

EV3Dev Lessons

Introduction to EV3Dev:
Setup with Python



Objectives

- Learn how to install ev3dev on an EV3
 - Setup Visual Studio Code IDE
-
- **Prerequisites: none**

Materials

- EV3 brick
- USB Download Cable
- Micro SD card (between 2gb and 32gb, preferably class 8+)

What is ev3dev?

- ev3dev is a [Debian Linux](#)-based operating system that runs on the LEGO® MINDSTORMS EV3
- ev3dev allows you to program in different languages (eg. Python, C++)
- This will also cover installation of Python IDE (Integrated Development Environment)
 - *Note that an IDE is not required to write or run ev3dev or Python code on the EV3*
 - *While you can edit Python code in any editor, an IDE simplifies various aspects of developing and managing your code.*

Step 1: Download ev3dev

- Download the latest version of EV3dev for EV3:
<https://www.ev3dev.org/downloads/>
- Download ev3dev-stretch beta as that is what is needed for usage with the IDE
 - *For a detailed explanation of the differences between ev3dev-jessie and ev3dev-stretch, see the next slide*
- Remember where you downloaded the file

ev3dev-jessie vs. ev3dev-stretch

■ ev3dev-jessie:

- *Programs (and motors, sound, etc.) don't stop when you press the back button (unless you write your program in such a way that it does this, which is not exactly easy to do right)*
- *Doesn't work with VS Code extension*
- *Battery monitor does not automatically turn off the brick to prevent battery damage*

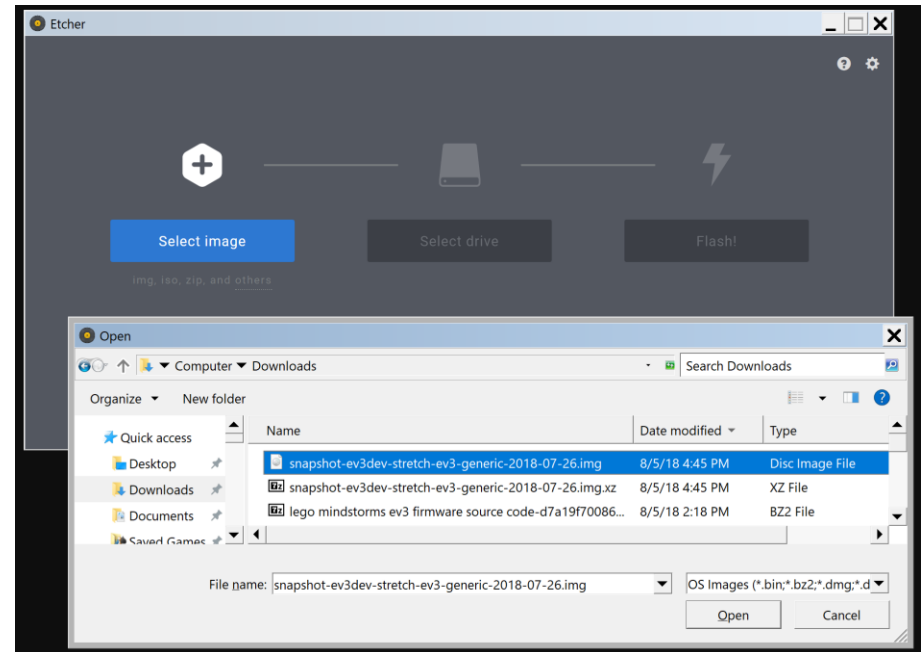
■ ev3dev-stretch:

- *Programs (and motors, sound, etc.) should stop when you press the back button.*
- *Does work with VS Code extension.*
- *Battery monitor automatically turns of brick when it reaches too low a voltage*
- *ev3dev2 python package is available, which is easier to use (e.g. it has move steering/move tank type functions)*

- Stretch is recommended for FIRST LEGO League teams because of the support for the IDE and the ev3dev2 library

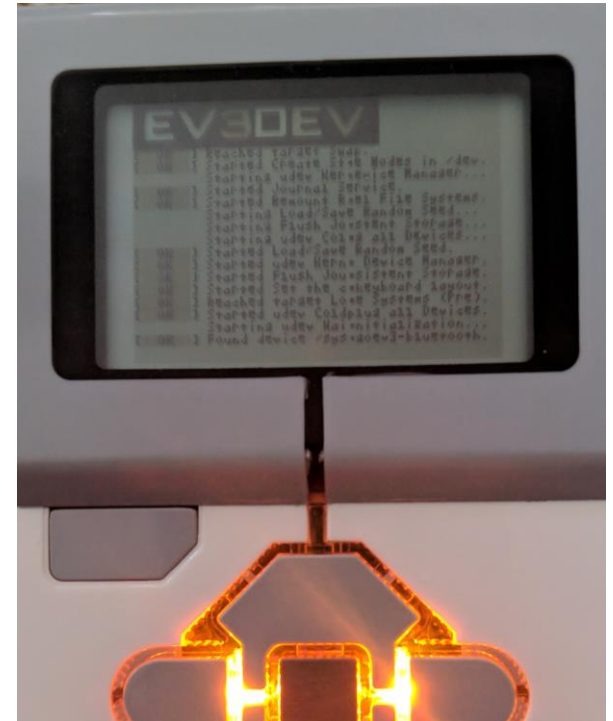
Step 2: Write Image (Windows, Mac, Linux)

- If you have a favorite tool writing images to SD cards – use that. Otherwise, we recommend that you download and install Etcher: <https://etcher.io/> for your OS
- Select the downloaded file for writing
- Insert the Micro SD card into the computer
- Write to your SD card (in device dropdown)



Step 3: Boot ev3dev

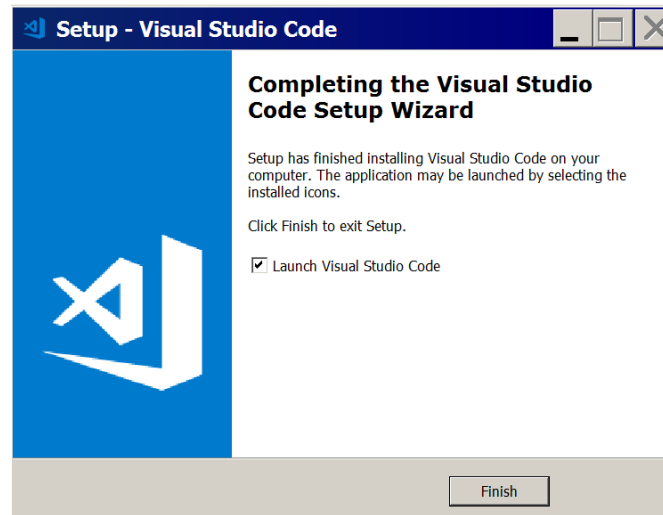
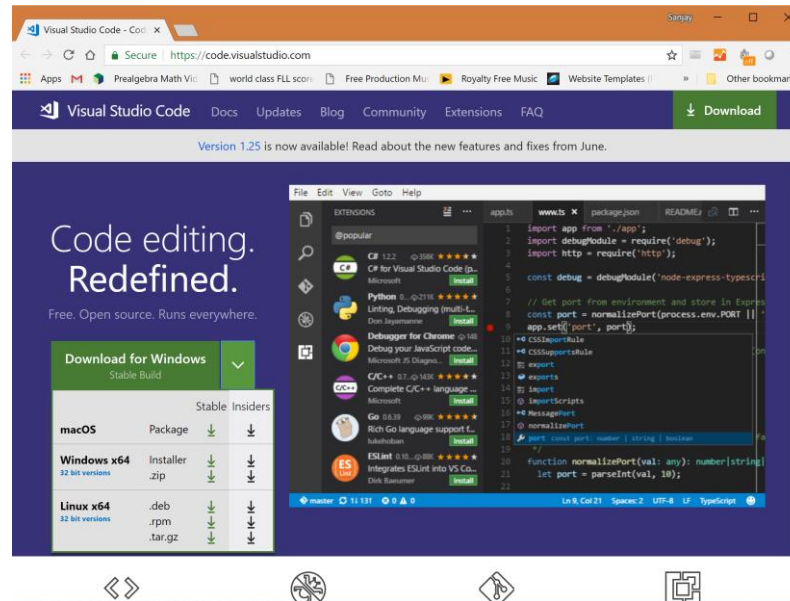
- Put the SD Card in your EV3 and power it on.
- At first, you will see the MINDSTORMS boot screen and the red LEDs will be on. This is immediately followed by the ev3dev boot screen and the LEDs changing to orange.
- The LED button lights on the EV3 brick will blink to indicate SD card activity.
- Tip: The SD card can be hard to pull out. Create a little tab out of tape. (Remove tape prior to an FLL tournament.)



Step 4: Install Visual Studio Code (VSC)

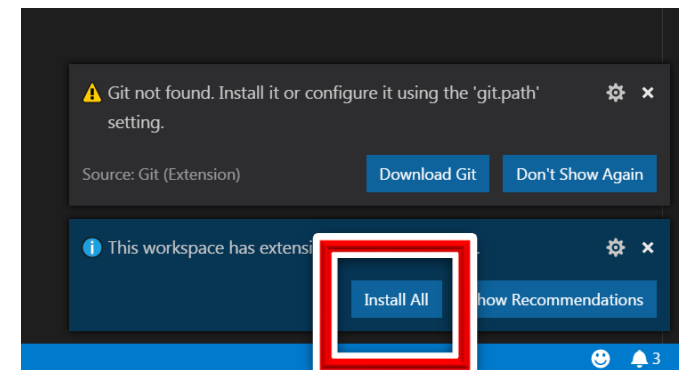
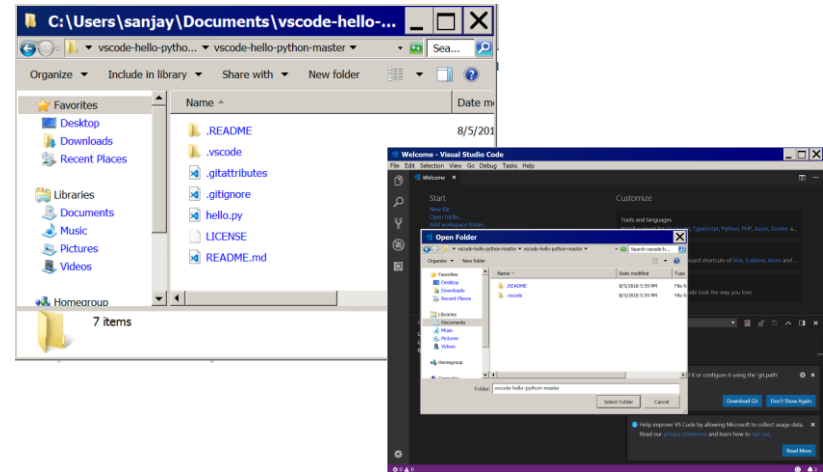
Download and install VSC from <https://code.visualstudio.com/> for Mac, Windows, or Linux.

This is the IDE that you can use to manage your programs.



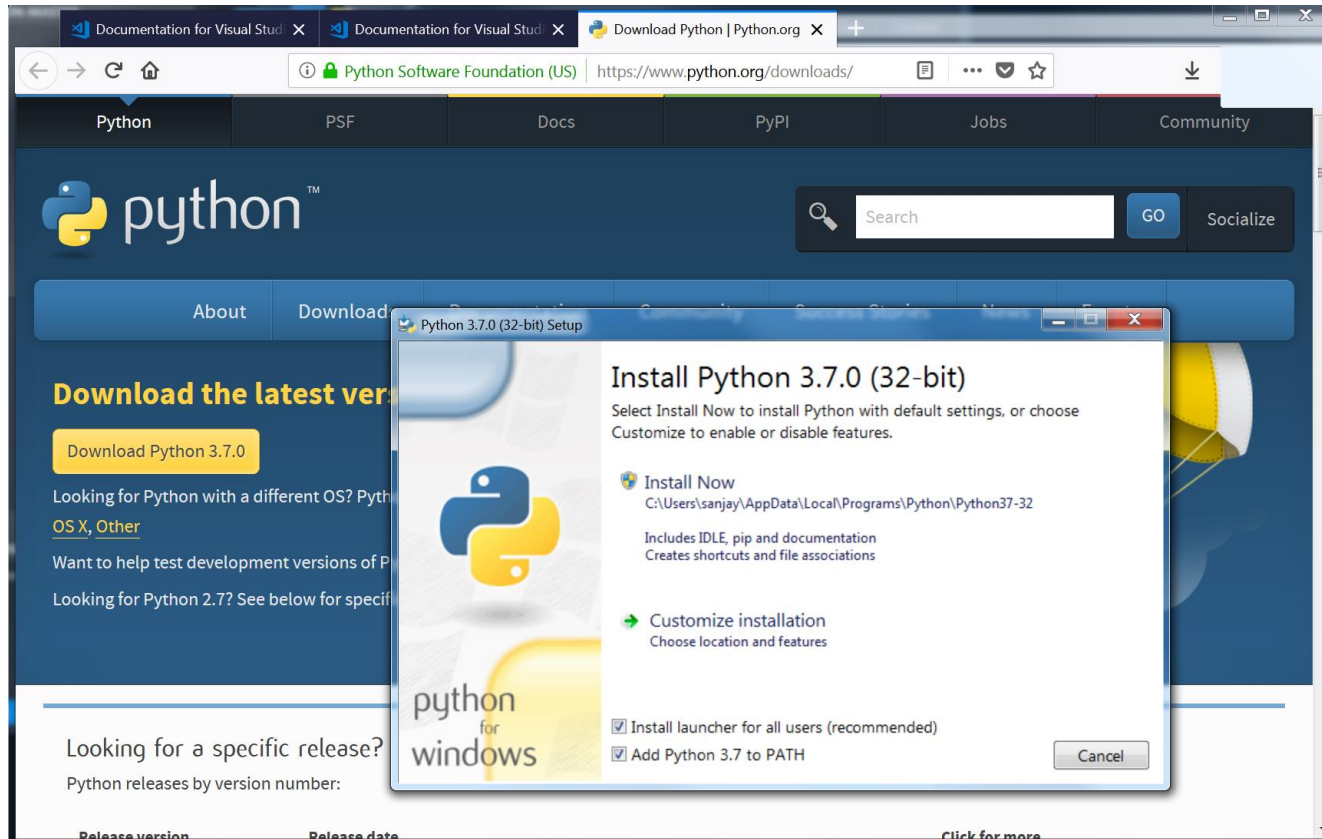
Step 5: Download Sample Project

- Download and extract the following zip file: <https://github.com/ev3dev/vscode-hello-python/archive/master.zip>
- Open the folder in VSC
- You will see an alert “This workspace has extension recommendations” → Press “Install All”. You might afterward be prompted to install pylint → click install
- Optional: If you want software versioning control, you can also install Git. VSC integrates with Git nicely.



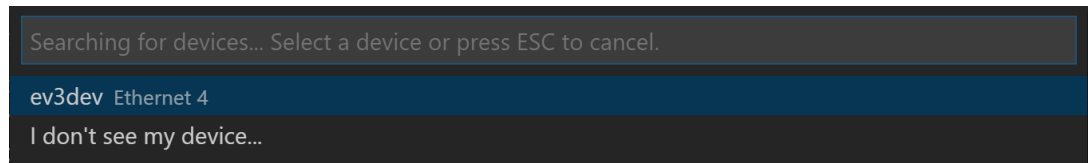
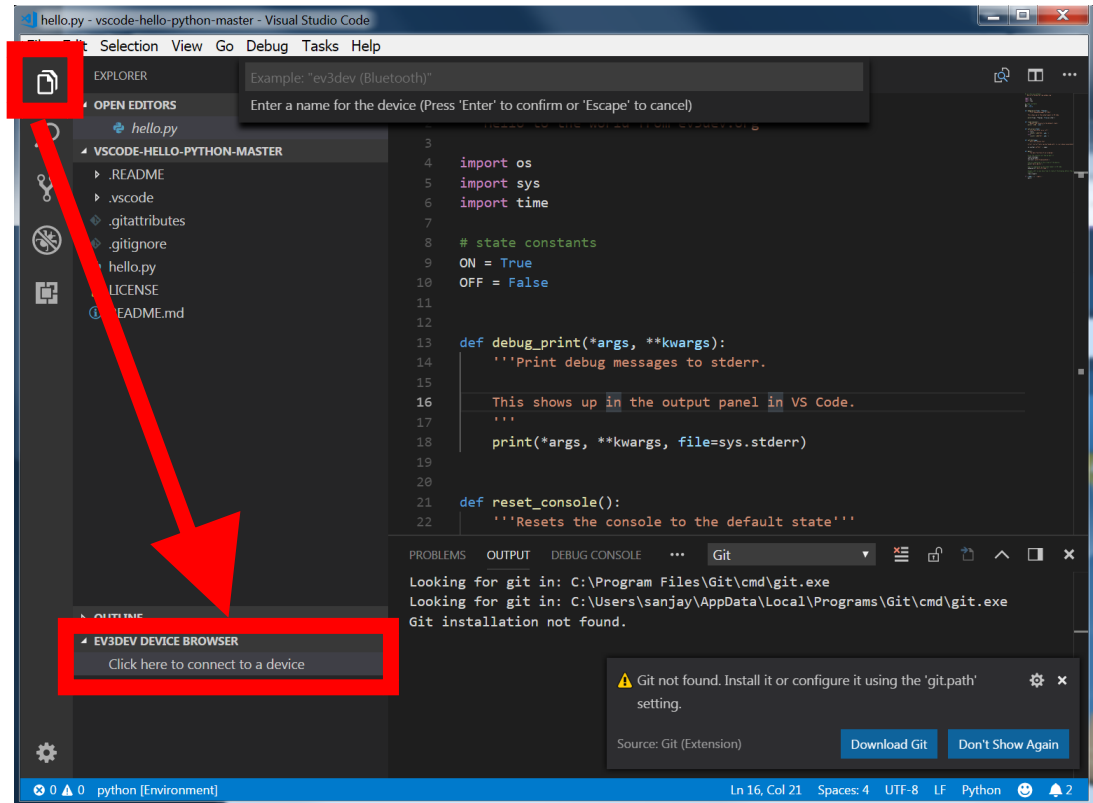
Step 6: Install python 3

- Download and install python3 from: <https://www.python.org/downloads/>
- You won't be running python on your desktop but the IDE setup needs this



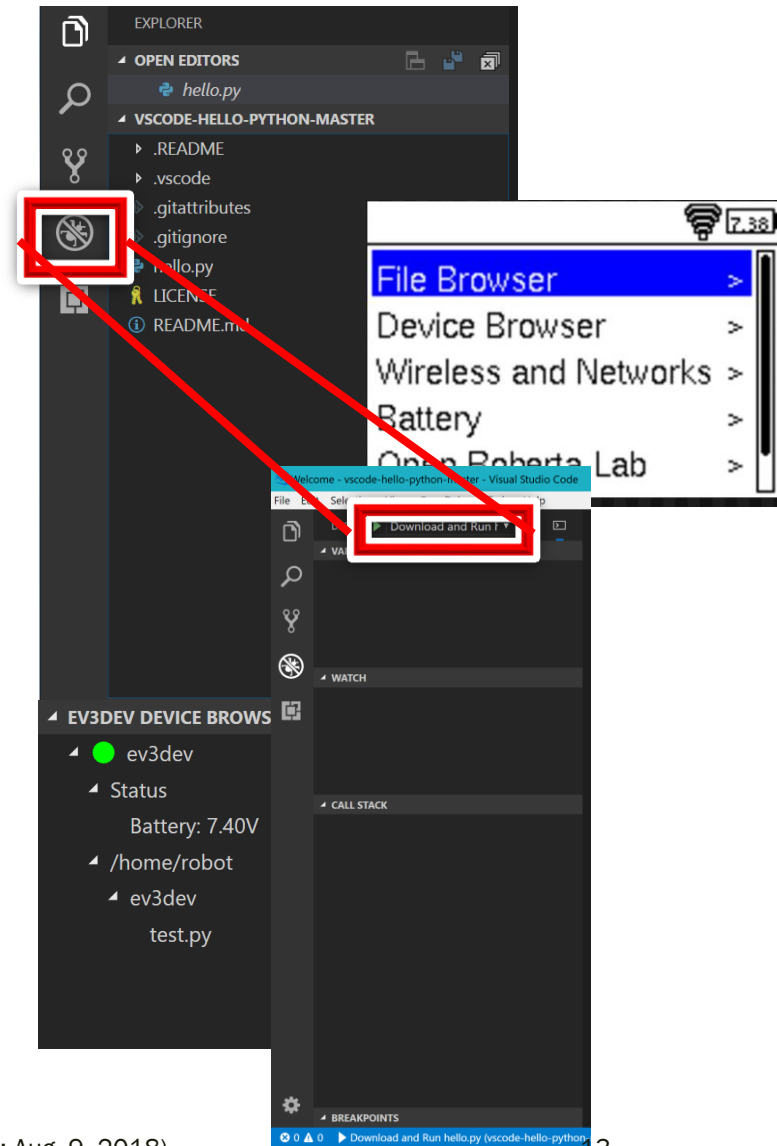
Step 7: Connect to EV3dev

- Click on File Browser
- Then click “Click here to connect to a device” under EV3dev Device Browser
- Plug in your EV3 via USB and you should be able to click on your brick in the new dialog
- Note: if you connect your EV3 using WiFi or Bluetooth, you can connect to the brick by choosing “I don’t see my device” and entering an IP address



Step 8: Running Code

- You can click on any file (or create a file) in the left pane to edit it in python
- To run a program, click the debugger icon on the left-hand pane and press download and run
- Programs can also be run directly on the brick under the “File Browser → ev3dev” on the robot’s Brick Manager



CREDITS

- This tutorial was created by Sanjay Seshan and Arvind Seshan from EV3Lessons
- More lessons are available at www.ev3lessons.com
- Credits: David Lechner, ev3dev.org, for the valuable feedback and information used in the [ev3dev-jessie vs stretch slide](#)



This work is licensed under a [Creative Commons Attribution-NonCommercial-ShareAlike 4.0 International License](https://creativecommons.org/licenses/by-nc-sa/4.0/).