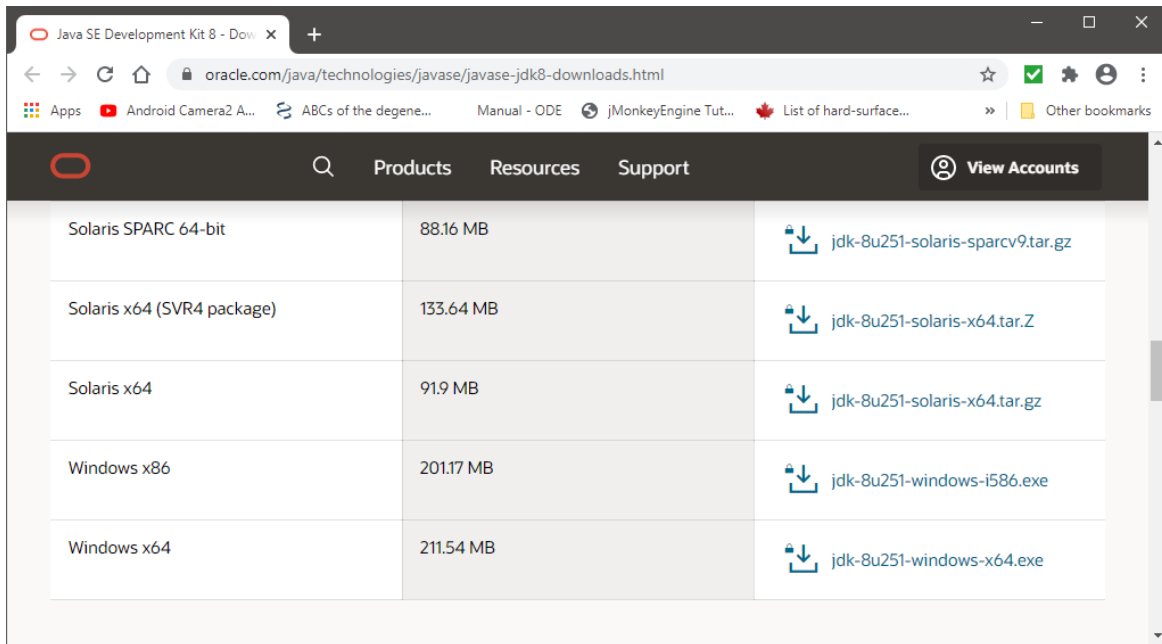


## Virtual Robot – Detailed Installation Instructions

**I. If you don't already have Java Development Kit Version 8 (JDK 8) installed on your system, you need it. You can get this from Oracle OR use Amazon Corretto 8 or Bell Liberica 8 instead.**

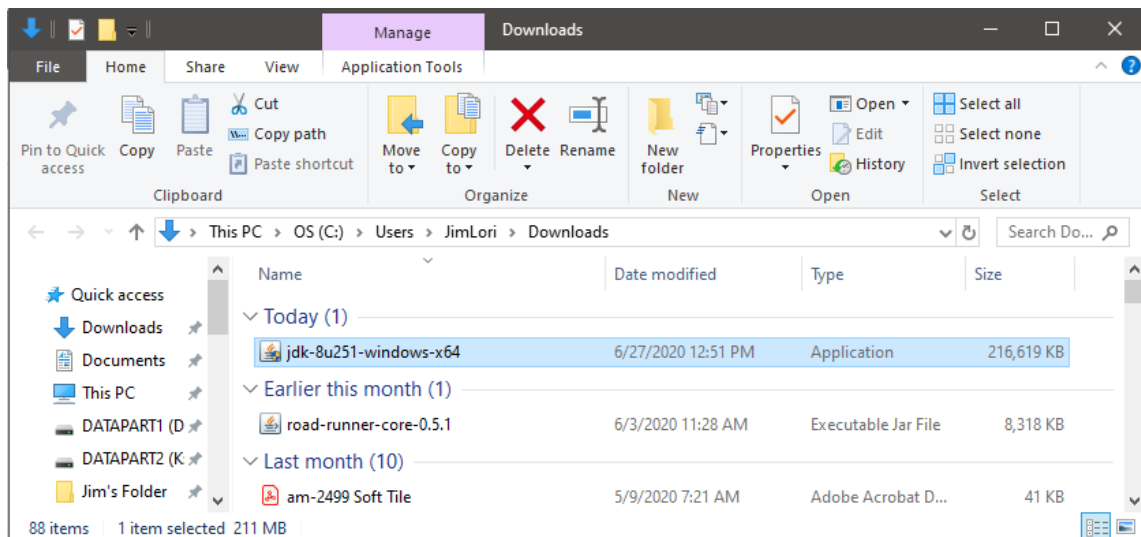
**A. To get from Oracle (requires free account):** Open a browser and navigate to:

<https://www.oracle.com/java/technologies/javase/javase-jdk8-downloads.html>



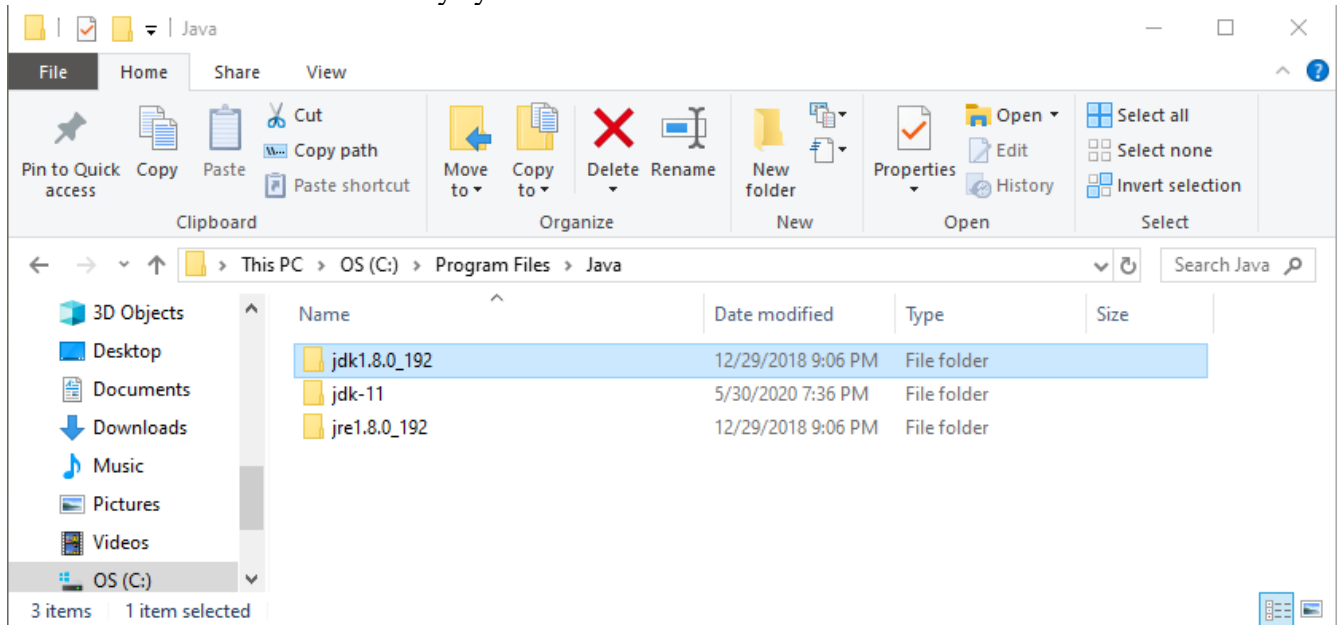
Download the appropriate JDK8 installer for your system (e.g., Windows x64). Unfortunately, Oracle now requires that you create an account for this (you will be prompted to do so), but it is free. (Note: an account is NOT needed if you use Amazon Corretto instead of Oracle JDK8)

JDK8 installer file in my Downloads folder:



Run the installer (e.g., jdk-8u251-windows-x64.exe) that you have downloaded. This will install JDK8 on your system. You'll be prompted for the location that you want this installed to. By accepting the default, the path to the JDK8 on my system is: C:\Program Files\Java\jdk1.8.0\_192. You should find something similar.

JDK8 installation folder on my system:



## B. To get Amazon Corretto 8 as your JDK (no account needed, but doesn't support Mac):

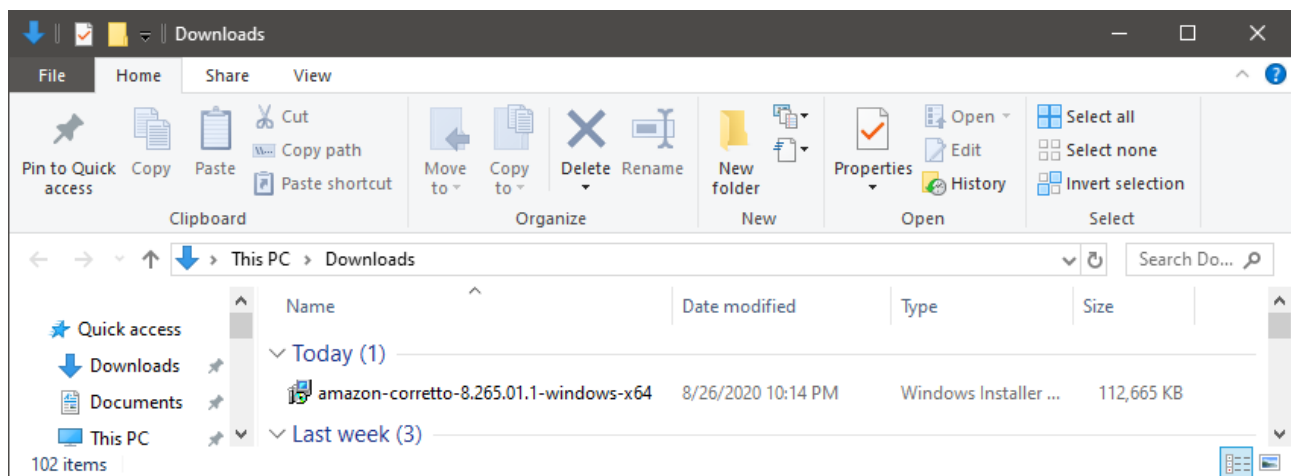
Open a browser and navigate to:

<https://docs.aws.amazon.com/corretto/latest/corretto-8-ug/downloads-list.html>

The screenshot shows the Amazon Corretto 8 User Guide page for downloads. The browser address bar shows the URL: <https://docs.aws.amazon.com/corretto/latest/corretto-8-ug/downloads-list.html>. The page title is "Amazon Corretto Corretto 8 User Guide". The left sidebar contains a navigation menu with links to "What Is Amazon Corretto 8?", "List of Patches for Amazon Corretto 8", "Linux", "Windows", "macOS", "Docker", "Downloads" (highlighted), and "Document History". The main content area has a heading "Downloads" and a subheading "Permanent URLs always point to the most recent release of a package. For example, to retrieve the latest Linux Corretto 8 .tgz package by using a Permanent URL, you can run the following command from the CLI:". Below this is a code block containing the command: `wget https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.tar.gz`. A note states: "These links can be used in scripts to pull the latest version of Amazon Corretto 8." Below the note is a table with columns: Platform, Type, Download Link, and Checksum (MD5). The table lists download links for Linux (aarch64), Windows (x64 and x86), and macOS (x64) for both JDK and JRE. The table is partially obscured by a scrollbar on the right. A note at the bottom states: "Note: Notice that the above links follow this format:".

Platform	Type	Download Link	Checksum (MD5)
aarch64		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.deb">corretto-8-aarch64-linux-jdk.deb</a>	corretto-8-aarch64-linu
		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.rpm">https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.rpm</a>	https://corretto.aws/do
		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.tar.gz">https://corretto.aws/downloads/latest/amazon-corretto-8-aarch64-linux-jdk.tar.gz</a>	https://corretto.aws/do
Windows x64	JDK	<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jdk.msi">https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jdk.msi</a>	https://corretto.aws/do
		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jdk.zip">https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jdk.zip</a>	https://corretto.aws/do
		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jre.zip">https://corretto.aws/downloads/latest/amazon-corretto-8-x64-windows-jre.zip</a>	https://corretto.aws/do
Windows x86	JDK	<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-x86-windows-jdk.msi">https://corretto.aws/downloads/latest/amazon-corretto-8-x86-windows-jdk.msi</a>	https://corretto.aws/do
		<a href="https://corretto.aws/downloads/latest/amazon-corretto-8-x86-windows-jdk.zip">https://corretto.aws/downloads/latest/amazon-corretto-8-x86-windows-jdk.zip</a>	https://corretto.aws/do

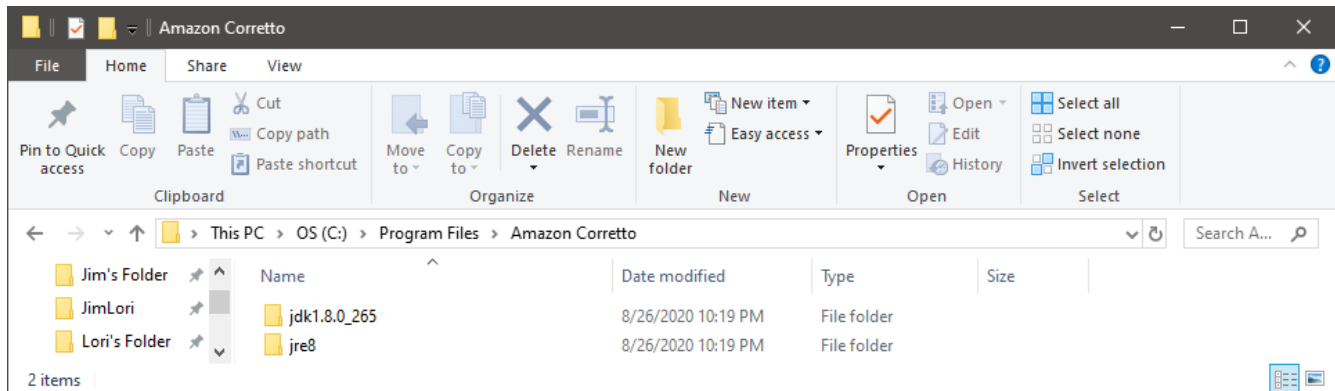
Download the JDK for your operating system.  
Here's the installer file in my Downloads folder:



Run the installer file. On my system, it installed the Amazon Corretto JDK8 to:

C:\Program Files\Amazon Corretto\jdk1.8.0\_265

as shown here:



### C. To get Bell Liberica JDK 8 as your JDK (no account needed, works with Mac):

I'm adding this option because I learned recently that Amazon Coretto for Apple MacIntosh doesn't include JavaFx, and therefore won't run the virtual\_robot simulator. These instructions will therefore be for Mac users.

Open a browser and navigate to [Download OpenJDK builds of Liberica JDK, Java 8, 11, 17, 18 | BellSoft Java \(bell-sw.com\)](#)

Download the JDK for your operating system (e.g., macOS). The downloaded file is a .dmg file (on my system "bellsoft-jdk8u345+1-macos-amd64.dmg").

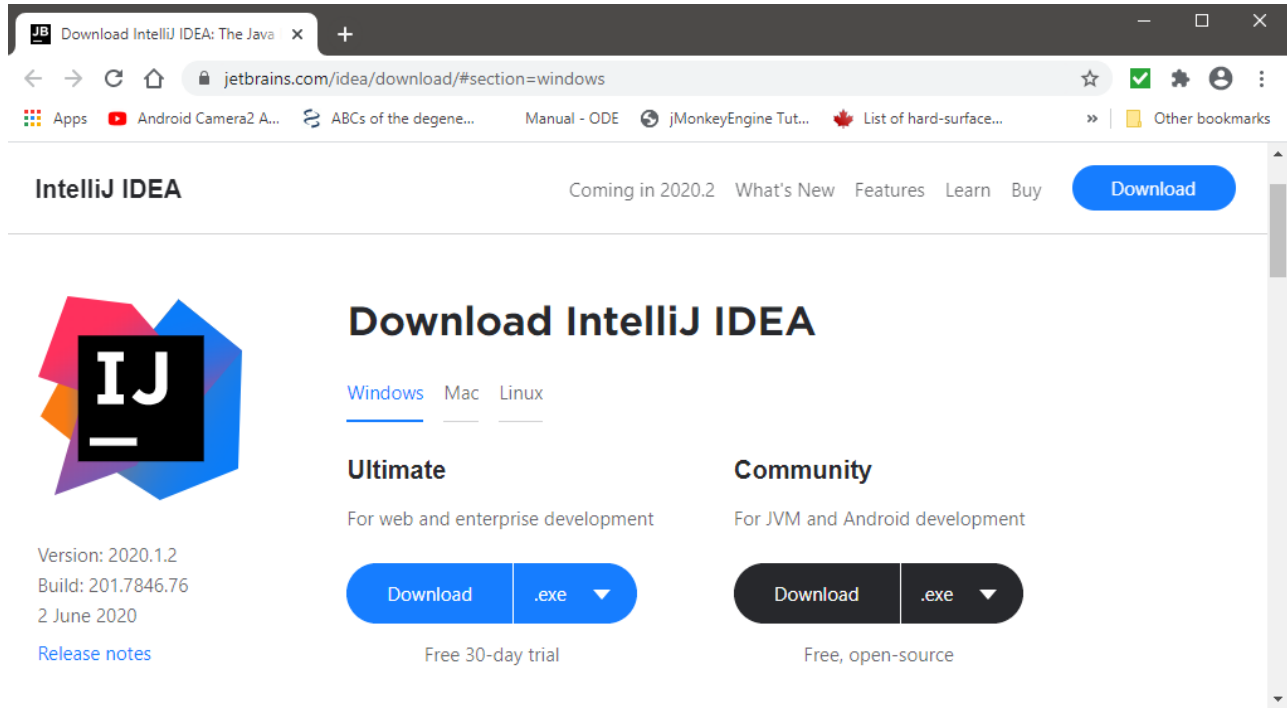
Double-click the downloaded .dmg file. This opens a window that provides icons to Install and to Uninstall Liberica. Double-click the icon to install Liberica JDK. This opens an installer wizard that you follow to complete the installation.

More detailed instructions are available here: [Liberica JDK 8u345+1 Install Guide | BellSoft Java \(bell-sw.com\)](#)

## II. If you don't already have IntelliJ IDEA on your system, you'll need to install it.

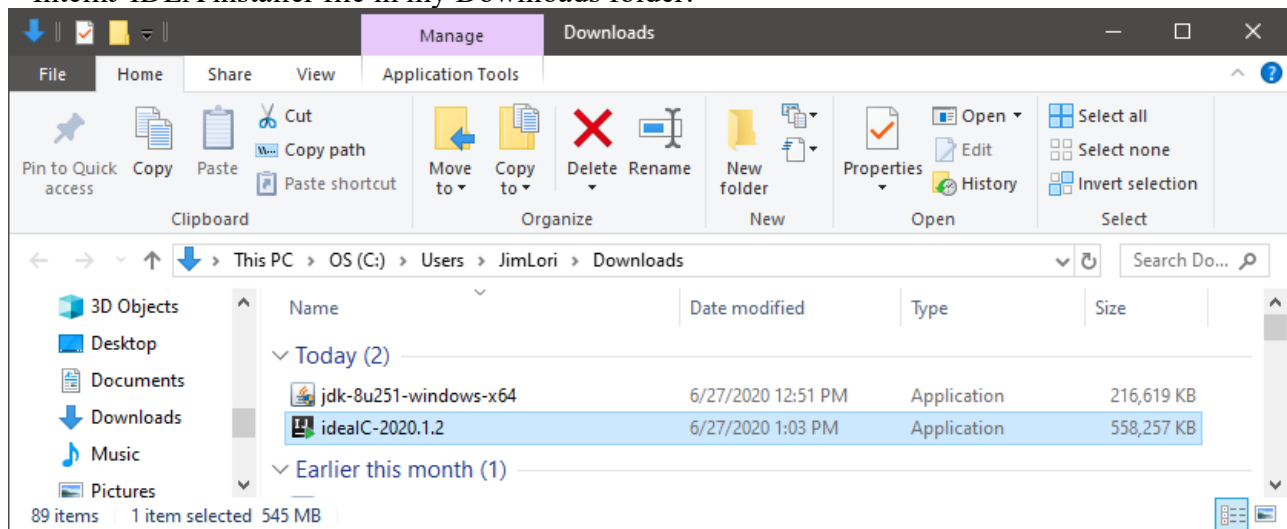
Open a browser and navigate to:

<https://www.jetbrains.com/idea/download/#section=windows>



Click to download the .exe for the free Community edition of IntelliJ IDEA. For example, this might be named idealC-2020.1.2.exe.

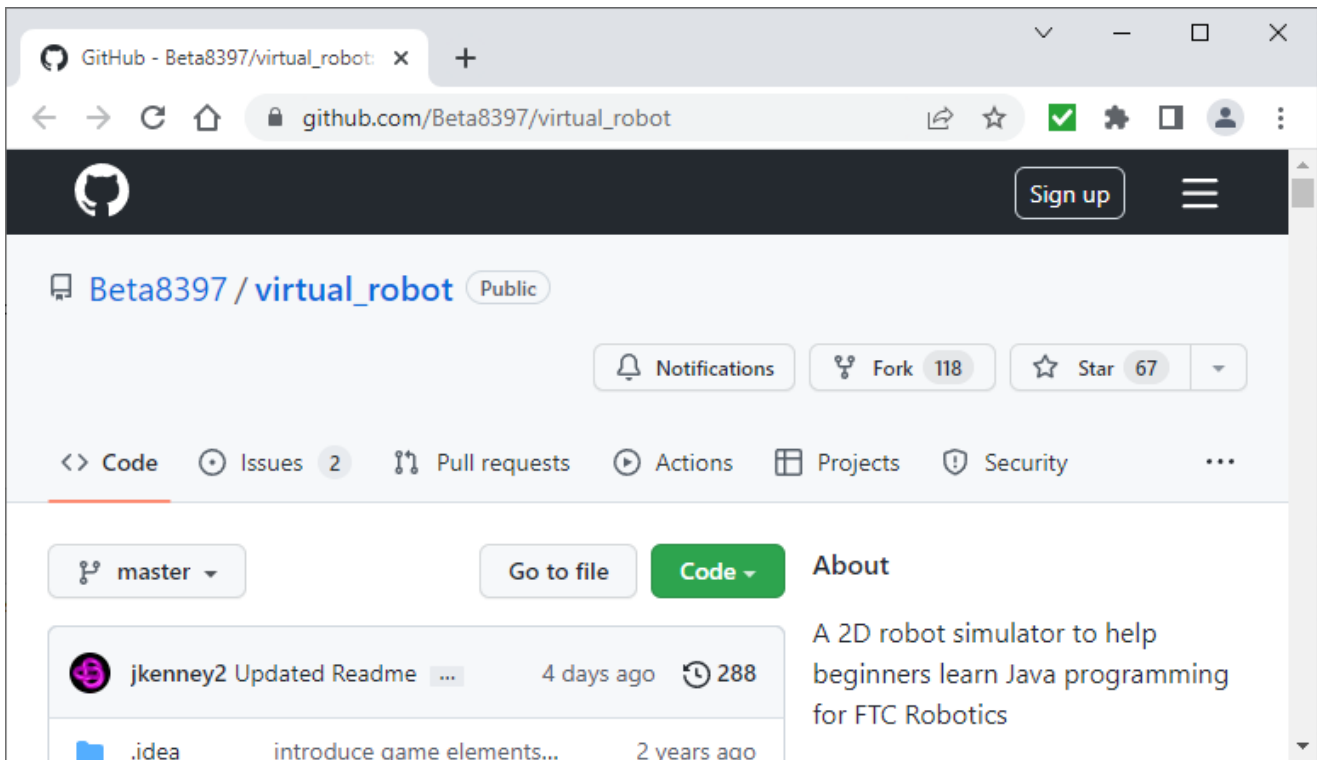
IntelliJ IDEA installer file in my Downloads folder:



Run this .exe file to install IntelliJ IDEA.

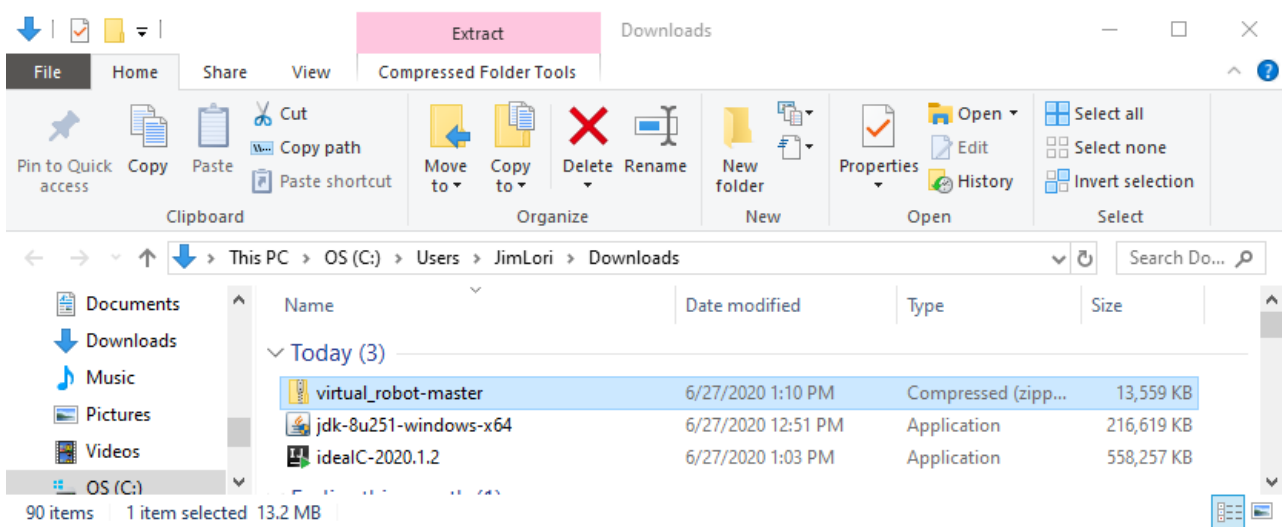
### III. Download the Virtual Robot application.

Open a browser and navigate to: [https://github.com/Beta8397/virtual\\_robot](https://github.com/Beta8397/virtual_robot)



Click the green button ("Code") on the right and select the "Download Zip" option. You'll find the .zip folder in your downloads directory: virtual\_robot-master.zip.

virtual\_robot-master.zip file in my Downloads folder:



Right-click the zip folder and select "Extract all...". Extract to the folder of your choice. You'll wind up with an unzipped folder, for example: C:\Users\Me\Downloads\virtual\_robot-master.

Within this folder, you should find a single directory: virtual\_robot-master. That is the project folder. So for example, the path to the project folder might be:

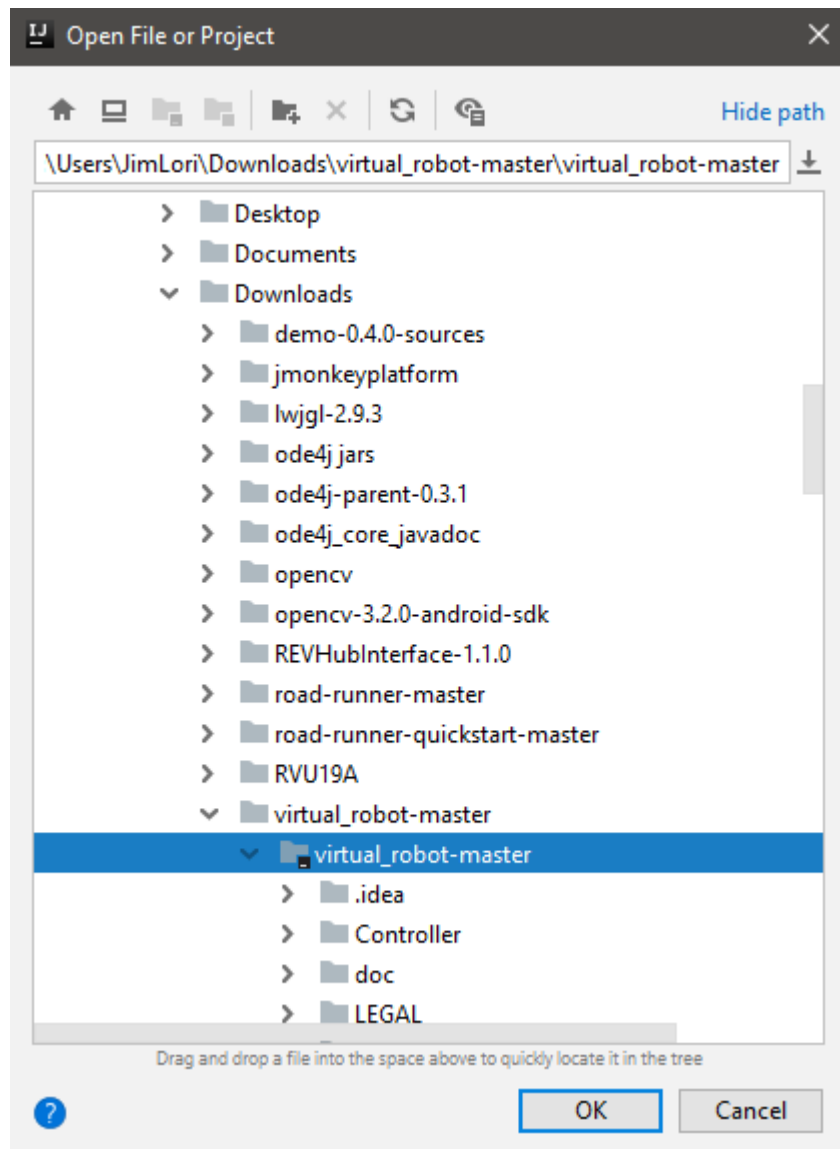
C:\Users\Me\Downloads\virtual\_robot-master\virtual\_robot-master

#### IV. Run the IntelliJ IDEA application.

If it is the first time you have run it, accept the defaults.



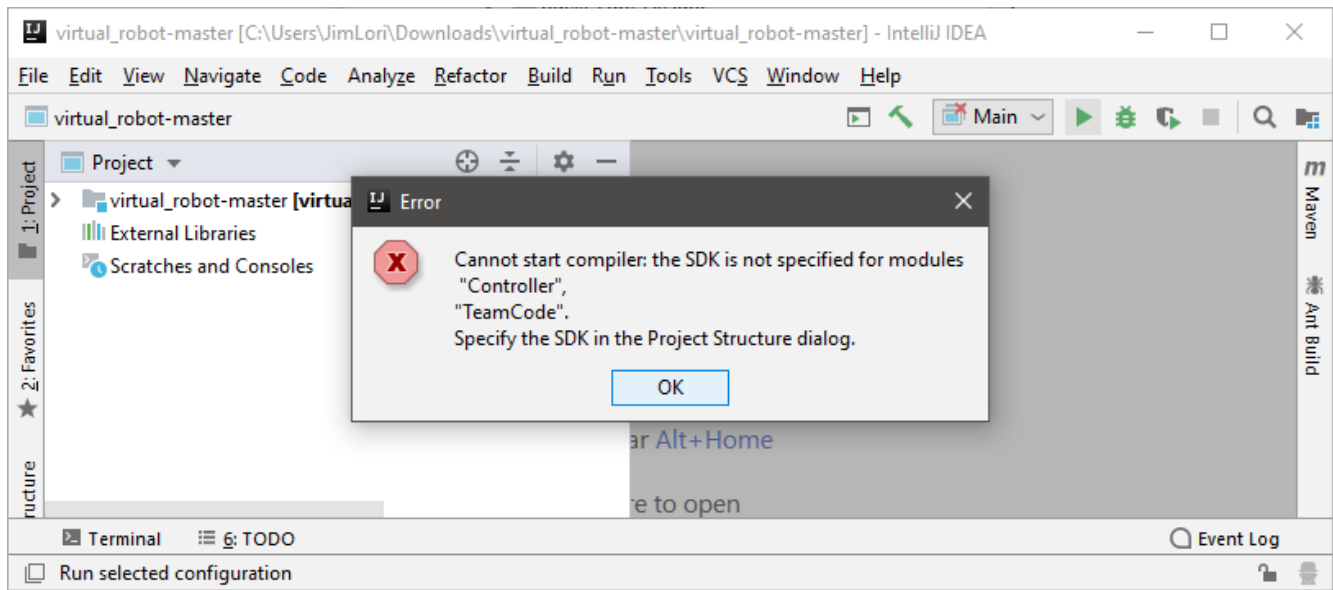
Click "Open", and navigate to your project folder, virtual\_robot-master. Note that if you have unzipped into a folder named virtual\_robot-master, then you will have another folder named virtual\_robot-master nested within it. The project folder is the inner one.



Click "OK", and the project will open.



**V. Click the green arrowhead to run the virtual\_robot app.**



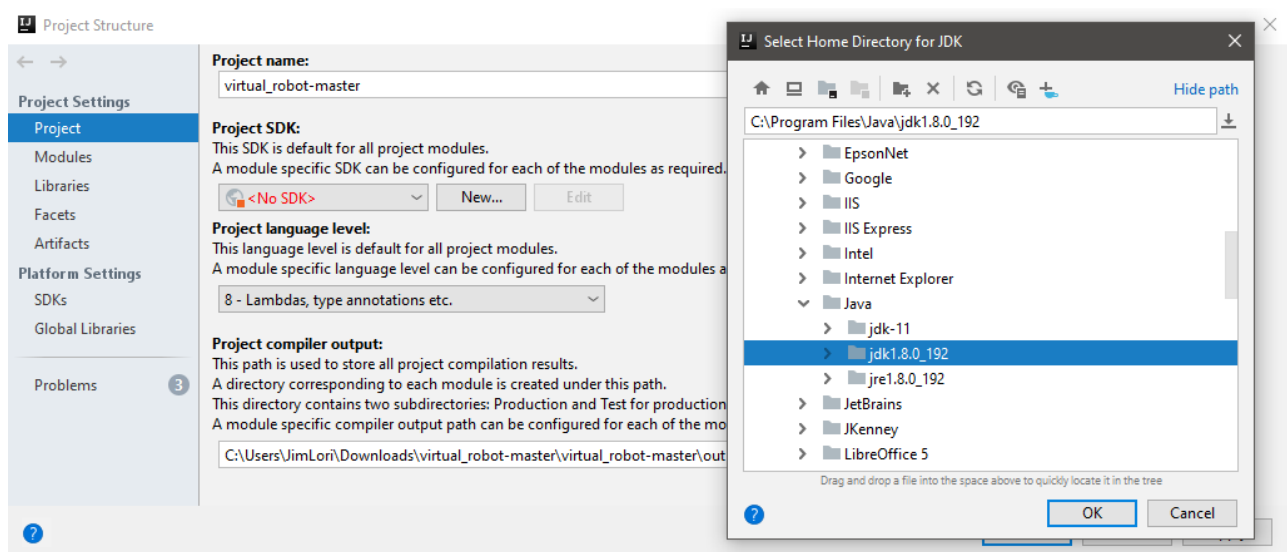
You may get an error that says you need to "specify the SDK" (meaning the JDK). If so, go to

File --> Project Structure

and select "Project".

Under "Project SDK" select "New...", then "JDK". This opens the "Select Home Directory for JDK" dialog. In this dialog, navigate to the location of your JDK8, for example

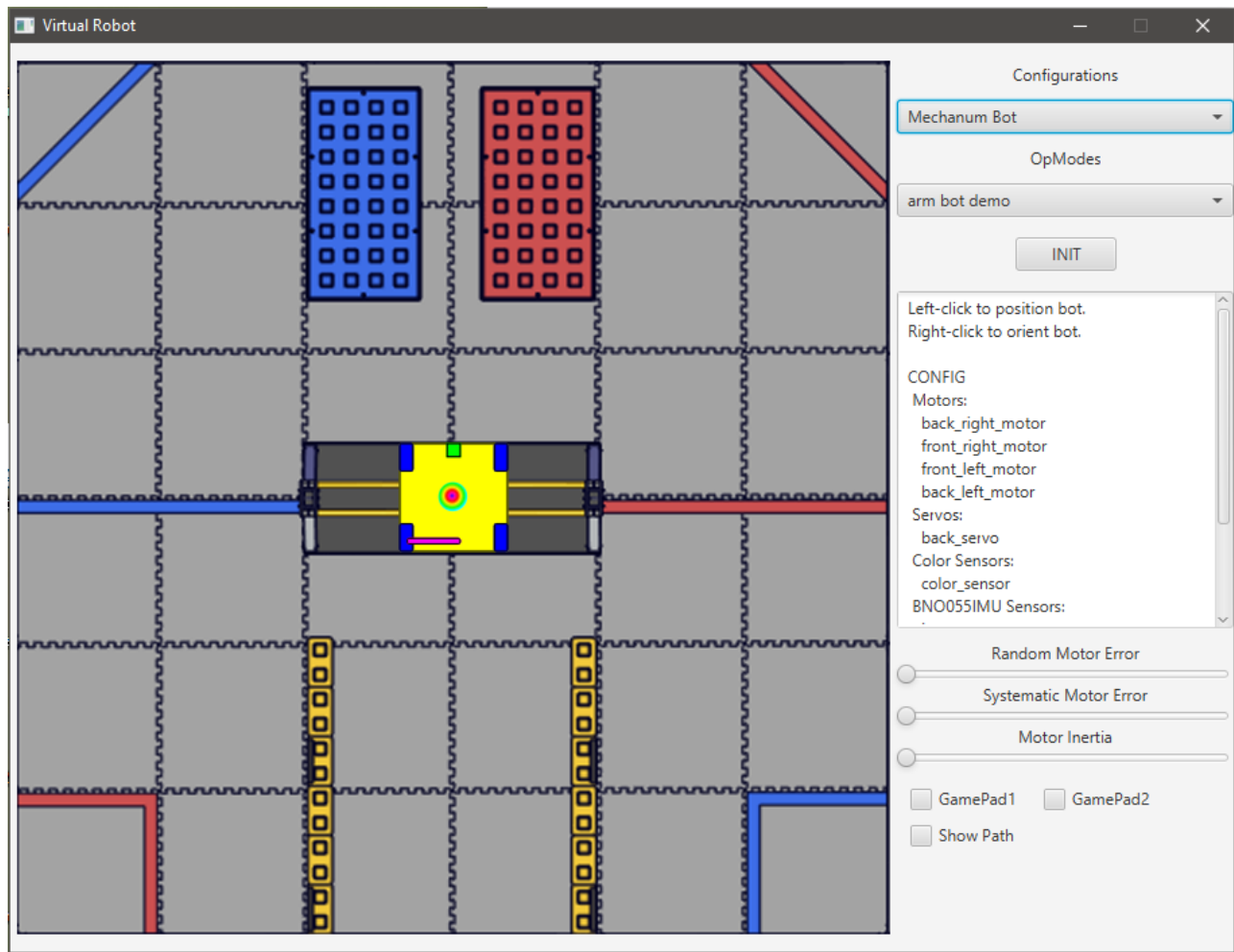
C:\Program Files\Java\jdk1.8.0\_192 (or , C:\Program Files\Amazon Corretto\jdk1.8.0\_265)



Select the appropriate directory and click OK.

Now, in the "Project Structure" dialog, click "Apply", then "OK".

Now you should be able run the app by clicking the green arrowhead.



**VI. Now you are ready to write and test your own op modes.**

**VII. NOTE: If you don't want to install IntelliJ, it is possible to use Android Studio instead.**

But, you won't be able to use the JDK that comes bundled with Android Studio. Instead, you'll have to download JDK8 from Oracle or Amazon Corretto (step I above).

Then download the virtual\_robot.zip and extract it as described in section III above.

Then open the virtual\_robot-master project in Android Studio (which is just like opening it in IntelliJ as described in section IV above).

Then set the JDK for the project using "File --> Project Structure", as described in section V above.

A video from FTC 16072 demonstrates this: <https://www.youtube.com/watch?v=pmaT9Twbmao>

It should now be possible to run the app by clicking the green arrowhead.

I have confirmed that this works, to the point of running the virtual\_robot app on Android Studio. I haven't tested to determine whether it works *as well* with Android Studio as it works with IntelliJ.

It's really not that hard to install and use IntelliJ, and you can use it for all kinds of other Java development and testing, too.