Java for FTC Workshop

Presented by FTC Team 8404 Quixilver
https://tinyurl.com/8404kickoff2019

About Our Team

- 6th year team
- Leland High School, Almaden
- 15 members from 8th - 12th grade
- Control Award at Champs 2019

Agenda

1. Introduction of FTC control system (10 min)
2. Project Set Up in Android Studio (10 min)
3. Simple OpMode (15 min)
4. Execution of programs (5 min)
5. Q/A Session (10 min)

The FTC Control System - Robot Controller

The FTC Control System - Driver Station

Choosing Phones

Considerations

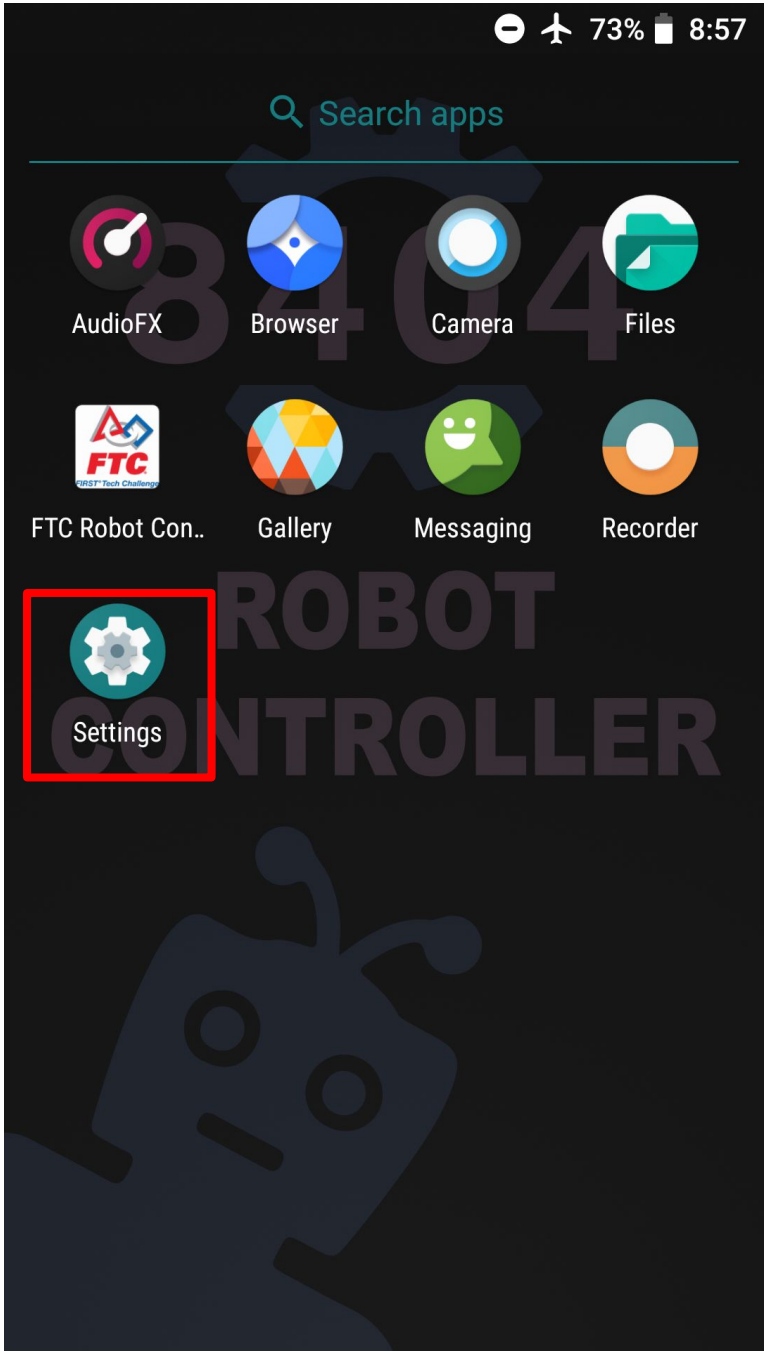
- Android 8.0 Oreo or higher
- 5ghz WiFi
- Fast Processor (for computer vision)

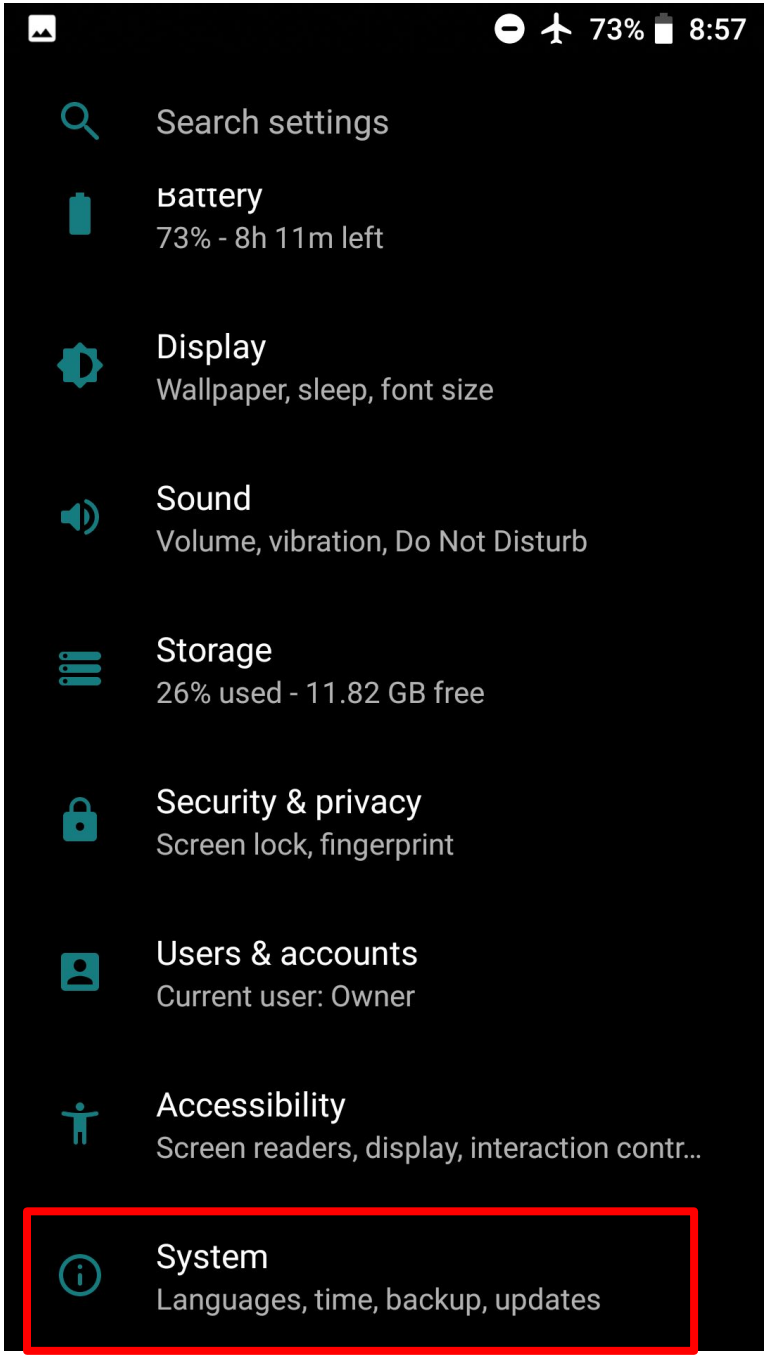
Our Picks

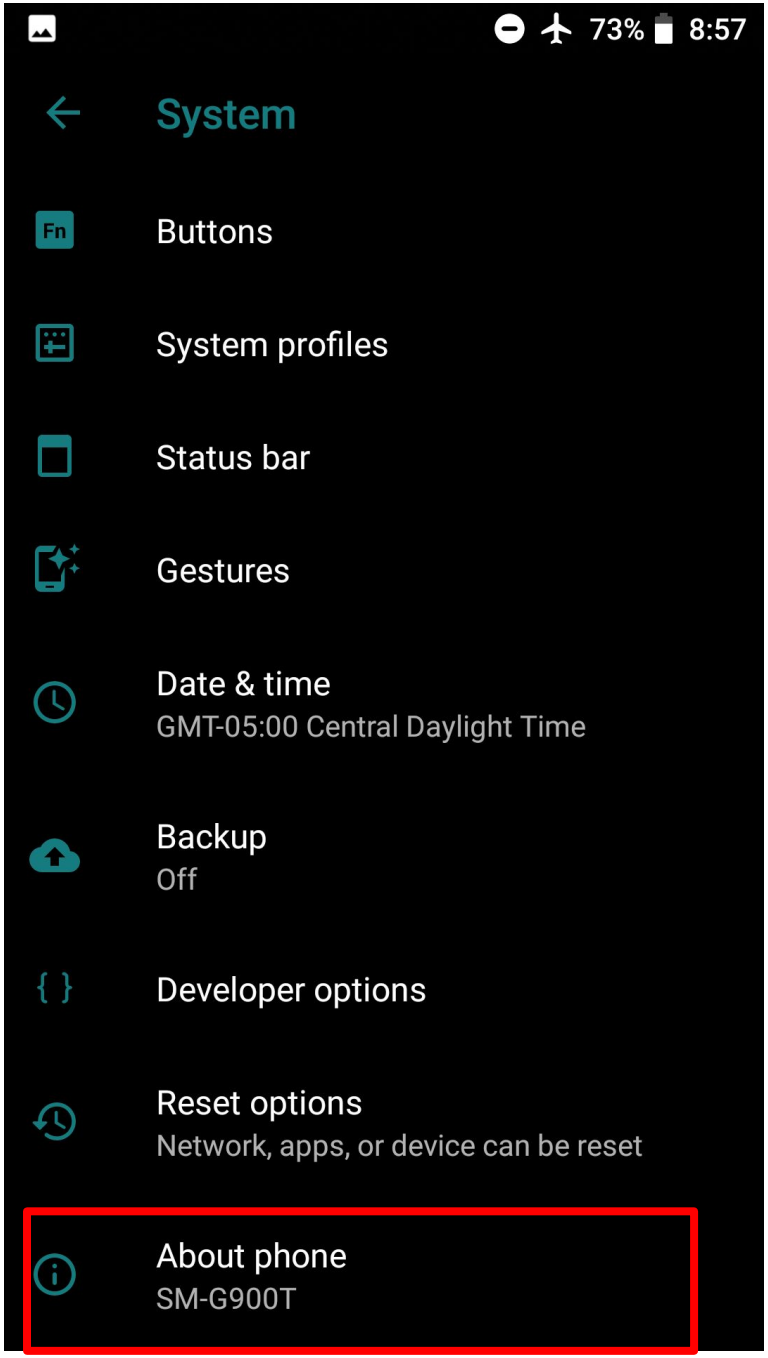
1. Samsung Galaxy S5 (running LineageOS ROM) for fastest speed
2. Motorola Moto E5 for an easier purchase

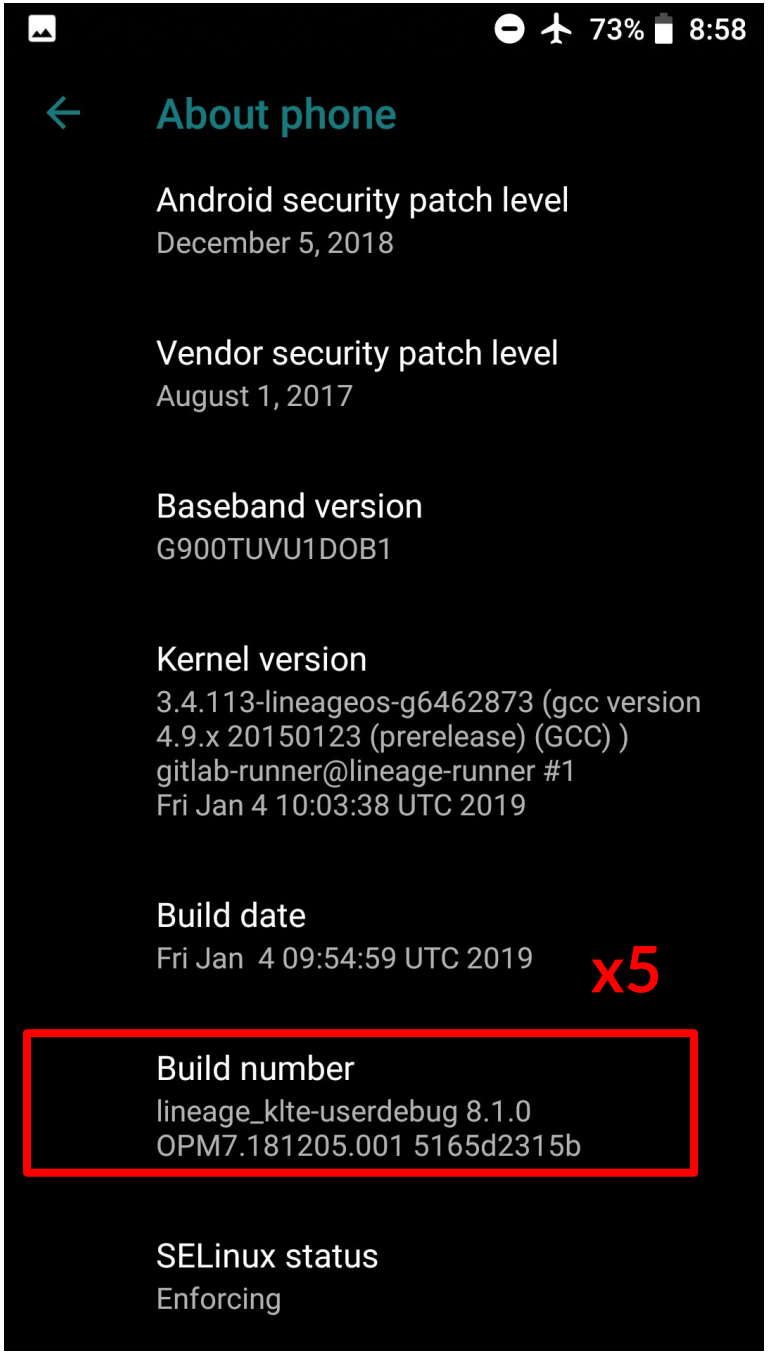
Set Up Phones

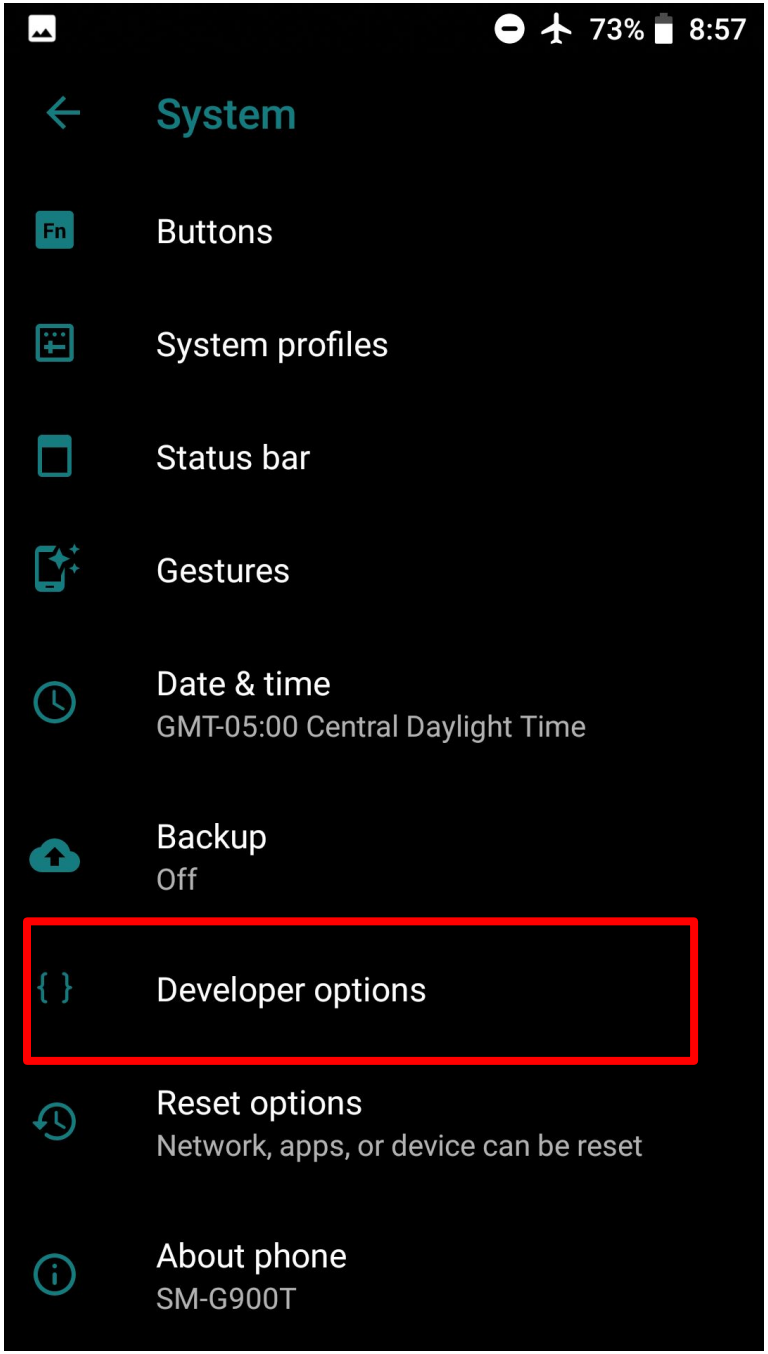
- Enable USB debugging
- Turn on airplane mode
- Connect WiFi direct


73% 8:57
Search apps
AudioFX
Browser
Camera
Files
FTC Robot Con..
Gallery
Messaging
Recorder
Settings
8404
ROBOT
CONTROLLER


73% 8:57
Search settings
Battery
73% - 8h 11m left
Display
Wallpaper, sleep, font size
Sound
Volume, vibration, Do Not Disturb
Storage
26% used - 11.82 GB free
Security & privacy
Screen lock, fingerprint
Users & accounts
Current user: Owner
Accessibility
Screen readers, display, interaction contr...
System
Languages, time, backup, updates


73% 8:57
System
Buttons
System profiles
Status bar
Gestures
Date & time
GMT-05:00 Central Daylight Time
Backup
Off
Developer options
Reset options
Network, apps, or device can be reset
About phone
SM-G900T


73% 8:58
About phone
Android security patch level
December 5, 2018
Vendor security patch level
August 1, 2017
Baseband version
G900TUVU1DOB1
Kernel version
3.4.113-lineageos-g6462873 (gcc version 4.9.x 20150123 (prerelease) (GCC))
gitlab-runner@lineage-runner #1
Fri Jan 4 10:03:38 UTC 2019
Build date
Fri Jan 4 09:54:59 UTC 2019
x5
Build number
lineage_klte-userdebug 8.1.0
OPM7.181205.001 5165d2315b
SELinux status
Enforcing


73% 8:57
System
Buttons
System profiles
Status bar
Gestures
Date & time
GMT-05:00 Central Daylight Time
Backup
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Developer options
Reset options
Network, apps, or device can be reset
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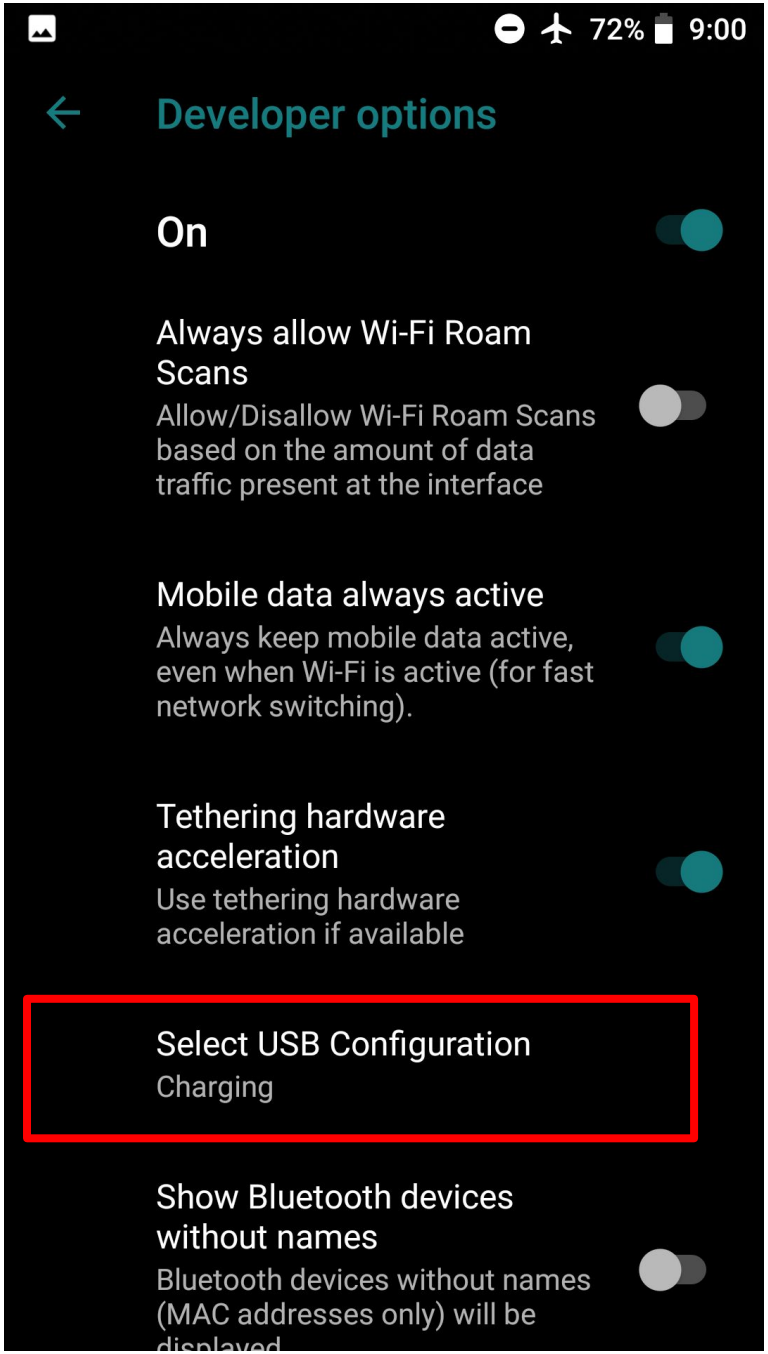
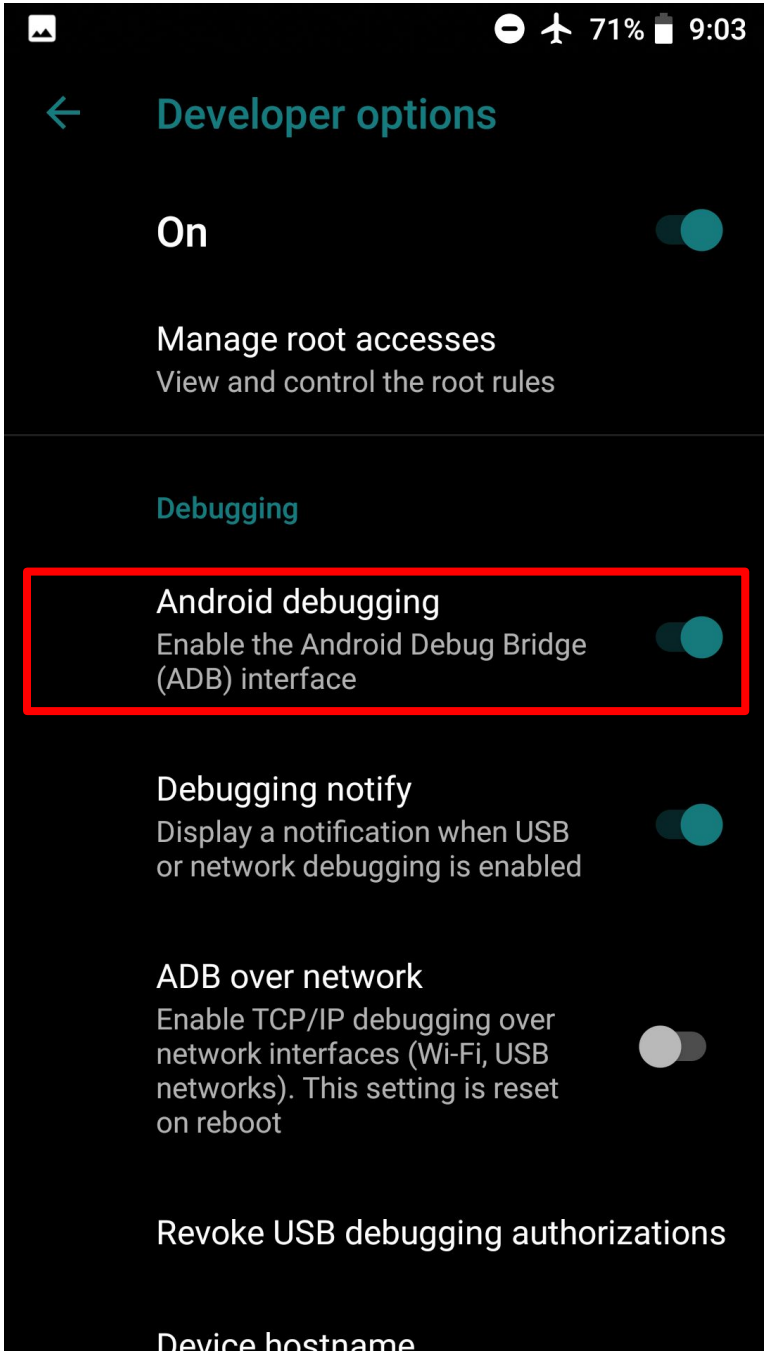
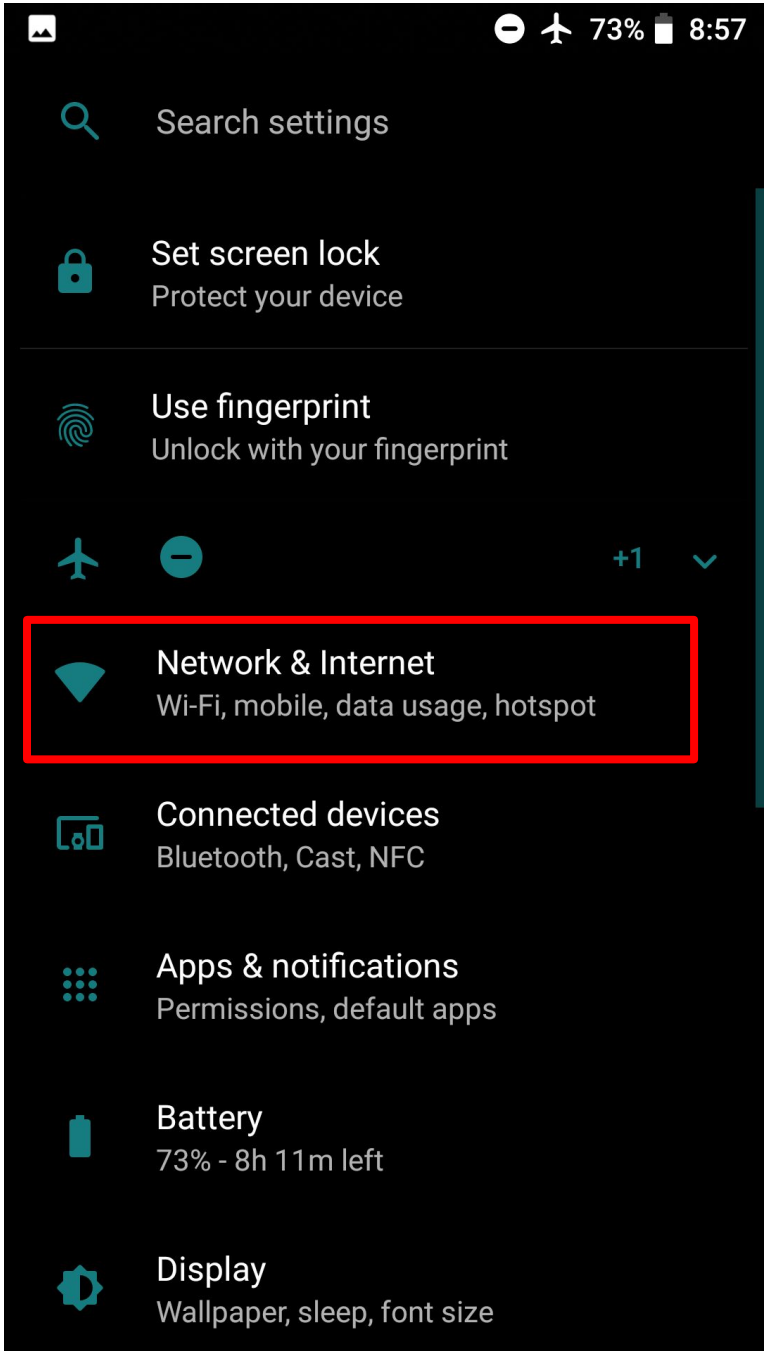
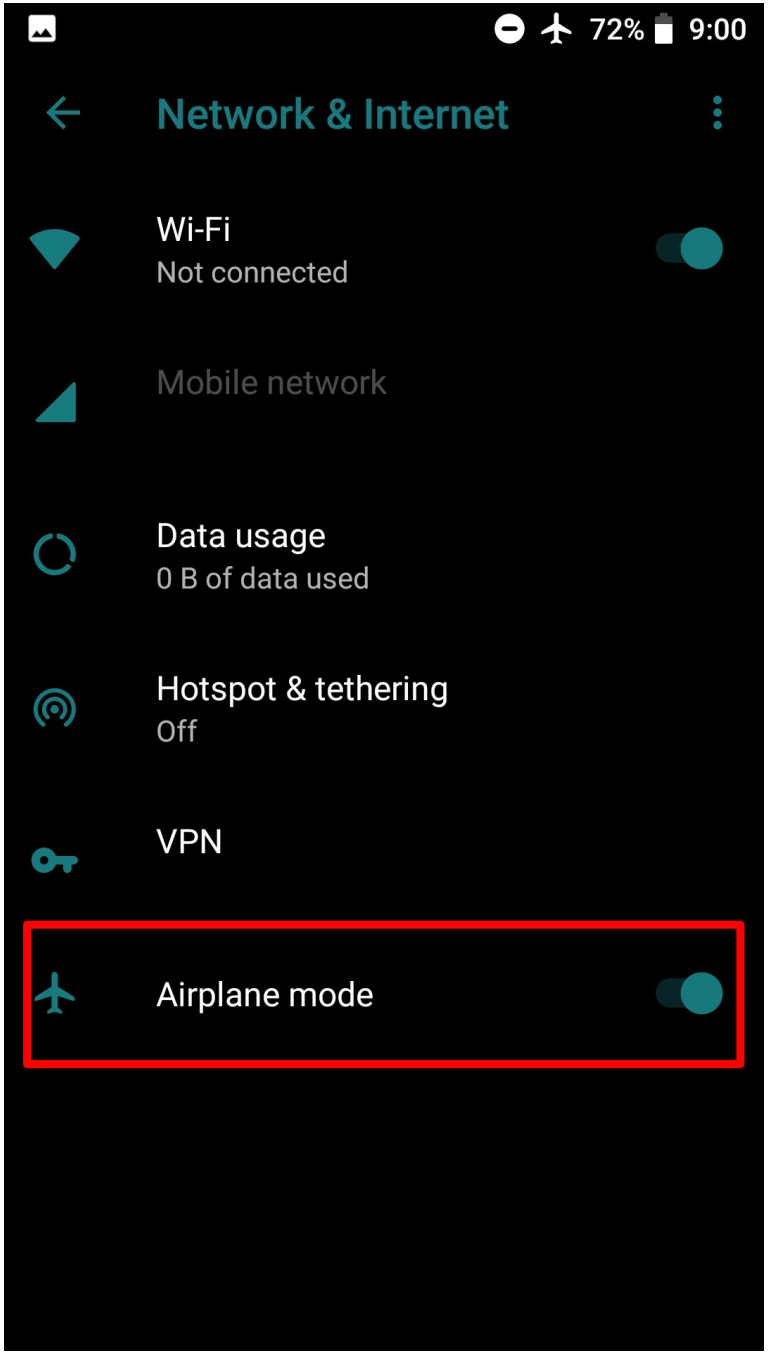
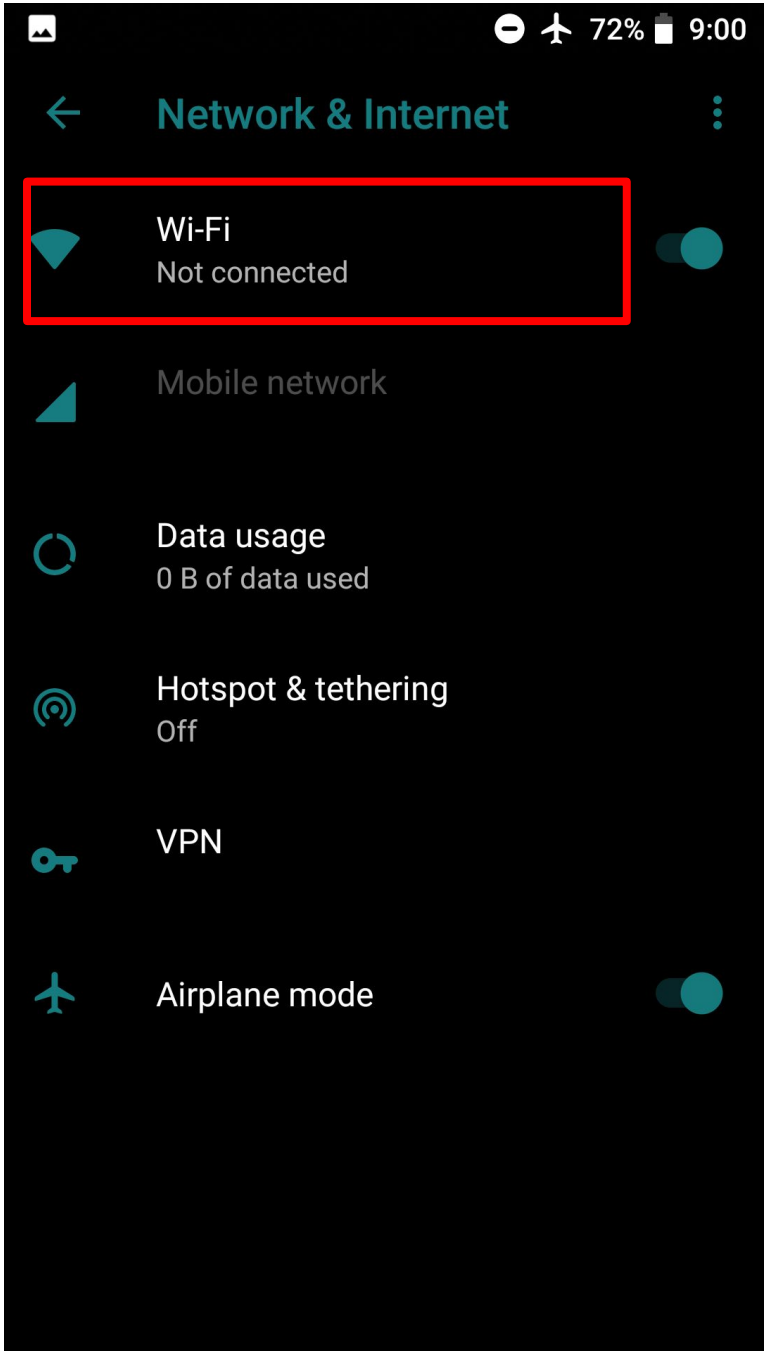
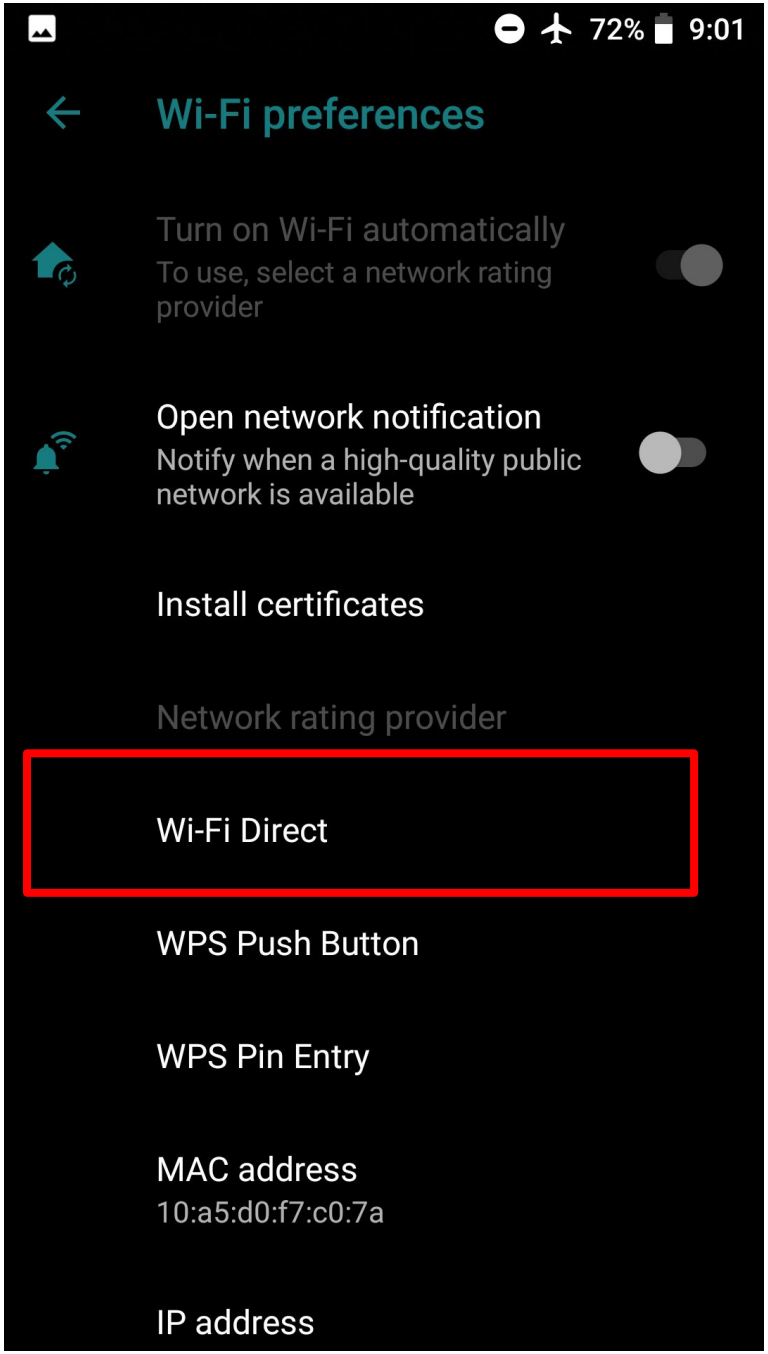

72% 9:00
Developer options
On
Always allow Wi-Fi Roam Scans
Allow/Disallow Wi-Fi Roam Scans based on the amount of data traffic present at the interface
Mobile data always active
Always keep mobile data active, even when Wi-Fi is active (for fast network switching).
Tethering hardware acceleration
Use tethering hardware acceleration if available
Select USB Configuration
Charging
Show Bluetooth devices without names
Bluetooth devices without names (MAC addresses only) will be displayed

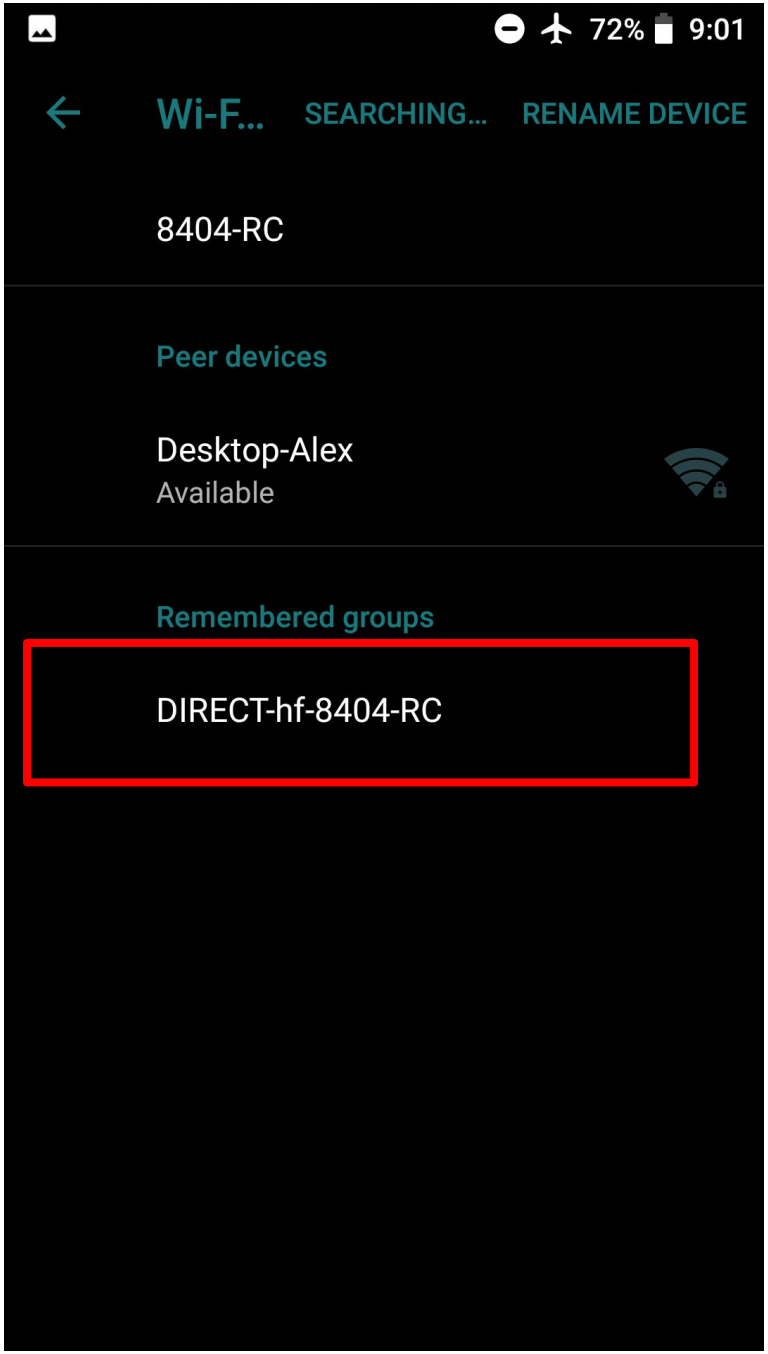

71% 9:03
Developer options
On
Manage root accesses
View and control the root rules
Debugging
Android debugging
Enable the Android Debug Bridge (ADB) interface
Debugging notify
Display a notification when USB or network debugging is enabled
ADB over network
Enable TCP/IP debugging over network interfaces (Wi-Fi, USB networks). This setting is reset on reboot
Revoke USB debugging authorizations
Device hostname

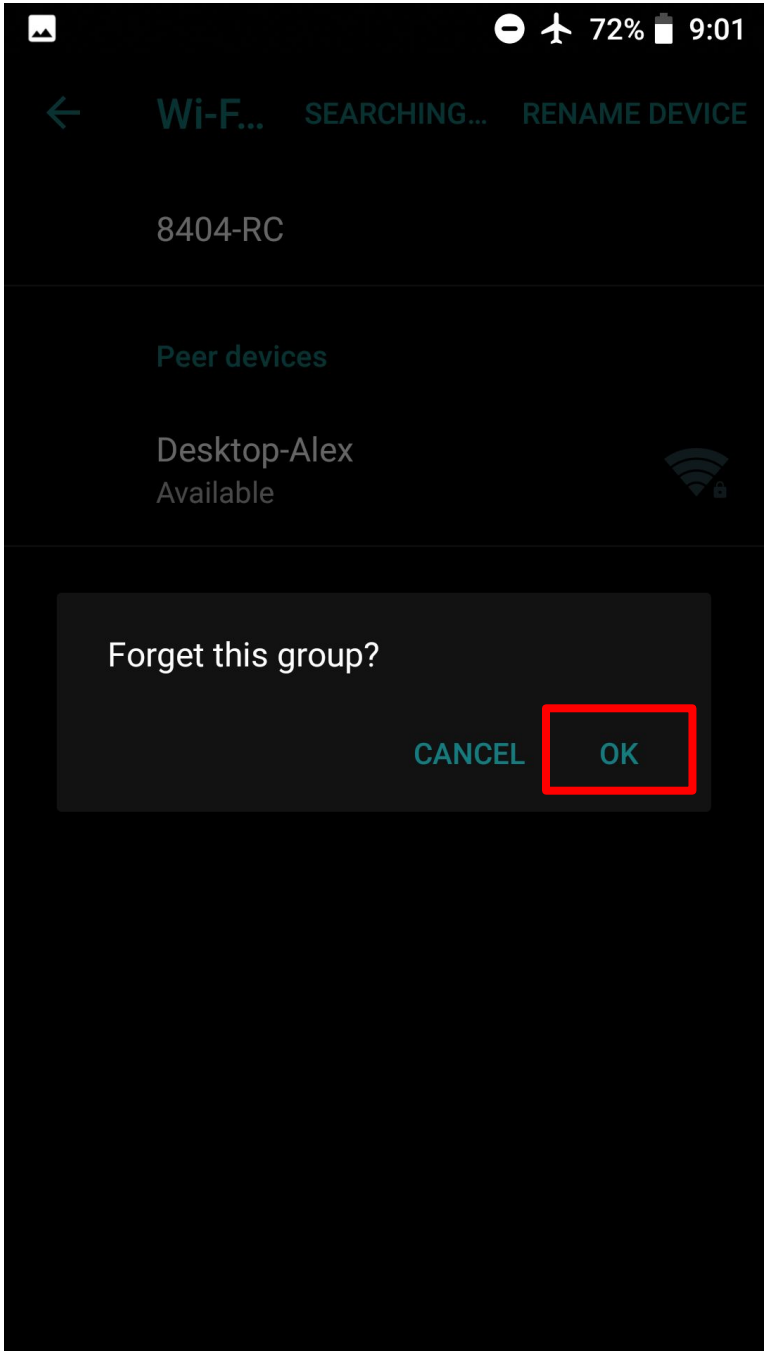

73% 8:57
Search settings
Set screen lock
Protect your device
Use fingerprint
Unlock with your fingerprint
+1
Network & Internet
Wi-Fi, mobile, data usage, hotspot
Connected devices
Bluetooth, Cast, NFC
Apps & notifications
Permissions, default apps
Battery
73% - 8h 11m left
Display
Wallpaper, sleep, font size

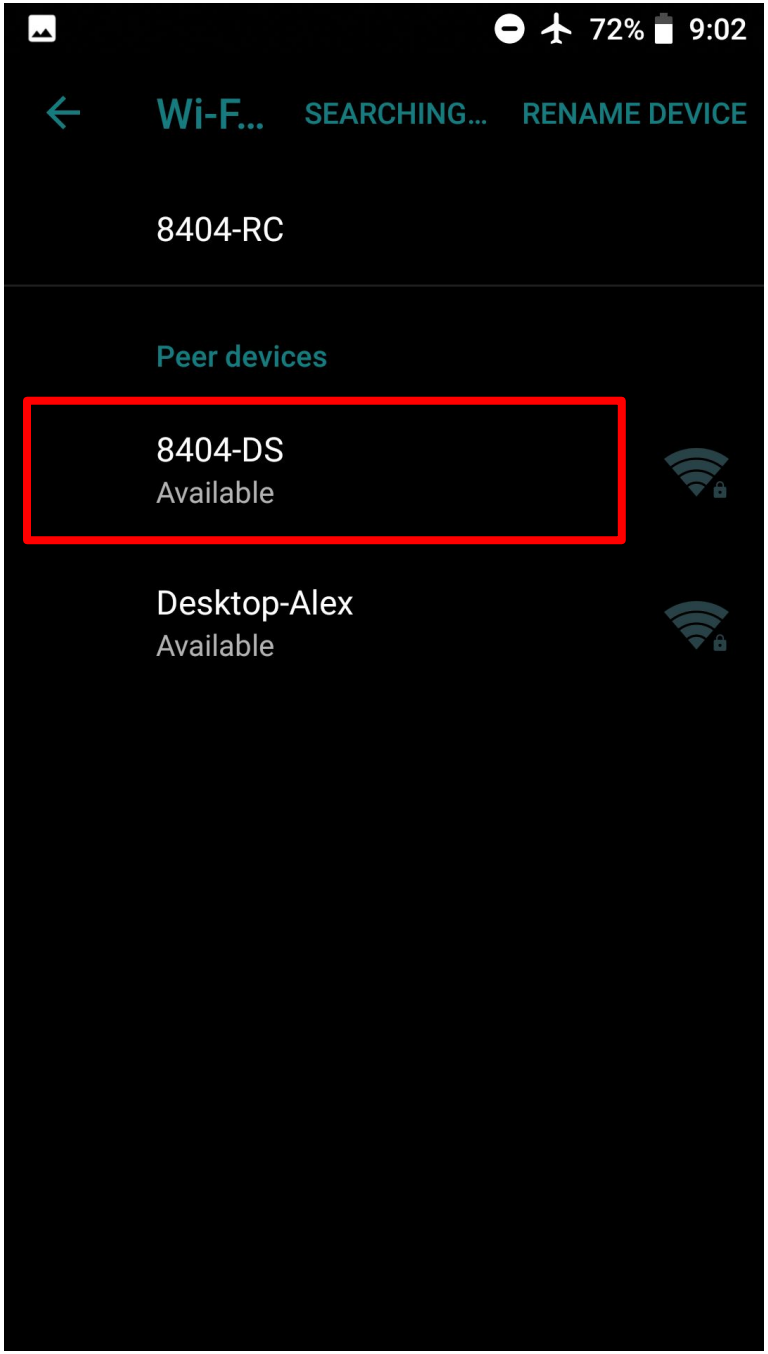

72% 9:00
Network & Internet
Wi-Fi
Not connected
Mobile network
Data usage
0 B of data used
Hotspot & tethering
Off
VPN
Airplane mode

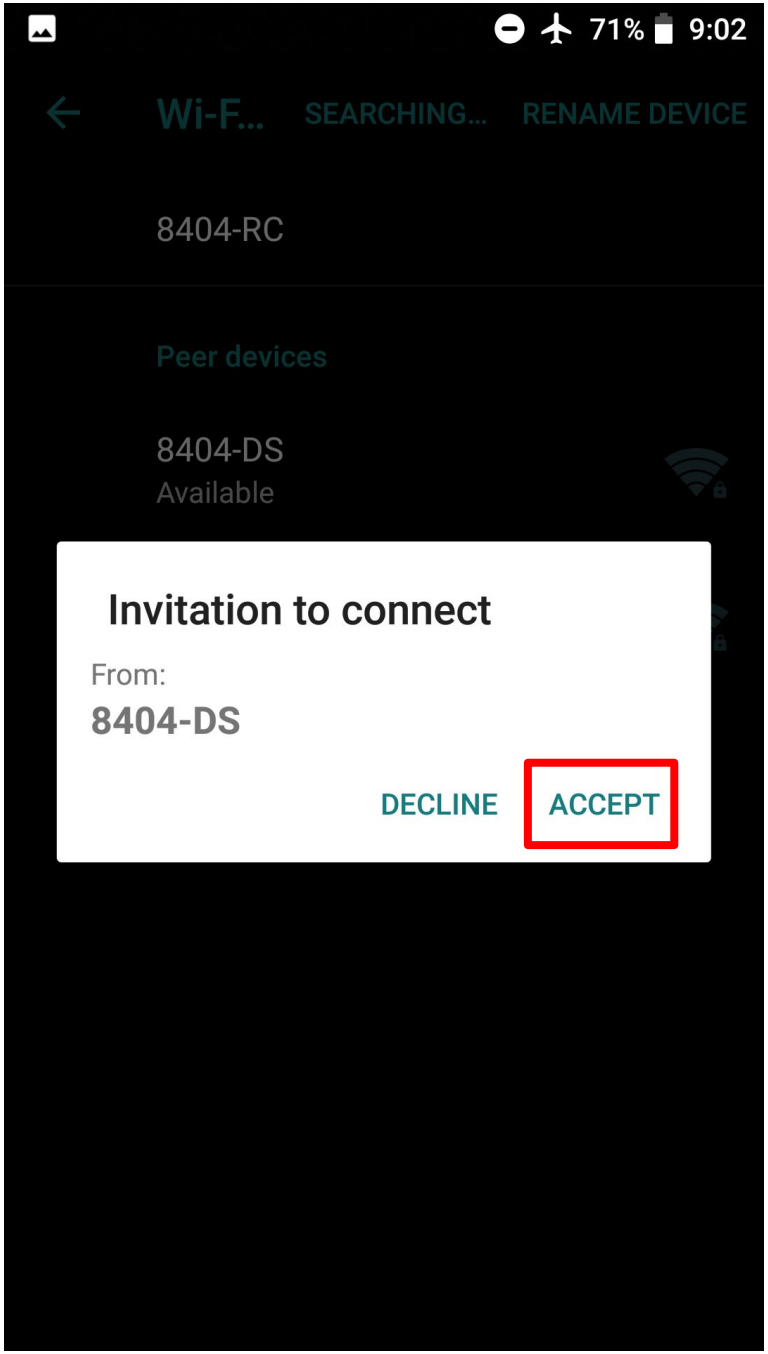

72% 9:00
Network & Internet
Wi-Fi
Not connected
Mobile network
Data usage
0 B of data used
Hotspot & tethering
Off
VPN
Airplane mode


72% 9:01
Wi-Fi preferences
Turn on Wi-Fi automatically
To use, select a network rating provider
Open network notification
Notify when a high-quality public network is available
Install certificates
Network rating provider
Wi-Fi Direct
WPS Push Button
WPS Pin Entry
MAC address
10:a5:d0:f7:c0:7a
IP address


72% 9:01
Wi-F...
SEARCHING...
RENAME DEVICE
8404-RC
Peer devices
Desktop-Alex
Available
Remembered groups
DIRECT-hf-8404-RC


72% 9:01
Wi-F...
SEARCHING...
RENAME DEVICE
8404-RC
Peer devices
Desktop-Alex
Available
Forget this group?
CANCEL
OK


72% 9:02
Wi-F...
SEARCHING...
RENAME DEVICE
8404-RC
Peer devices
8404-DS
Available
Desktop-Alex
Available


71% 9:02
Wi-F...
SEARCHING...
RENAME DEVICE
8404-RC
Peer devices
8404-DS
Available
Invitation to connect
From:
8404-DS
DECLINE
ACCEPT

Setting up Android Studio

- Download and Install Android studio
- Download and Import FIRST SDK

Google android studio

Developers Platform Android Studio Google Play Jetpack Kotlin Docs News Search LANGUAGE SIGN IN

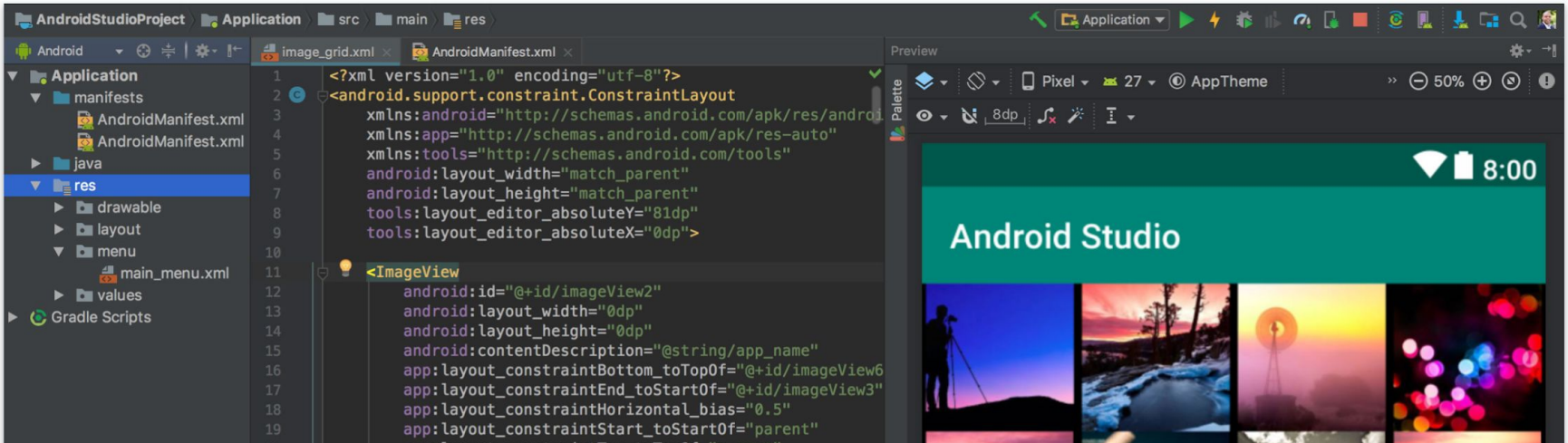
android studio

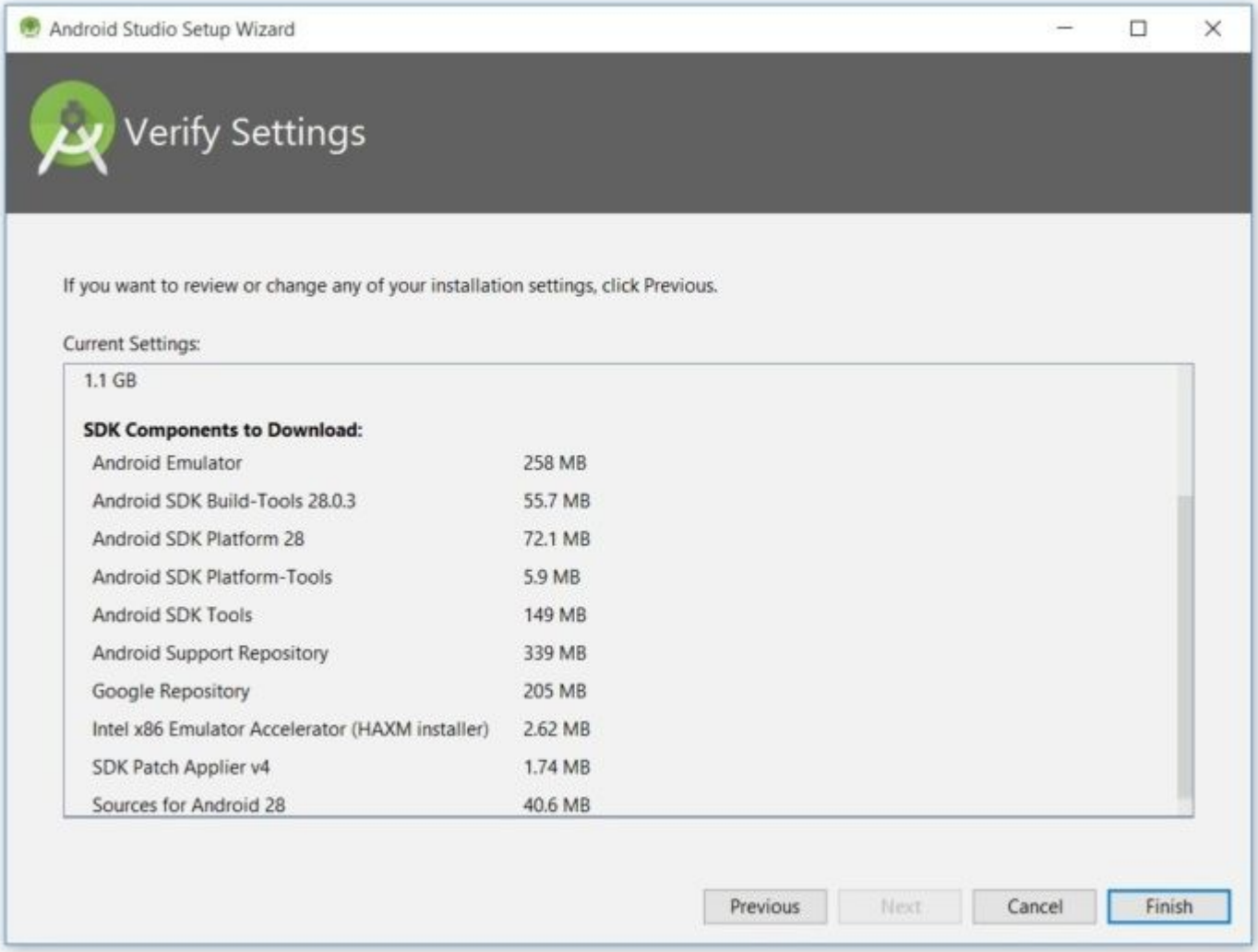
Android Studio provides the fastest tools for building apps on every type of Android device.

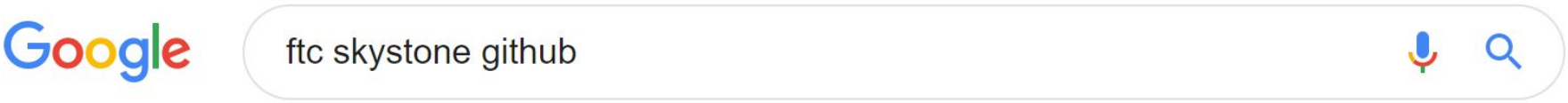
DOWNLOAD ANDROID STUDIO

3.5 for Windows 64-bit (710 MB)

DOWNLOAD OPTIONS RELEASE NOTES




Android Studio Setup Wizard
Verify Settings
If you want to review or change any of your installation settings, click Previous.
Current Settings:
1.1 GB
SDK Components to Download:
Android Emulator 258 MB
Android SDK Build-Tools 28.0.3 55.7 MB
Android SDK Platform 28 72.1 MB
Android SDK Platform-Tools 5.9 MB
Android SDK Tools 149 MB
Android Support Repository 339 MB
Google Repository 205 MB
Intel x86 Emulator Accelerator (HAXM installer) 2.62 MB
SDK Patch Applier v4 1.74 MB
Sources for Android 28 40.6 MB
Previous
Next
Cancel
Finish



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FIRST-Tech-Challenge / SkyStone

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FTC SDK https://www.firstinspires.org/robotic...

3 commits 1 branch 2 releases 1 contributor

Branch: master New pull request Find File Clone or download

CalKestis Merge pull request #22 from FIRST-Tech-Challenge/v5.1 ...

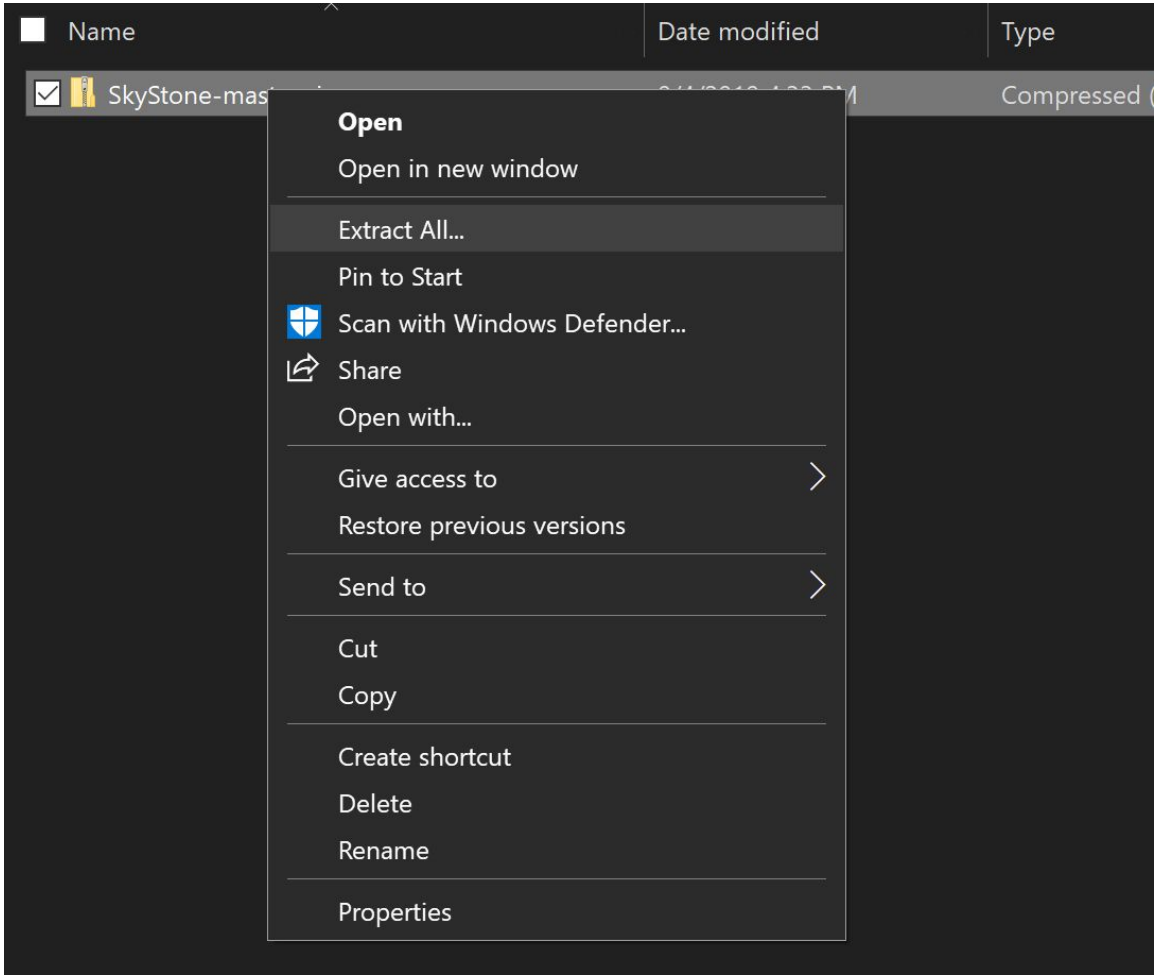
.github	SkyStone v5.0	
FtcRobotController	SkyStone v5.1	
TeamCode	SkyStone v5.1	
doc	SkyStone v5.1	
gradle/wrapper	SkyStone v5.0	3 months ago
libs	SkyStone v5.1	15 days ago
.gitignore	SkyStone v5.0	3 months ago

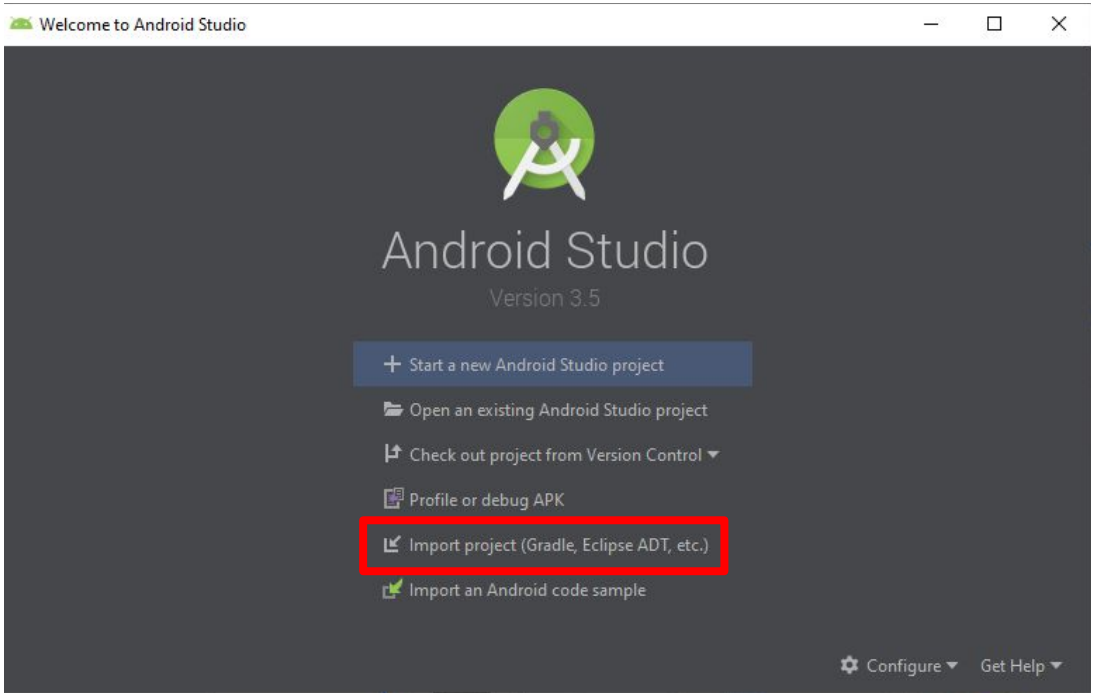
Clone with HTTPS

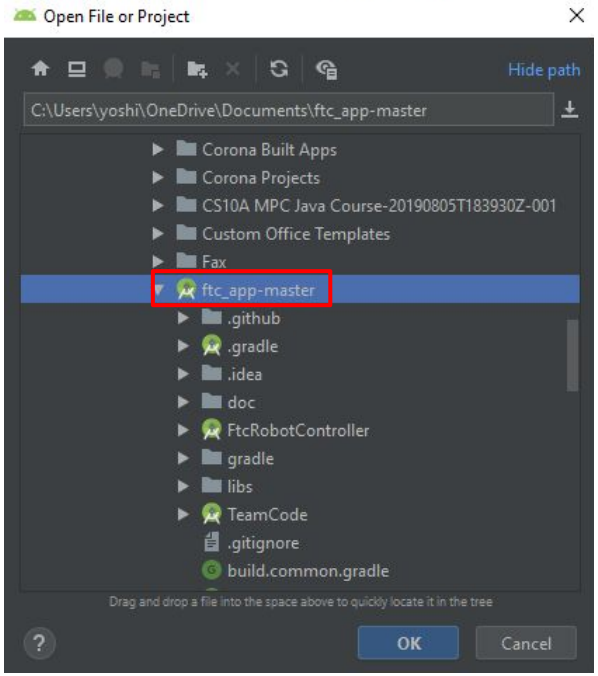
Use Git or checkout with SVN using the web URL.

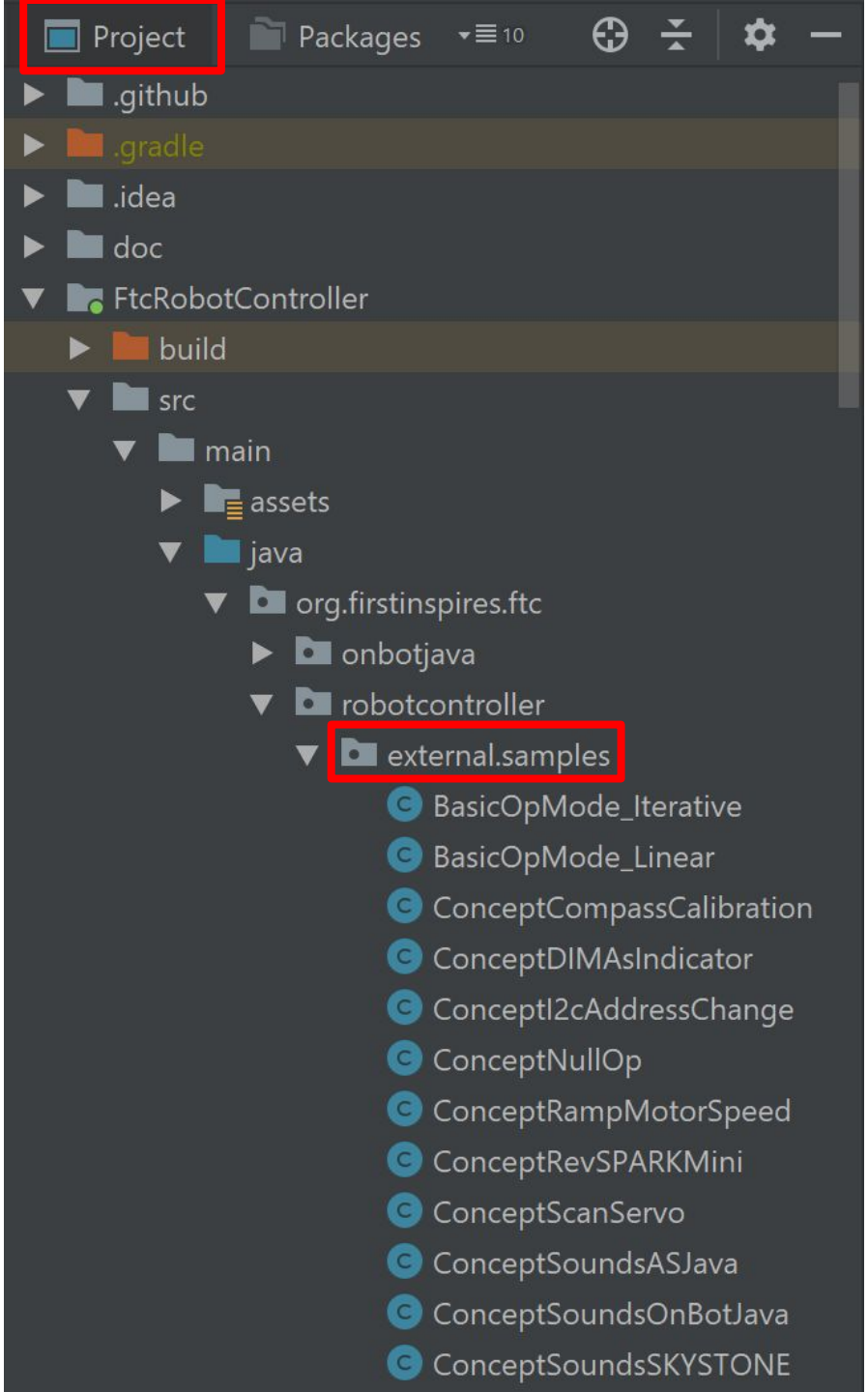
https://github.com/FIRST-Tech-Challenge/

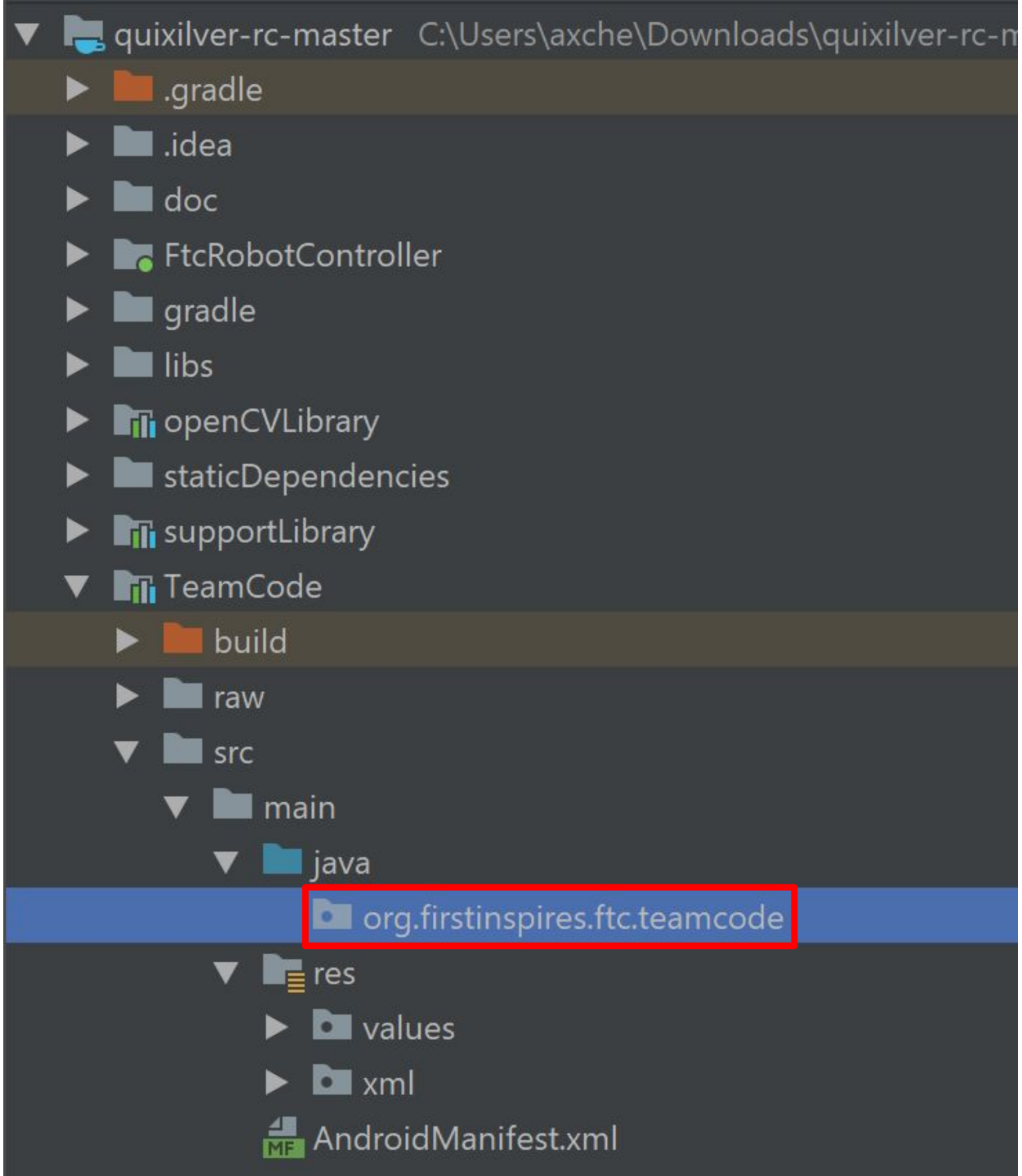
Open in Desktop Download ZIP

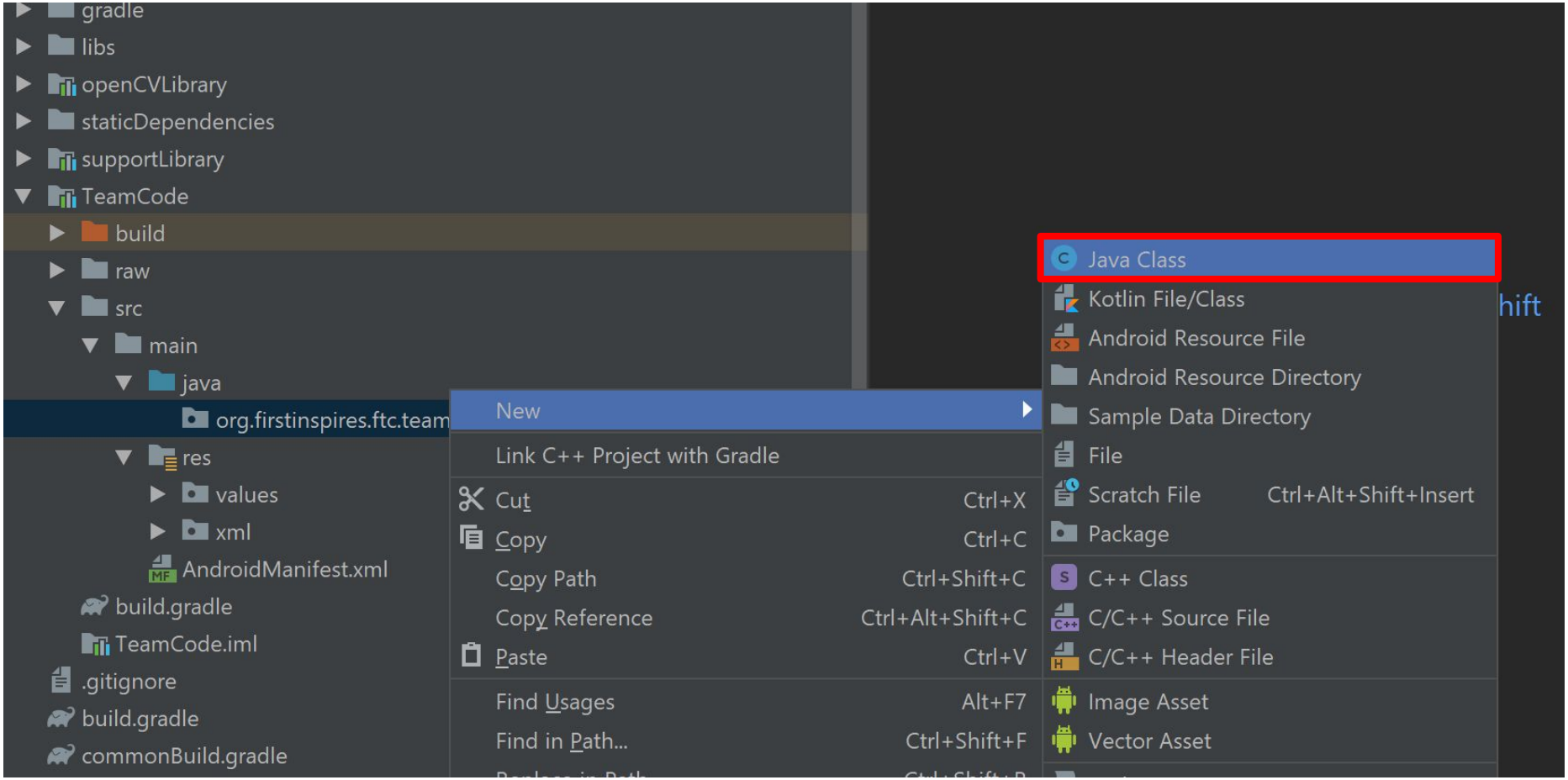

Name
Date modified
Type
SkyStone-mas
Compressed
Open
Open in new window
Extract All...
Pin to Start
Scan with Windows Defender...
Share
Open with...
Give access to
Restore previous versions
Send to
Cut
Copy
Create shortcut
Delete
Rename
Properties


Welcome to Android Studio
Android Studio
Version 3.5
Start a new Android Studio project
Open an existing Android Studio project
Check out project from Version Control
Profile or debug APK
Import project (Gradle, Eclipse ADT, etc.)
Import an Android code sample
Configure
Get Help


Open File or Project
Hide path
C:\Users\yoshi\OneDrive\Documents\ftc_app-master
Corona Built Apps
Corona Projects
CS10A MPC Java Course-20190805T183930Z-001
Custom Office Templates
Fax
ftc_app-master
.github
.gradle
.idea
doc
FtcRobotController
gradle
libs
TeamCode
.gitignore
build.common.gradle
Drag and drop a file into the space above to quickly locate it in the tree
OK
Cancel


Project
Packages
10
.github
.gradle
.idea
doc
FtcRobotController
build
src
main
assets
java
org.firstinspires.ftc
onbotjava
robotcontroller
external.samples
BasicOpMode_Iterative
BasicOpMode_Linear
ConceptCompassCalibration
ConceptDIMAsIndicator
ConceptI2cAddressChange
ConceptNullOp
ConceptRampMotorSpeed
ConceptRevSPARKMini
ConceptScanServo
ConceptSoundsASJava
ConceptSoundsOnBotJava
ConceptSoundsSKYSTONE


quixilver-rc-master C:\Users\axche\Downloads\quixilver-rc-m
.gradle
.idea
doc
FtcRobotController
gradle
libs
openCVLibrary
staticDependencies
supportLibrary
TeamCode
build
raw
src
main
java
org.firstinspires.ftc.teamcode
res
values
xml
AndroidManifest.xml


gradle
libs
openCVLibrary
staticDependencies
supportLibrary
TeamCode
build
raw
src
main
java
org.firstinspires.ftc.team
res
values
xml
AndroidManifest.xml
build.gradle
TeamCode.iml
.gitignore
build.gradle
commonBuild.gradle
New
Link C++ Project with Gradle
Cut Ctrl+X
Copy Ctrl+C
Copy Path Ctrl+Shift+C
Copy Reference Ctrl+Alt+Shift+C
Paste Ctrl+V
Find Usages Alt+F7
Find in Path... Ctrl+Shift+F
Java Class
Kotlin File/Class
Android Resource File
Android Resource Directory
Sample Data Directory
File
Scratch File Ctrl+Alt+Shift+Insert
Package
C++ Class
C/C++ Source File
C/C++ Header File
Image Asset
Vector Asset

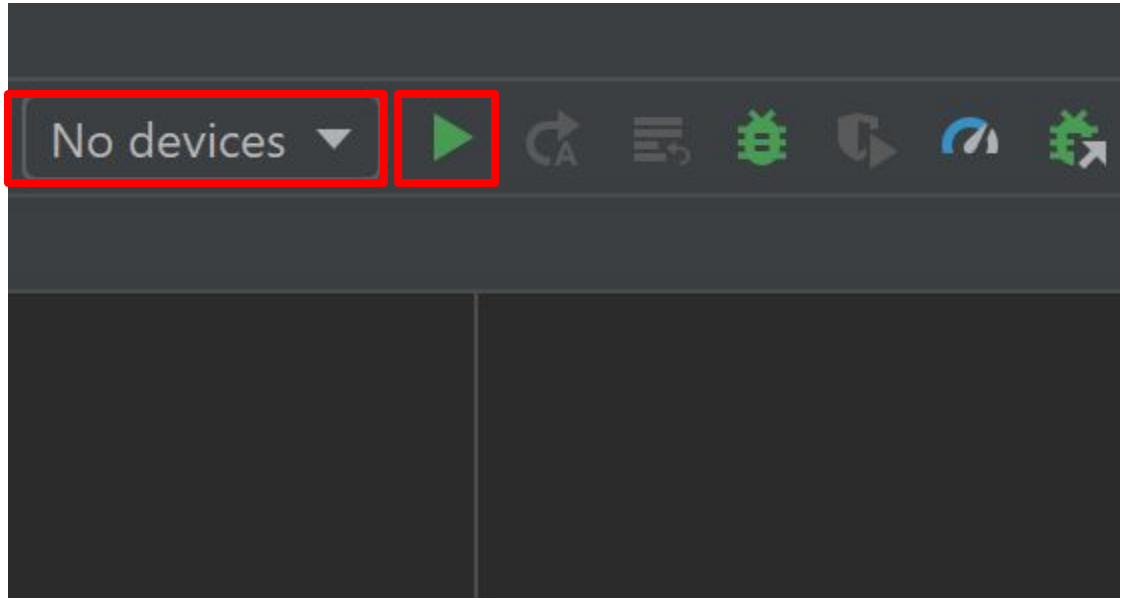
Java Demo Code

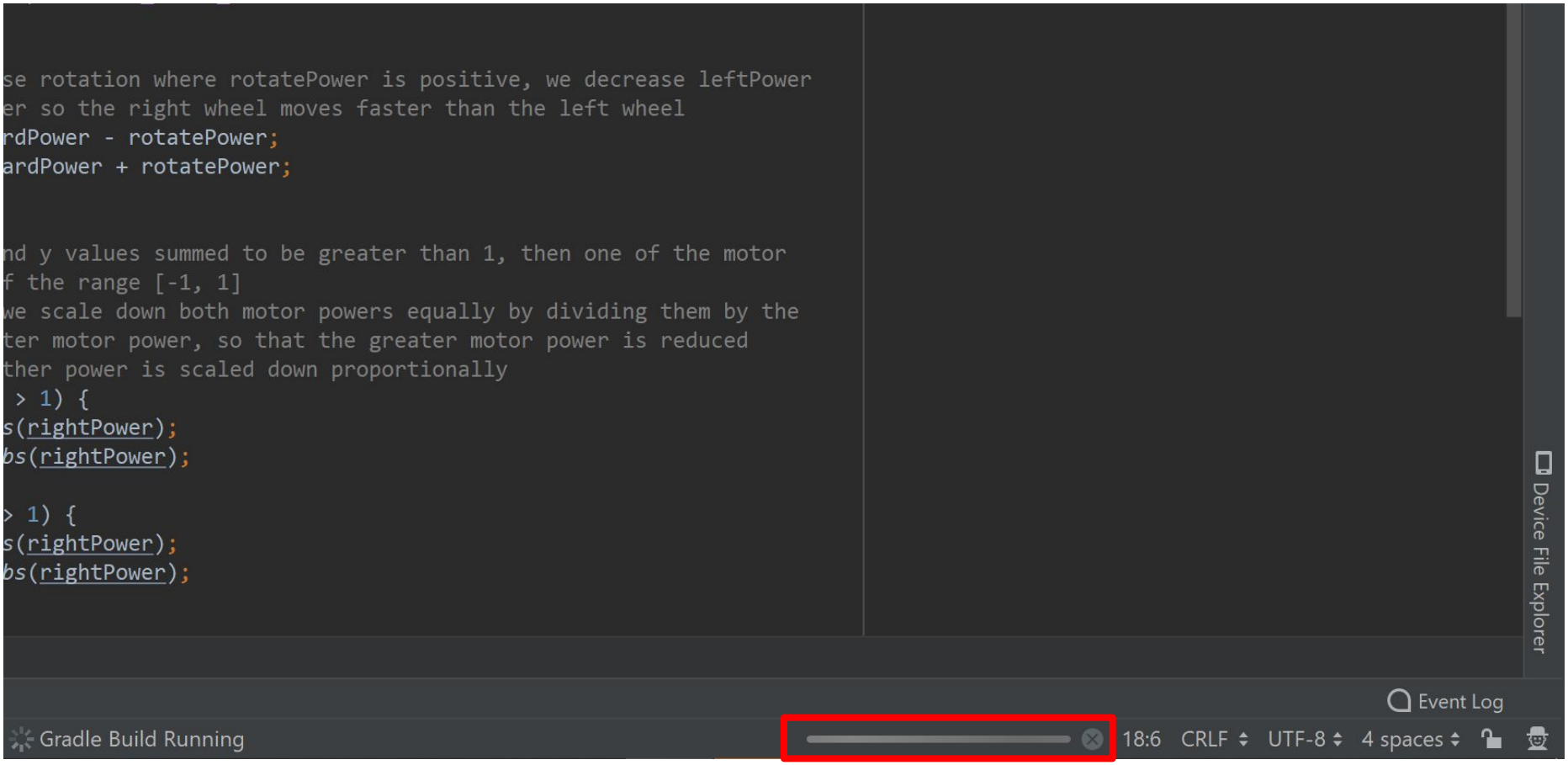
https://pastebin.com/jkaqdWpC

https://pastebin.com/gWch4GsA

Uploading Code to the Robot Controller Phone

1. Use a USB cable to plug the phone into your computer
2. Accept the “Trust this computer” pop-up in android
3. Select the run button in Android Studio
4. Wait for Android studio to compile and transfer the code


No devices


se rotation where rotatePower is positive, we decrease leftPower
er so the right wheel moves faster than the left wheel
rdPower - rotatePower;
ardPower + rotatePower;
nd y values summed to be greater than 1, then one of the motor
f the range [-1, 1]
we scale down both motor powers equally by dividing them by the
ter motor power, so that the greater motor power is reduced
ther power is scaled down proportionally
> 1) {
s(rightPower);
bs(rightPower);
> 1) {
s(rightPower);
bs(rightPower);
Device File Explorer
Event Log
Gradle Build Running
18:6
CRLF
UTF-8
4 spaces