2338 Software Engineering

Robot Programming: Computer Setup

Laptop

- Laptop running MS Windows
- Administrator permissions
- ≈ 30Gb-112.67Gb space

BRING YOUR LAPTOP

There is nothing you can do without it. I don't think you can push code to github without one unless you got a neuralink.

Bring it everywhere

Now that you are a programmer there is always a need for one, no matter where you are

If you don't bring one you might not have anything to do

BRING YOUR LAPTOP

List of Applications

- JDK (Java Development Kit)
- IntelliJ
- GitKraken
- FRC Game Tools
- WPILib library

Special Applications (not for everyone)

- Robot Characterization Tool (Optional)
  - Python
  - Not in this training
- VS Code (Optional)
  - Only needed for new projects

Installing JDK

1. Download Java JDK from oracle.com:
   a. 2019-2022: https://www.oracle.com/java/technologies/javase/jdk11-archive-downloads.html
   b. 2023: https://www.oracle.com/java/technologies/downloads/#jdk17-windows
2. Download the jdk-xxxx.exe file for your OS and architecture
   a. 2019-2022 jdk-11.02
   b. 2023 jdk-17.06
   c. If necessary, create an Oracle account using school ID
3. Run install script
4. Verify
   a. Windows
      i. Open Command prompt
         1. Type “Command” in Windows search bar
      ii. Type “java -version”
         1. Should return “java version …”
      iii. See next slide to troubleshoot java installation

Troubleshooting Windows Java installation

1. Type “command” in Windows search bar
2. Type “echo %JAVA_HOME%”
    a. If “%JAVA_HOME%” is returned, you need to set the JAVA_HOME environment variable
        i. Type “Environment” in Windows search bar
        ii. System Properties opens
        iii. Select “Environment Variables”
        iv. Select New
        v. Set Variable Name to: JAVA_HOME
        vi. Set Variable Value to Java location below
            1. c:\Program Files\Java\jdk-11.0.2
3. Add JAVA_HOME to path
    a. Select PATH and click Edit
    b. Select “New”
    c. Type %JAVA_HOME%
    d. Select OK to exit all system properties windows
    e. Open a new command window and test “java -version” again

Installing IDE

1. Goto:
    a. https://www.jetbrains.com/idea/download
2. Download the Community .exe for your OS and architecture
3. Run install script
    a. No special options necessary

If you already have Intelli-J installed from a previous year, you can select Help | Check for updates…
Intelli-J may update to intermediate releases before getting to the final release

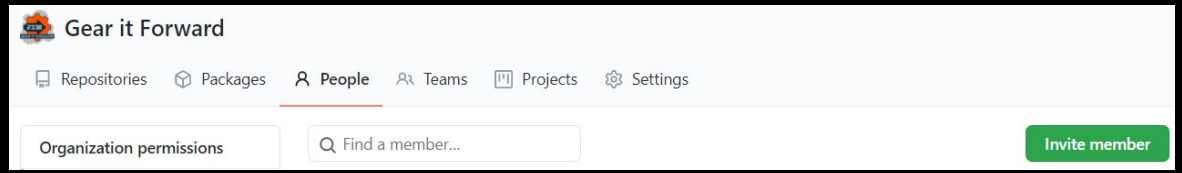
Installing GitKraken

1. Goto:
   a. https://www.gitkraken.com/download
2. Download the .exe file for your OS and architecture
3. Run install script

Create GitHub Account (if you don't have one)

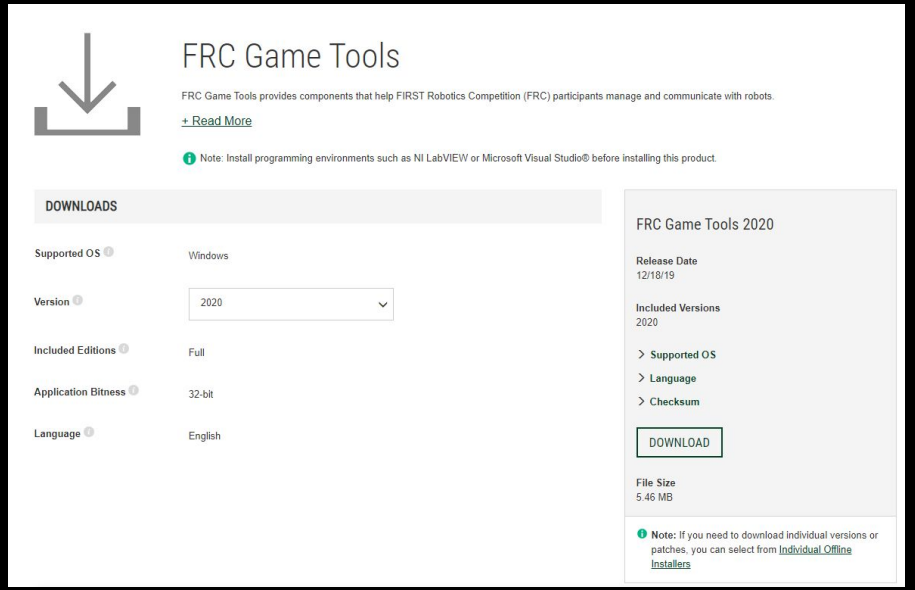
1. Github.com
2. Select "Sign up"
3. Follow sign-up instructions

GitHub Admins: Invite new users to GitHub via:



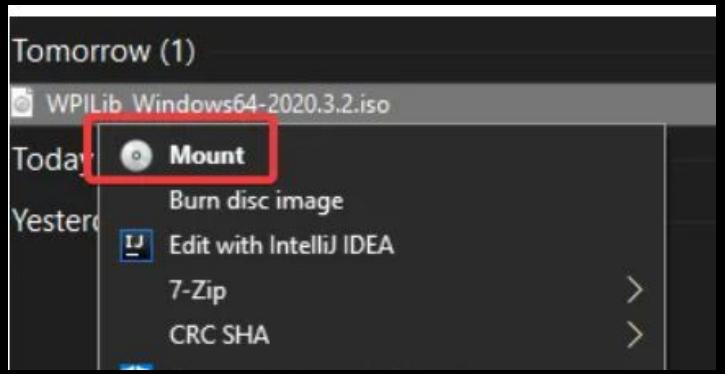
Installing FRC Game Tools

1. Search “frc game tools” and open the National Instruments webpage
   a. https://www.ni.com/en-us/support/downloads/drivers/download.frc-game-tools.html
2. Download the game tools for the most recent year (not recommended on slow school wifi)
3. Install Game Tools from the downloaded exe
   a. Install with all default options
   b. Create an NI User Account when prompted
      i. Use your school email address
   c. When asked for an NI license, just close the window
   d. You will be asked to reboot. Go ahead and reboot.

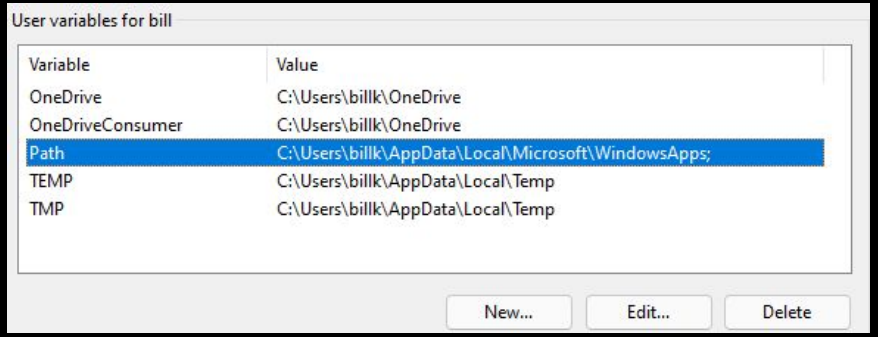


Installing WPILib

1. Find latest on github
   a. https://github.com/wpilibsuite/allwpilib/releases
2. Expand “Assets”
3. Select WPILib_Windows64_YYYY.iso
4. Mount ISO (right click file and select Mount)
5. Open WPILibInstaller
   a. Install everything for all users
   b. Select Download for this computer only



Updating execution path



1. Windows Search
2. Select “Edit the System Environment Variables”
3. Select “Environment Variables”
4. Select user variable “Path” and “Edit”
5. Select “New” and type “buildscripts”
6. Select “Ok”, “Ok”, “Ok” to close related System Environment windows

Note: Typically you would use “.\buildscripts” but Powershell does not persist the environment update when .\ is used

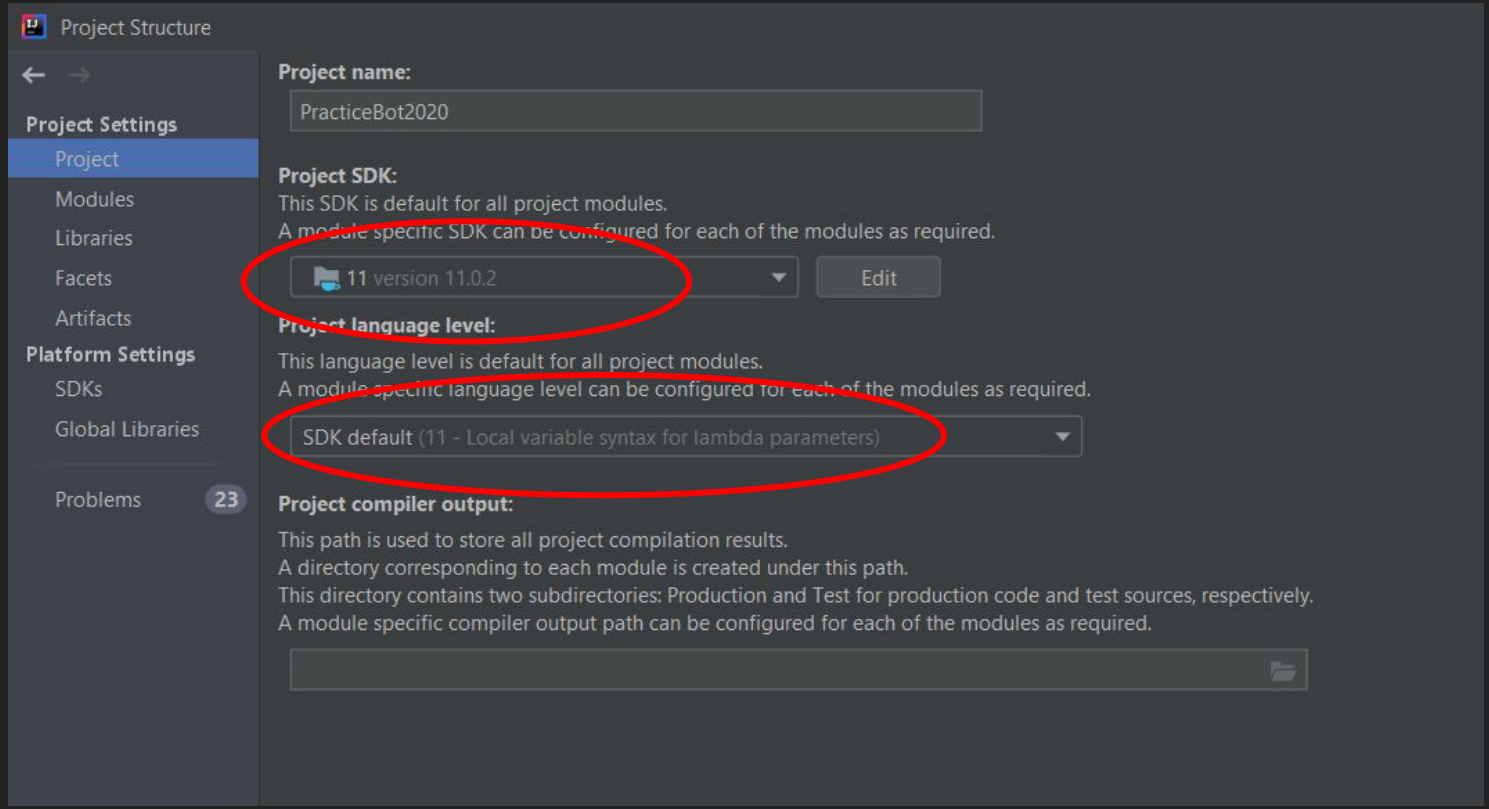
Historical Versions

Year	Java JDK “C:\Program Files\Java” jdk-x.x.x	Intell-J	FRC Game Tools	GitKraken	WPILib
2023	SE 17.0.6	Community 2022.3.1	2023	9.0.1	2023.2.1
2022	SE 11.0.2	Community 2021.3.1	2022 f1	8.2.1	2022.3.1
2021	SE 11.0.2	Community 2020.3	2021	7.x	

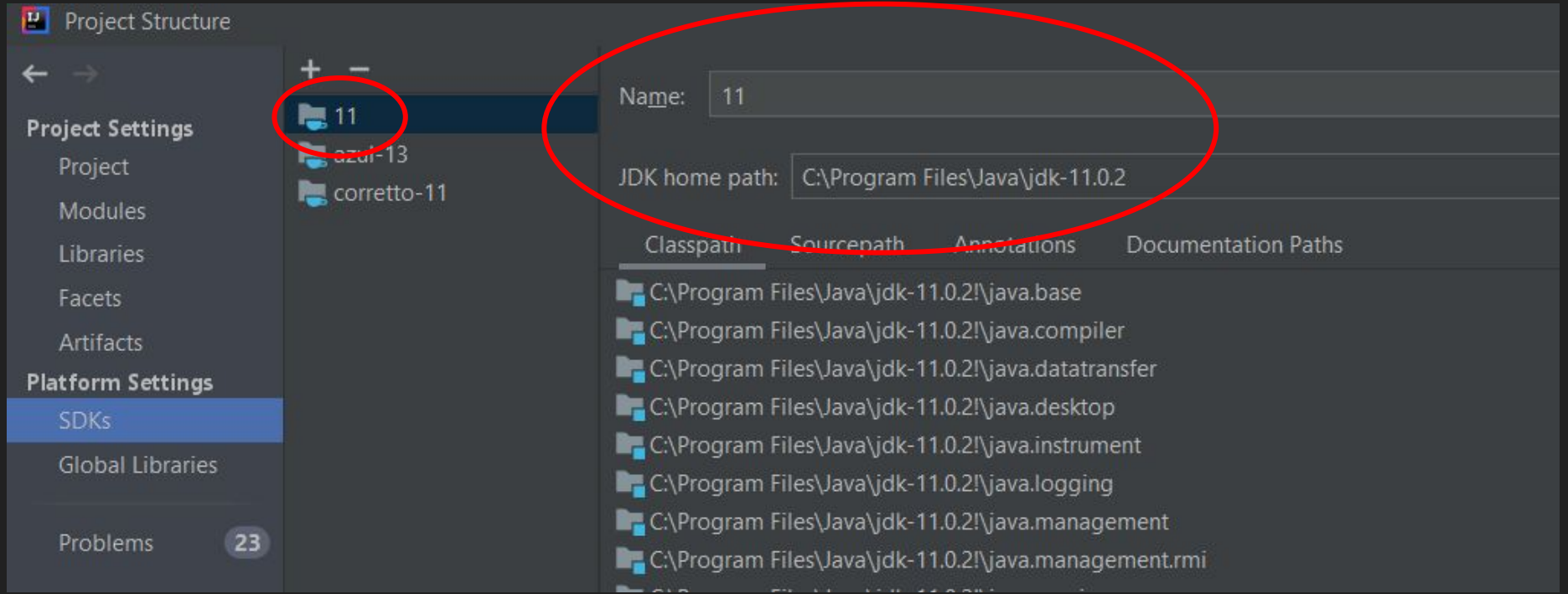
Additional Tools (optional)

- Phoenix Tuner - Updates Talon and Pigeon firmware
  - Phoenix Framework Software from CTR Electronics
- Rev Hardware Client - Updates SparkMax firmware
  - Rev SparkMax Client has been discontinued

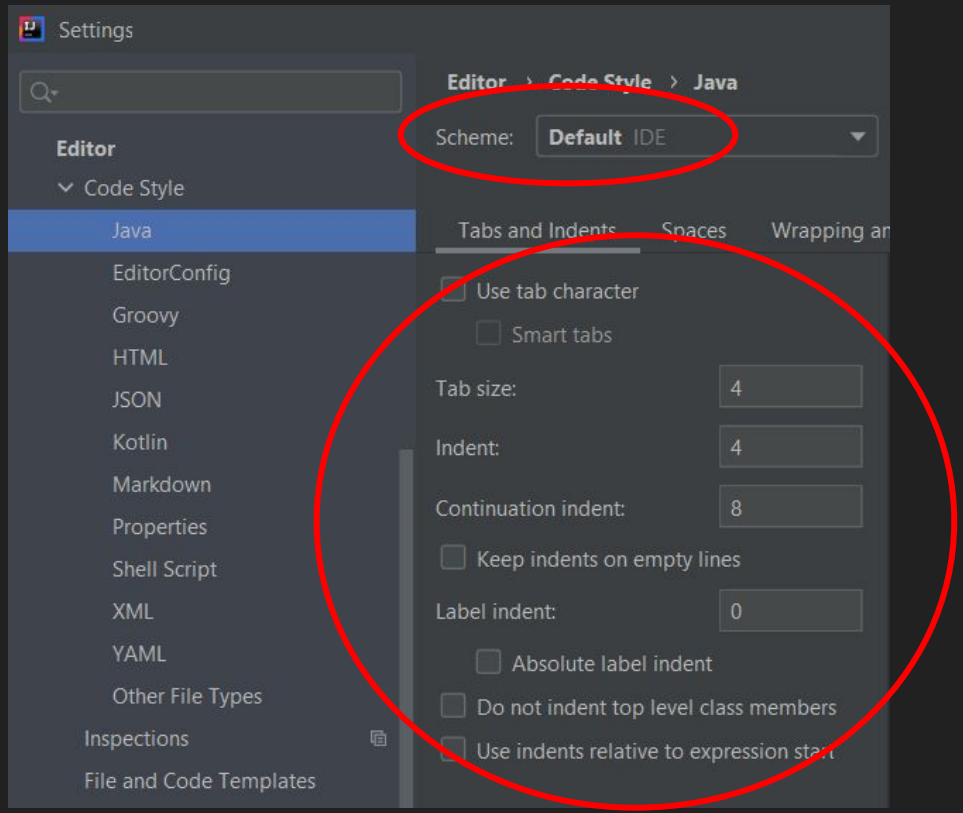
Additional Setup Debugging



Additional Setup Debugging



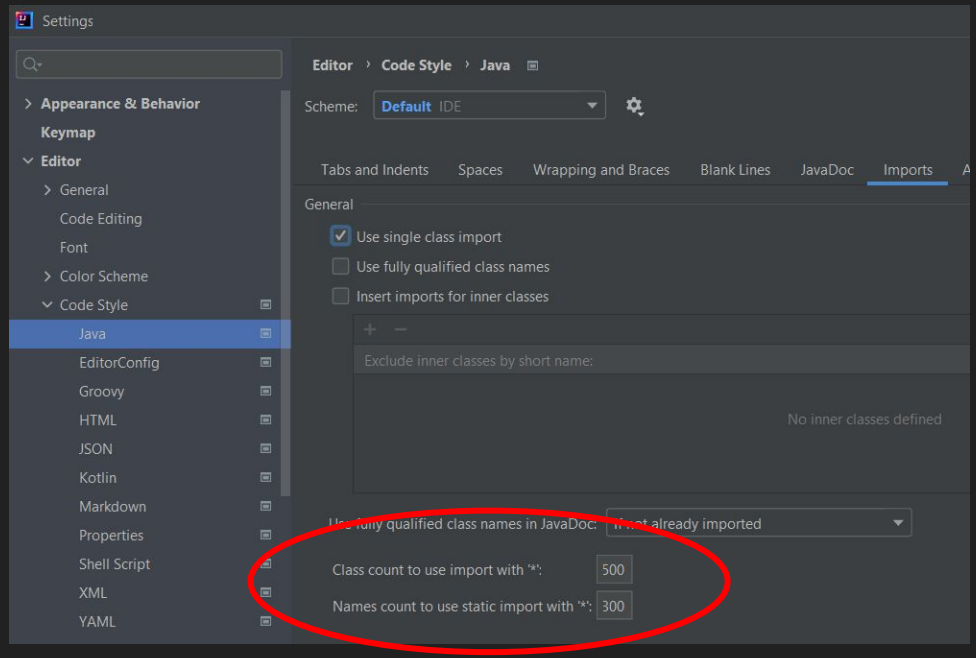
Intelli-J Editor Settings - tabs



Intelli-J Editor Settings - imports

File | Settings | Editor | Code Style | Java | Imports

Class count to use import with *: 500
Names count to use static import with *: 300



Setting up project for new year (eg 2022 -> 2023)

- Modify folder structure
  - …/src/main/java/frc/robot -> …/src/main/java/team/gif/robot
- Modify build.gradle
  - "frc.robot.Main" -> "team.gif.robot.Main"
- Copy .../FRC2022/buildscripts to …/FRC2023
- Modify .gitignore (add .idea to file - see 2022 .gitignore file)
- Copy README.md and modify as appropriate

Useful libraries and files to carry over

- …/src/main//java/team/gif/lib/*
- …/robot/commands/autos/Mobility
- …/robot/commands/drivetrain/*
- …/robot/subsystems/drivers/*
- …/robot/subsystems/Drivetrain
- …/robot/Constants (remove season specific constants)
- …/robot/Globals (remove season specific globals)
- …/robot/OI (remove season specific actions)
- …/robot/Robot (skim through and copy non season-specific functionality)
- …/robot/RobotContainer (skim through …)
- …/robot/RobotMap (skim through …)
- …/robot/UI (skim through …)
- …/robot/UiSmartDashboard (skim through …)

GitHub settings

- Create project workflow
- Link project workflow to project
- Modify workflow tab titles
- Restrict merge to main
- Automate new issue to “ToDo” tab

Installing VS Code (Optional) - DO NOT DO

This is used ONLY for creating brand new projects

1. Download and install here
2. Open VS Code
3. Install the WPIlib extension
    a. Go to “Extensions” in the sidebar
    b. Search for WPILib on their extension library
    c. Install extension