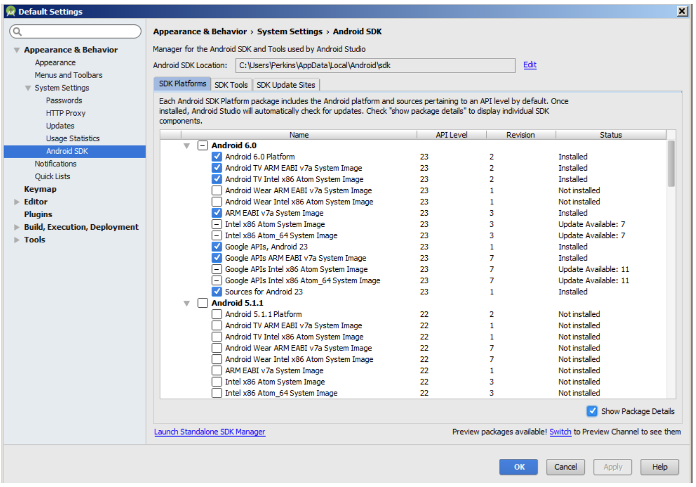
Install and Configure Development Environment

Install latest Android Studio and SDK http://developer.android.com/sdk/index.html
(Based on IntelliJ so if you use that or Pycharm you are in good shape)


Project1_Simon - [C:\Users\Perkins\AndroidStudioProjects\Project1_Simon] - app - Android Studio 1.5.1
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
SDK Manager
app
Project1_Simon
app
build.gradle
Android
MainActivity.java
Project1_Simon

Go to SDK manager

- ○ Note the number of versions of Android, 1 for every major release and each device is running one of these versions
- ○ tools and extras, at least your phone version. You target particular versions of Android for your apps, make it as wide as possible to make it appeal to as many users using as many different versions as possible. But keep in mind that each new release added new features, if you make it backwardly compatible to far (1 for instance) then you cannot use apis that were introduced in 3. Here I am using 6



Appearance & Behavior › System Settings › Android SDK

Manager for the Android SDK and Tools used by Android Studio

Android SDK Location: C:\Users\Perkins\AppData\Local\Android\sdk Edit

SDK Platforms | SDK Tools | SDK Update Sites

Each Android SDK Platform package includes the Android platform and sources pertaining to an API level by default. Once installed, Android Studio will automatically check for updates. Check "show package details" to display individual SDK components.

Name	API Level	Revision	Status
⊟ **Android 6.0**			
☑ Android 6.0 Platform	23	2	Installed
☑ Android TV ARM EABI v7a System Image	23	2	Installed
☑ Android TV Intel x86 Atom System Image	23	2	Installed
□ Android Wear ARM EABI v7a System Image	23	1	Not installed
□ Android Wear Intel x86 Atom System Image	23	1	Not installed
☑ ARM EABI v7a System Image	23	3	Installed
⊟ Intel x86 Atom System Image	23	3	Update Available: 7
⊟ Intel x86 Atom_64 System Image	23	3	Update Available: 7
☑ Google APIs, Android 23	23	1	Installed
☑ Google APIs ARM EABI v7a System Image	23	7	Installed
⊟ Google APIs Intel x86 Atom System Image	23	7	Update Available: 11
⊟ Google APIs Intel x86 Atom_64 System Image	23	7	Update Available: 11
☑ Sources for Android 23	23	1	Installed
□ **Android 5.1.1**			
□ Android 5.1.1 Platform	22	2	Not installed
□ Android TV ARM EABI v7a System Image	22	1	Not installed
□ Android TV Intel x86 Atom System Image	22	1	Not installed
□ Android Wear ARM EABI v7a System Image	22	7	Not installed
□ Android Wear Intel x86 Atom System Image	22	7	Not installed
□ ARM EABI v7a System Image	22	1	Not installed
□ Intel x86 Atom System Image	22	3	Not installed
□ Intel x86 Atom_64 System Image	22	3	Not installed

☑ Show Package Details

Launch Standalone SDK Manager

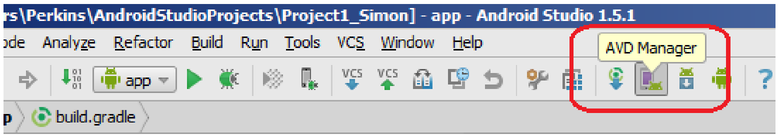
Preview packages available! Switch to Preview Channel to see them

OK Cancel Apply Help

-

go to SDK tools and show off build tools and
the critical Google USB Driver needed for Google devices(Windows only)

Go to AvdManager


rs\Perkins\AndroidStudioProjects\Project1_Simon] - app - Android Studio 1.5.1
ode Analyze Refactor Build Run Tools VCS Window Help
AVD Manager
app
p
build.gradle

AVD manager – manage virtual devices to test your app on can have as many as you want different sizes and APIs. Used to be slow, very fast now.

Can debug on Emulator or physical device. Emulator is much faster but is simulated and may be missing hardware (gps, accelerometer etc..) AS has a process called adb (Android Debug Bridge) which communicates with emulated and physical devices.

Connect Physical device

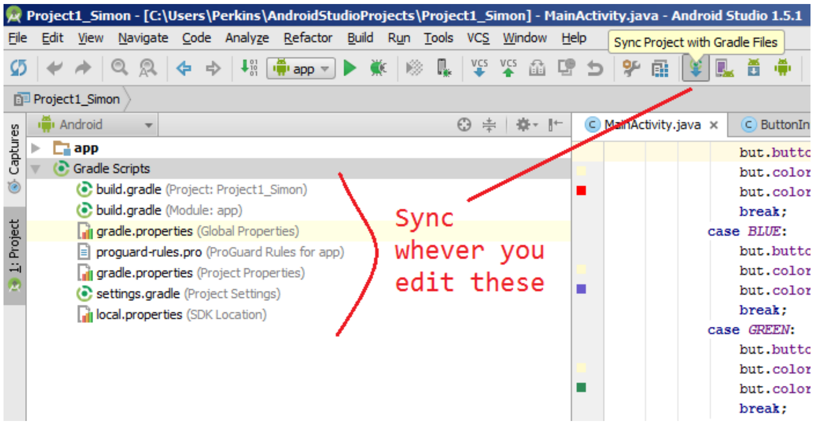
Enable developer mode on device (Google Pixel –Toggle on "USB Debugging" in the "Developer Options" area of Settings.). If you do not see "Developer Options", go into "About device" in Settings and tap on the "Build number" entry seven times, which will unlock "Developer Options".

configure and use USB device driver for windows if necessary (via Windows device manager)

Enable Debugging

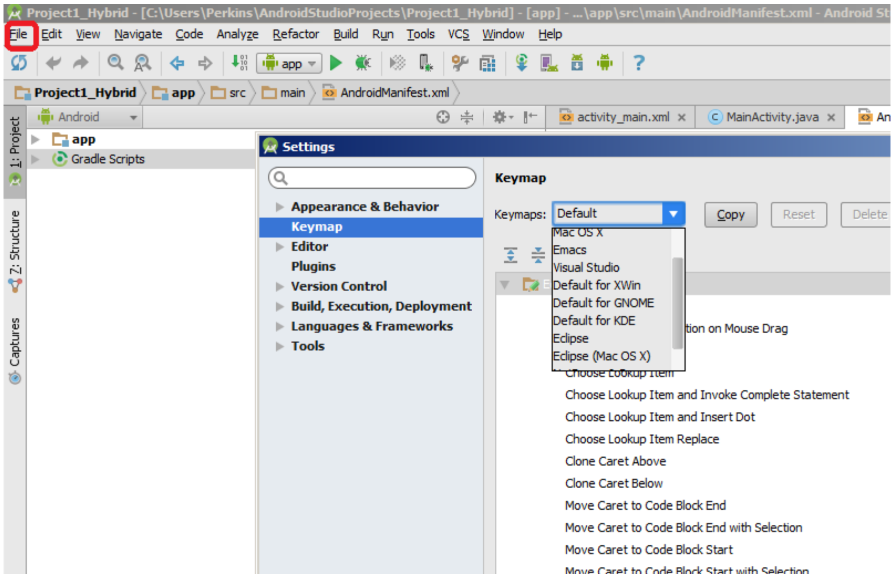
Demo on Device
Go to Debug Options
Stay Awake (otherwise you have to constantly unlock your app when debugging)
Usb Debugging

Whenever you change a system file resync your gradle files. It will rebuild your project (possibly painfully slow)


Project1_Simon - [C:\Users\Perkins\AndroidStudioProjects\Project1_Simon] - MainActivity.java - Android Studio 1.5.1
File
Edit
View
Navigate
Code
Analyze
Refactor
Build
Run
Tools
VCS
Window
Help
Sync Project with Gradle Files
app
Project1_Simon
Captures
1: Project
Android
app
Gradle Scripts
build.gradle (Project: Project1_Simon)
build.gradle (Module: app)
gradle.properties (Global Properties)
proguard-rules.pro (ProGuard Rules for app)
gradle.properties (Project Properties)
settings.gradle (Project Settings)
local.properties (SDK Location)
MainActivity.java
ButtonIn
Sync
whever you
edit these

```
        but.buttc
        but.color
        but.color
        break;
    case BLUE:
        but.buttc
        but.color
        but.color
        break;
    case GREEN:
        but.buttc
        but.color
        but.color
        break;
```

Keyboard shortcuts (productivity boost) can use defaults or configure how you like

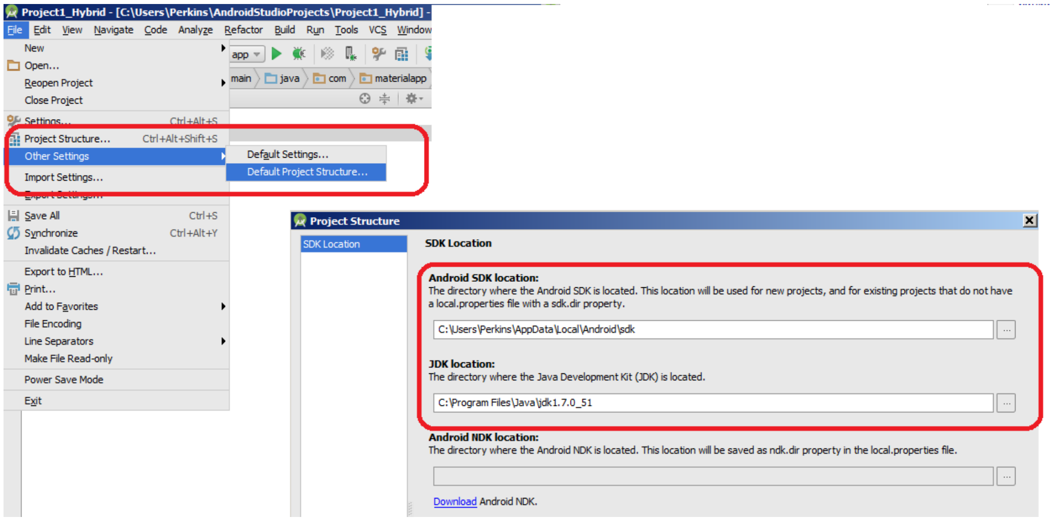


Keymap

Keymaps: Default

I like AS defaults, here are the ones I use a lot they are in a word file on scholar (Hotkeys I use). Here they are in a note I keep floating nearby

And where is the AS SDK and JDK? AS installs its own JRE.



SDK Location

Android SDK location:
The directory where the Android SDK is located. This location will be used for new projects, and for existing projects that do not have a local.properties file with a sdk.dir property.

C:\Users\Perkins\AppData\Local\Android\sdk

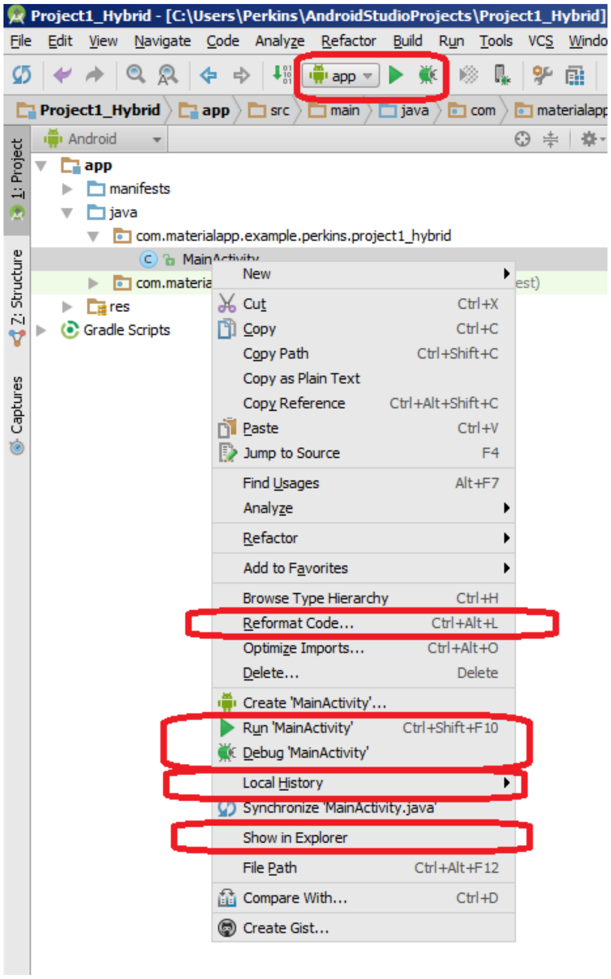
JDK location:
The directory where the Java Development Kit (JDK) is located.

C:\Program Files\Java\jdk1.7.0_51

Android NDK location:
The directory where the Android NDK is located. This location will be saved as ndk.dir property in the local.properties file.

Download Android NDK.

Useful File Stuff


Project1_Hybrid - [C:\Users\Perkins\AndroidStudioProjects\Project1_Hybrid]
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Windo
app
Project1_Hybrid app src main java com materialapp
1: Project
7: Structure
Captures
Android
app
manifests
java
com.materialapp.example.perkins.project1_hybrid
MainActivity
com.materia
est)
res
Gradle Scripts
New
Cut Ctrl+X
Copy Ctrl+C
Copy Path Ctrl+Shift+C
Copy as Plain Text
Copy Reference Ctrl+Alt+Shift+C
Paste Ctrl+V
Jump to Source F4
Find Usages Alt+F7
Analyze
Refactor
Add to Favorites
Browse Type Hierarchy Ctrl+H
Reformat Code... Ctrl+Alt+L
Optimize Imports... Ctrl+Alt+O
Delete... Delete
Create 'MainActivity'...
Run 'MainActivity' Ctrl+Shift+F10
Debug 'MainActivity'
Local History
Synchronize 'MainActivity.java'
Show in Explorer
File Path Ctrl+Alt+F12
Compare With... Ctrl+D
Create Gist...

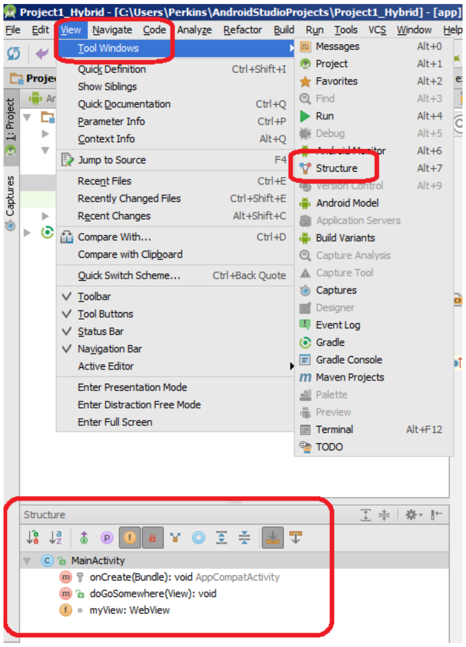
Manifest and Resources (much more later)

Manifest defines your app, what **permissions** it needs (read by google play and used to ask you “do you want to allow this app to…” and what the startup UI is, what other components are defined and used.

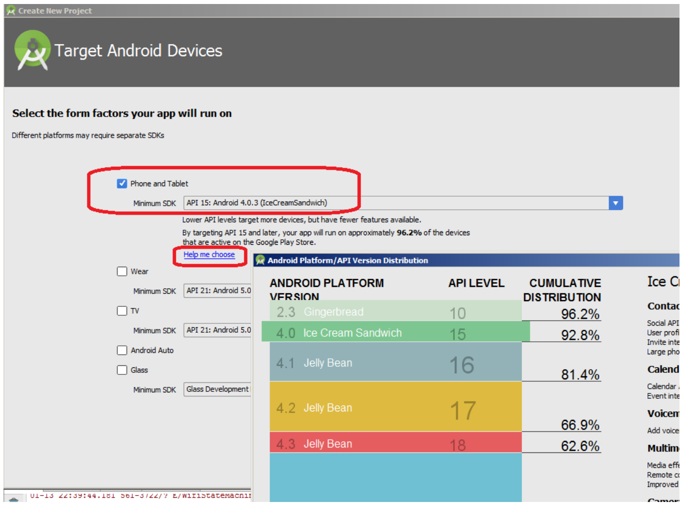
Res folder

Holds xml layout files (they describe UI)
Strings you will use, colors, drawables, themes

Use Structures view to see object hierarchy


Project1_Hybrid - [C:\Users\Perkins\AndroidStudioProjects\Project1_Hybrid] - [app]
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
Tool Windows
Quick Definition Ctrl+Shift+I
Show Siblings
Quick Documentation Ctrl+Q
Parameter Info Ctrl+P
Context Info Alt+Q
Jump to Source F4
Recent Files Ctrl+E
Recently Changed Files Ctrl+Shift+E
Recent Changes Alt+Shift+C
Compare With... Ctrl+D
Compare with Clipboard
Quick Switch Scheme... Ctrl+Back Quote
Toolbar
Tool Buttons
Status Bar
Navigation Bar
Active Editor
Enter Presentation Mode
Enter Distraction Free Mode
Enter Full Screen
Messages Alt+0
Project Alt+1
Favorites Alt+2
Find Alt+3
Run Alt+4
Debug Alt+5
Android Monitor Alt+6
Structure Alt+7
Version Control Alt+9
Android Model
Application Servers
Build Variants
Capture Analysis
Capture Tool
Captures
Designer
Event Log
Gradle
Gradle Console
Maven Projects
Palette
Preview
Terminal Alt+F12
TODO
Project
1: Project
Captures
Structure
MainActivity
onCreate(Bundle): void AppCompatActivity
doGoSomewhere(View): void
myView: WebView

Development
New Project
Package
Minimum sdk



Create New Project

Target Android Devices

Select the form factors your app will run on

Different platforms may require separate SDKs

☑ Phone and Tablet

Minimum SDK: API 15: Android 4.0.3 (IceCreamSandwich)

Lower API levels target more devices, but have fewer features available.

By targeting API 15 and later, your app will run on approximately **96.2%** of the devices that are active on the Google Play Store.

Help me choose

☐ Wear

Minimum SDK: API 21: Android 5.0

☐ TV

Minimum SDK: API 21: Android 5.0

☐ Android Auto

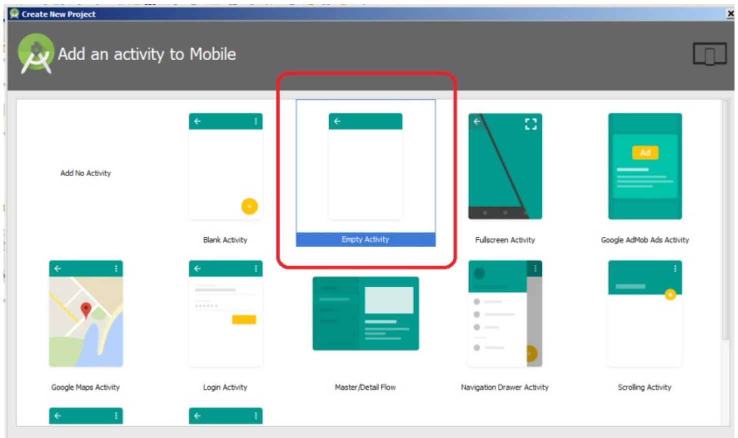
☐ Glass

Minimum SDK: Glass Development

Android Platform/API Version Distribution

ANDROID PLATFORM VERSION	API LEVEL	CUMULATIVE DISTRIBUTION
2.3 Gingerbread	10	96.2%
4.0 Ice Cream Sandwich	15	92.8%
4.1 Jelly Bean	16	81.4%
4.2 Jelly Bean	17	66.9%
4.3 Jelly Bean	18	62.6%

```
01-13 22:39:44.181 561-3722/? E/WifiStateMachi
```



Create New Project

Add an activity to Mobile

<u>Show</u>
Build, Run
Debug
Show

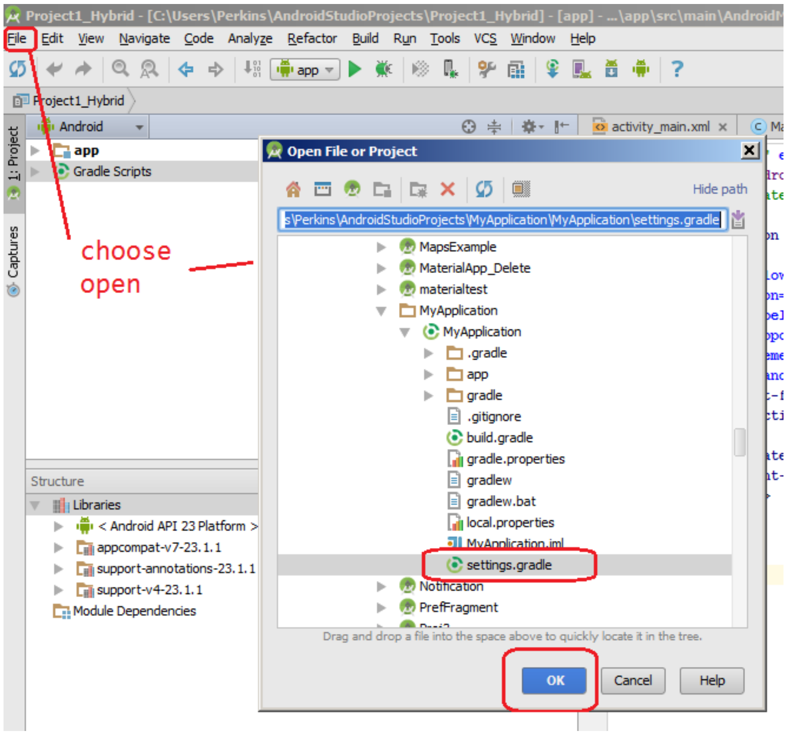
logcat (alt-6 to restore)

Breakpoints (including conditional, right click on red breakpoint and add a boolean condition)

Show ctrl-j to make tag and log statement

show uninstall, reinstall
clean
close project

Find (show in folder)
Zip it
Delete orig project
Unzip
Import project (via settings.gradle)

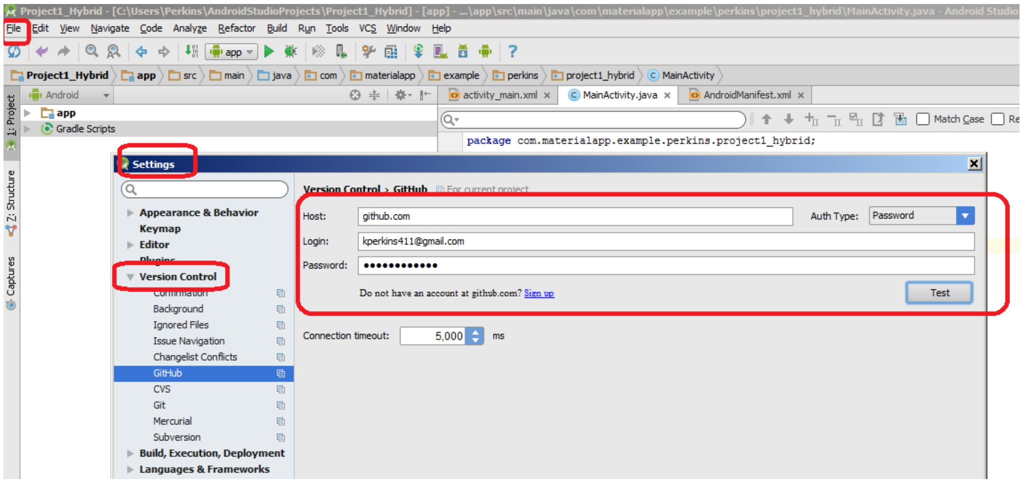


s\Perkins\AndroidStudioProjects\MyApplication\MyApplication\settings.gradle

Ready to go

Source Control- I use git and GitHub

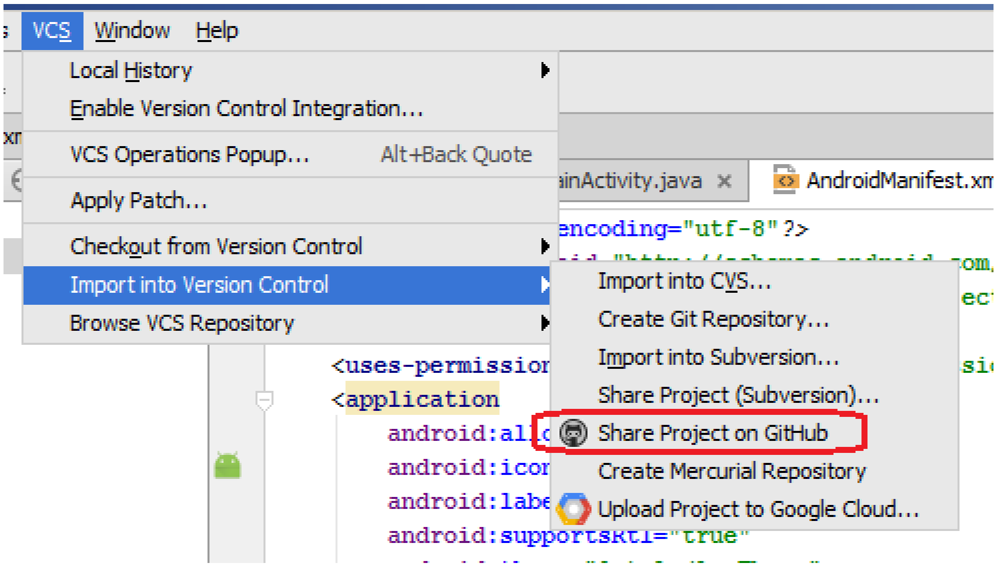
First set it up


Project1_Hybrid - [C:\Users\Perkins\AndroidStudioProjects\Project1_Hybrid] - [app] - ...\app\src\main\java\com\materialapp\example\perkins\project1_hybrid\MainActivity.java - Android Studio
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
Project1_Hybrid app src main java com materialapp example perkins project1_hybrid MainActivity
Android
app
Gradle Scripts
activity_main.xml
MainActivity.java
AndroidManifest.xml
Match Case
Settings
Appearance & Behavior
Keymap
Editor
Plugins
Version Control
Confirmation
Background
Ignored Files
Issue Navigation
Changelist Conflicts
GitHub
CVS
Git
Mercurial
Subversion
Build, Execution, Deployment
Languages & Frameworks
Version Control › GitHub
For current project
Do not have an account at github.com? Sign up
Test

```
package com.materialapp.example.perkins.project1_hybrid;
```

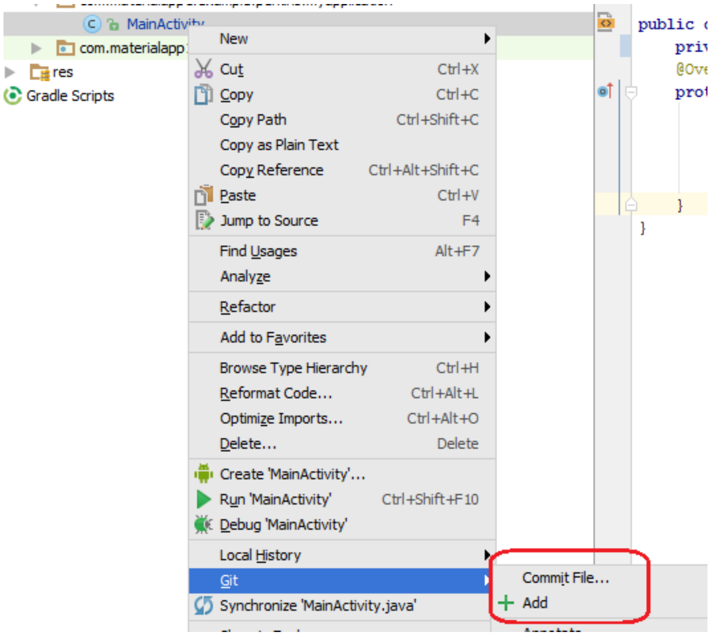
Host: github.com
Auth Type: Password
Login: kperkins411@gmail.com
Password: ••••••••••••
Connection timeout: 5,000 ms

Share on Github

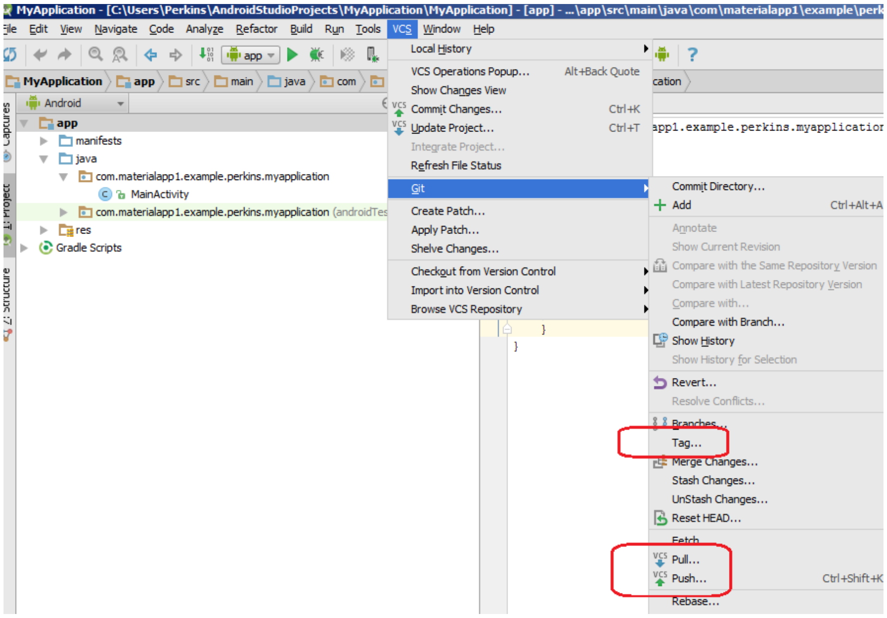


Will push it on up to github if your account is setup

Now change a file and it turns blue in the Project Window, so commit it locally.



To push up, or tag


MyApplication - [C:\Users\Perkins\AndroidStudioProjects\MyApplication\MyApplication] - [app] - ...\app\src\main\java\com\materialapp1\example\perk
File Edit View Navigate Code Analyze Refactor Build Run Tools VCS Window Help
MyApplication app src main java com
Android
app
manifests
java
com.materialapp1.example.perkins.myapplication
MainActivity
com.materialapp1.example.perkins.myapplication (androidTes
res
Gradle Scripts
Local History
VCS Operations Popup... Alt+Back Quote
Show Changes View
Commit Changes... Ctrl+K
Update Project... Ctrl+T
Integrate Project...
Refresh File Status
Git
Create Patch...
Apply Patch...
Shelve Changes...
Checkout from Version Control
Import into Version Control
Browse VCS Repository
Commit Directory...
Add Ctrl+Alt+A
Annotate
Show Current Revision
Compare with the Same Repository Version
Compare with Latest Repository Version
Compare with...
Compare with Branch...
Show History
Show History for Selection
Revert...
Resolve Conflicts...
Branches...
Tag...
Merge Changes...
Stash Changes...
UnStash Changes...
Reset HEAD...
Fetch
Pull...
Push... Ctrl+Shift+K
Rebase...

Tips:

If everything goes wonky kill AS (should kill adb.exe) and restart. If adb.exe remains running kill it and then restart AS.

If you cannot connect to device over usb cable suspect the cable! Try another, better yet try one that you have verified with another device