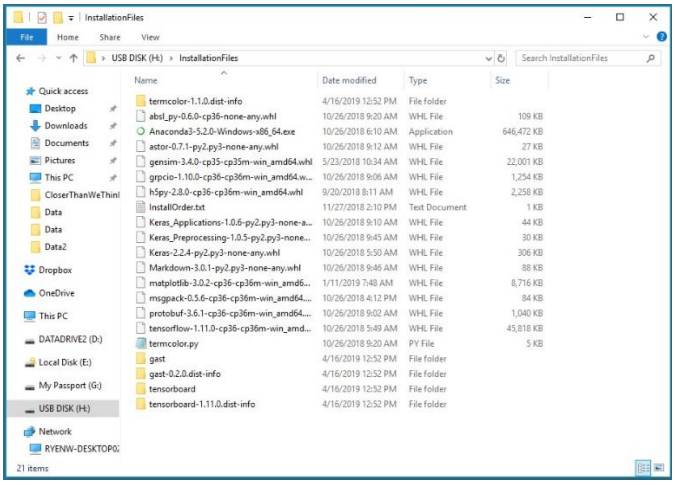
Installation Instructions for Keras and TensorFlow - Deep Learning World 2019

Installing machine learning software is very tricky but is a critically important skill. The first part of the workshop will walk you through the complex installation process using these instructions, but if you want to verify that you can install the needed software before the workshop, follow these instructions *exactly*.

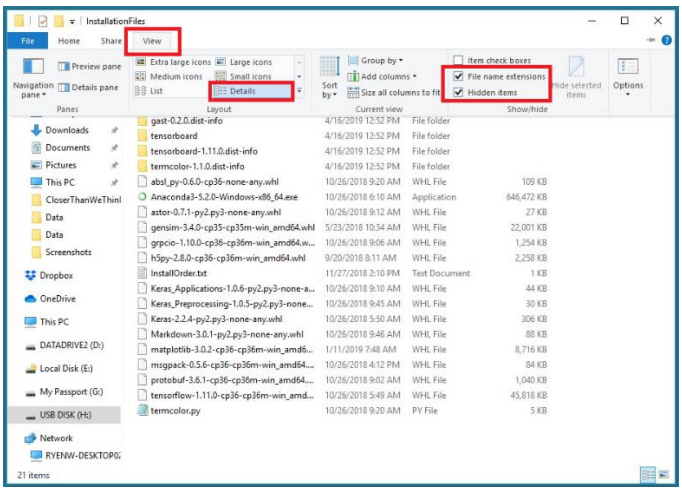
Prerequisites. Critical: You must have a machine running Windows 10, you must have Administrator privileges, and you must have access to a USB port on your machine.

Overview. These instructions show you how to install 1.) Anaconda3 5.2.0 which contains Python 3.6.5, 2.) TensorFlow 1.11.0, 3.) Keras 2.2.4, and 4.) the Python demo programs for the workshop. The installation is offline -- no Internet connection. Installation takes about 90 minutes. The software needed for installation will be given to you on a USB drive. The files can also be found in .zip format at http://www.quaetrix.com/DLW2019/

1. Critical: Log on to your machine as a user with Administrator privileges. Insert the USB drive you received from the Lab Assistant.

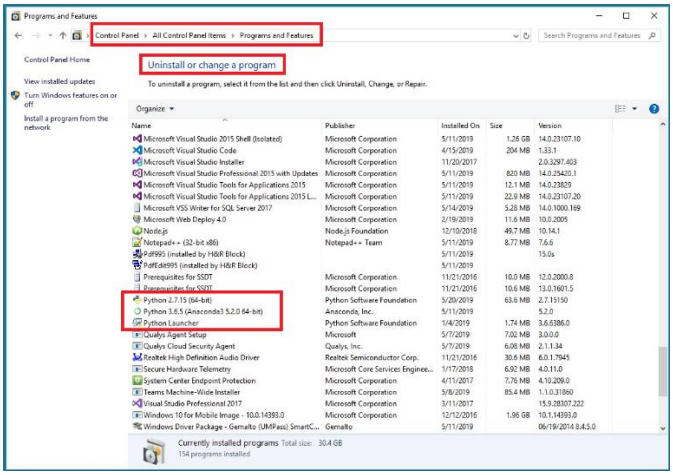


2. Critical: Make sure you can see hidden files and file extensions:

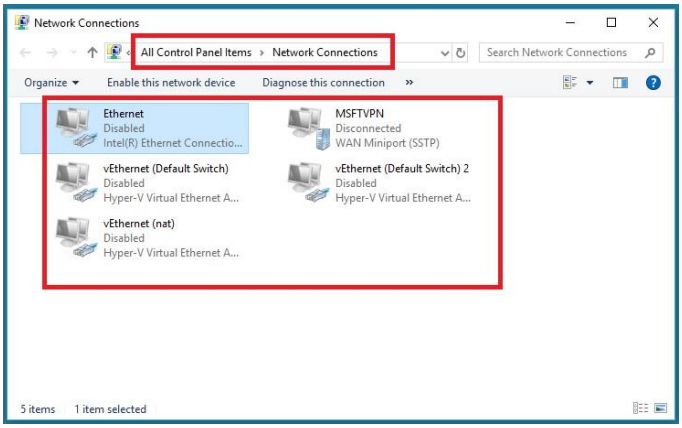


3. Copy the entire InstallationFiles directory and its contents to a convenient location on your local machine. Recommended is create C:\Keras and copy there. Critical: Remove the USB drive.

4. Critical: Delete all existing Python, Keras, and TensorFlow installations on your machine.



5. Critical: Disconnect your machine from all networks, including wireless networks. If you're connected to the Internet, failure is pretty much assured because you will get incorrect versions of dozens of files.



6. Install Anaconda3 5.2.0 (which contains Python 3.6.5)

a.) Open a File Explorer window, navigate to the InstallationFiles directory, and double-click on file Anaconda3-5.2.0-Windows-x86_64.exe to start the install.

b.) Read the Welcome screen, click Next. On the License Agreement, click I Agree.

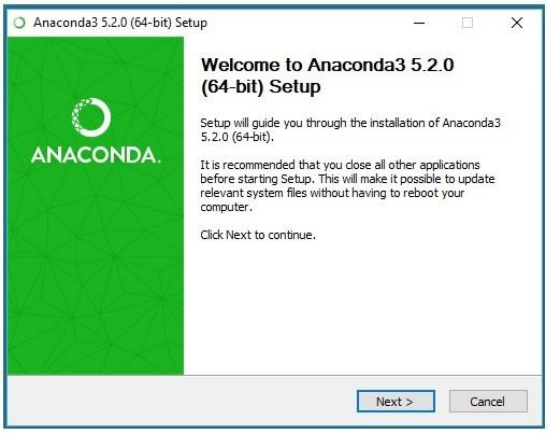
c.) On the Select Installation Type, accept the default "Just Me" option, click Next.

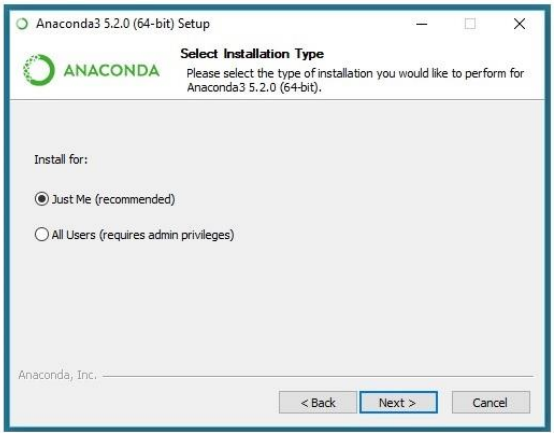
d.) On the Choose Install Location screen, accept the default of C:\Users\<name>\AppData\Local\Continuum\anaconda3 and Critical: write this path down. Click Next.

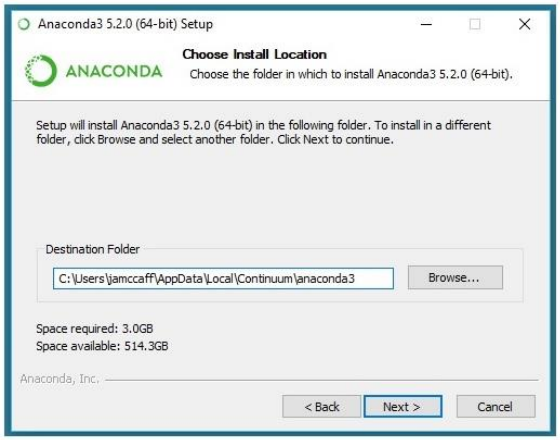
e.) Critical: On the Advanced Installation Options screen, check the "Add Anaconda to my PATH environment variable" option. Ignore "not recommended" message. Click Next. Install takes 20 minutes.

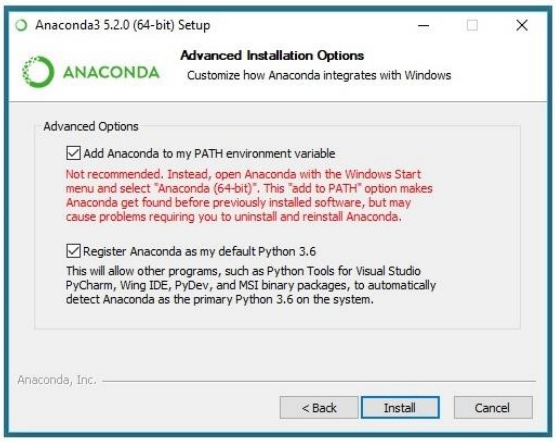
f.) On the Microsoft Visual Studio Code screen, do not click "Install Microsoft VSCode" button. Instead, click the Skip button.

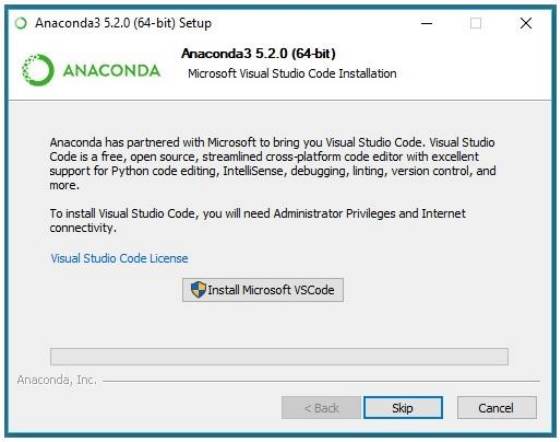
g.) On the Thanks screen, uncheck the two "Learn" options, click Finish.



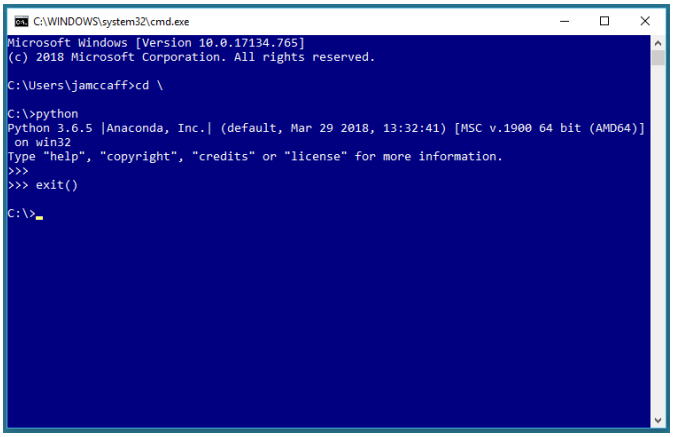






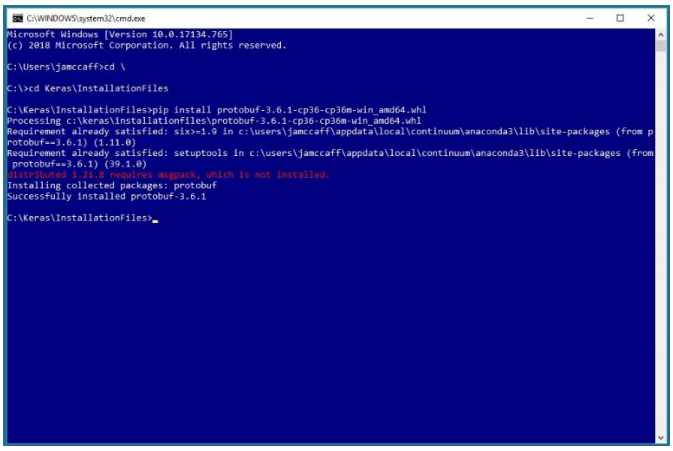


7. Test Anaconda - Left-click the Windows icon in lower-left screen, immediately type "cmd" then click on the Command Prompt option to launch a shell. Type `> cd \` <enter> to go to root, then type `> python` <enter> to launch the Python interpreter. You should see the Python >>> prompt. Type `>>> exit()` <enter> to exit the interpreter.



8. Install TensorFlow. Stop immediately if something goes wrong and alert the Lab Assistant.

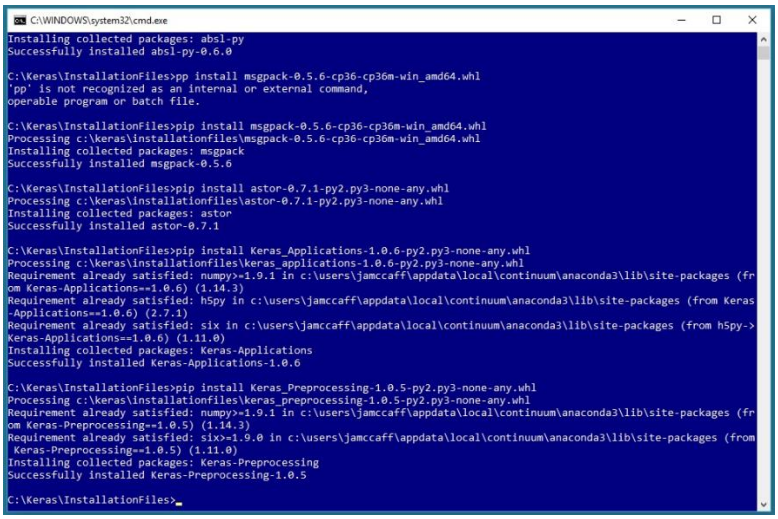
a.) Open a File Explorer and navigate to the InstallationFiles directory so you can see the files. Launch a command shell, type `cd \` <enter> and then `cd Keras\InstallationFiles` <enter>. Install the protobuf package by typing `> pip install pro`*`(tab)`* and then <enter>. The (tab) is autocompletion.



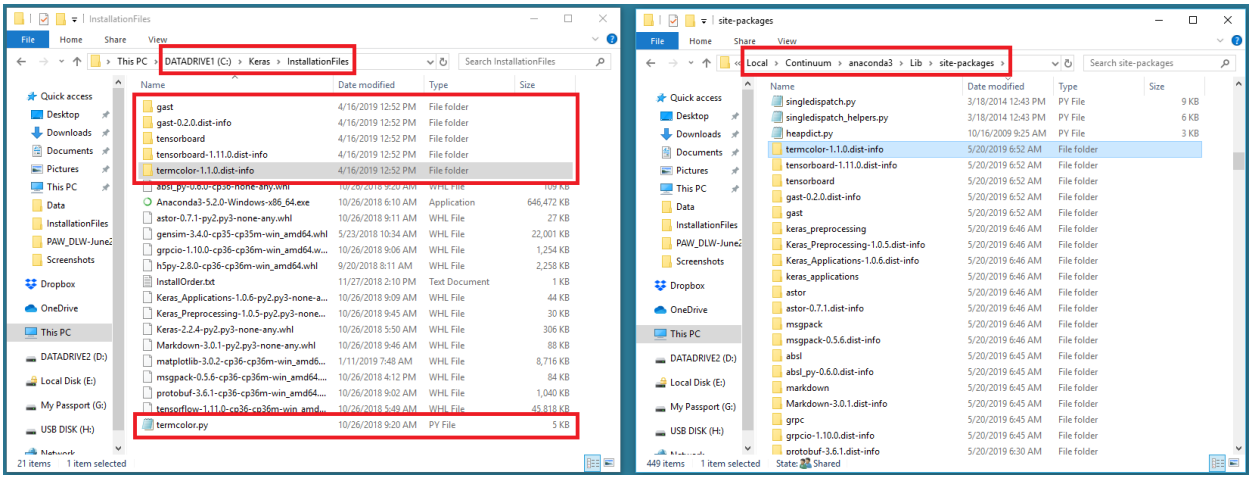
b.) Repeat the pip install process for the following 7 packages. Use tab-completion!

```
> pip install grpcio-1.10.0-cp36-cp36m-win_amd64.whl

> pip install Markdown-3.0.1-py2.py3-none-any.whl

> pip install absl_py-0.6.0-cp36-none-any.whl

> pip install msgpack-0.5.6-cp36-cp36m-win_amd64.whl

> pip install astor-0.7.1-py2.py3-none-any.whl

> pip install Keras_Applications-1.0.6-py2.py3-none-any.whl

> pip install Keras_Preprocessing-1.0.5-py2.py3-none-any.whl
```

The instructor will explain exactly what is going on here.



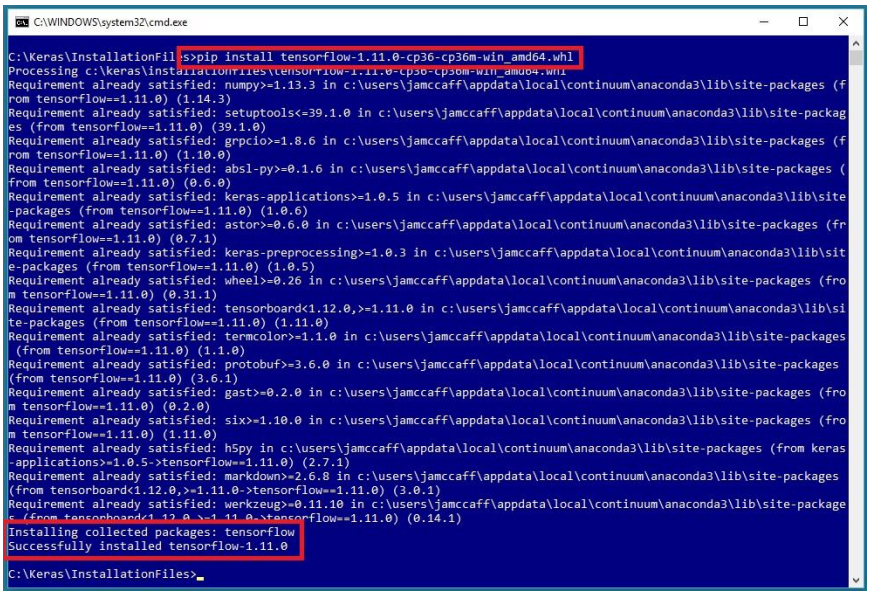
c.) Note: More mistakes are made on the following step than any other step. Three TensorFlow packages require pre-built files. Open one File Explorer and go to C:\Keras\InstallationFiles. Open a second File Explorer and go to the installation location you wrote down in step 6d. Then navigate to Lib\site-packages. Copy (do not move) the 6 folders and the single file named termcolor.py from InstallationFiles to site-packages. To copy, right-click and drag. The context will say "Move to" but as soon as you release the right button you will get an option to "Copy here".



d.) Launch a cmd shell, navigate to C:\Keras\InstallationFiles and enter the command:

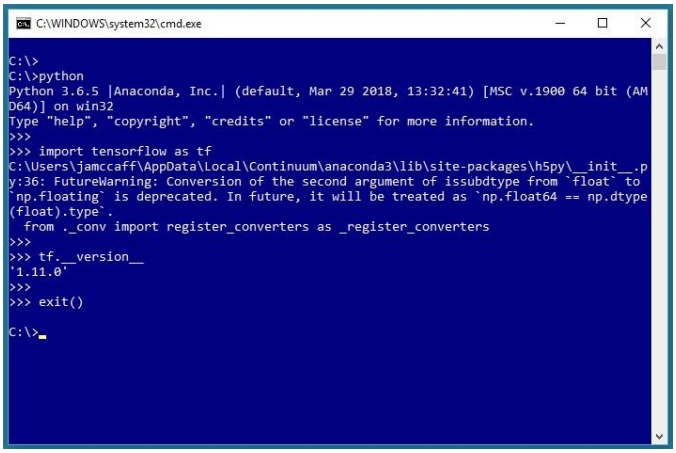
```
> pip install tensorflow-1.11.0-cp36-cp36m-win_amd64.whl
```

Note: Steps 8a. through 8c. prepared an offline installation of Keras in step 8d. If you were connected to the Internet, you could, in theory, skip 8a. through 8c. and go directly to 8d. However, there are over 500 package dependencies involved and installing over an online connection will automatically, without giving you an option to cancel, install the latest available packages, which inevitably creates Python "package hell".



e.) Test TensorFlow. Launch a cmd shell and enter the commands (note: two double underscores):

```
> python
>>> import tensorflow as tf
>>> tf.__version__
>>> exit()
```



Notice the warning. Getting scary-looking warnings is part of the Python ecosystem. To eliminate this warning, and also to eliminate another warning later, launch a shell, go to C:\Keras\InstallationFiles and enter the commands:

```
> pip install h5py-2.8.0-cp36-cp36m-win_amd64.whl
> pip install matplotlib-3.0.2-cp36-cp36m-win_amd64.whl
```

After installing these two packages, try testing TensorFlow again. When working with deep learning, you'll be using Python. Python versioning errors are a continuous nightmare but the ability to solve them is a critically important skill and one that you'll get used to with practice.

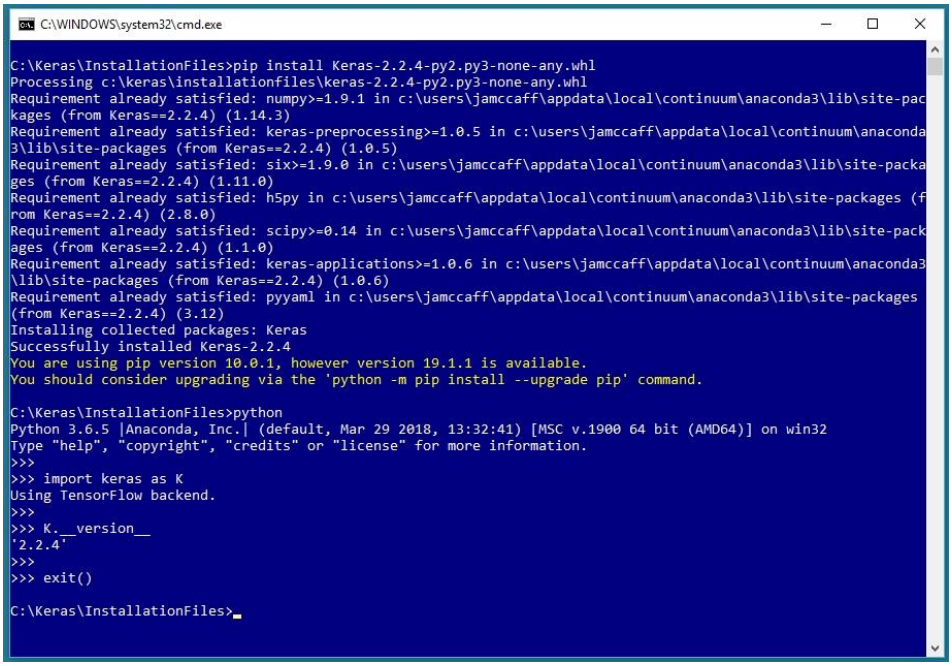
9. Install and test Keras. Note: The latest versions of TensorFlow include an embedded version of Keras. However, installing Keras separately gives you more flexibility and is generally considered the more professional approach.

a.) Launch a cmd shell and navigate to C:\Keras\InstallationFiles and issue the command:

```
> pip install Keras-2.2.4-py2.py3-none-any.whl
```

b.) Enter the commands (two double underscores):

```
> python

>>> import keras as K

>>> K.__version__

>>> exit()
```



Congratulations! You have just joined a very select club of professional data science insiders who can explore serious deep learning without relying on amateur-level tools or systems or artificial Cloud-based environments.

Note: You can now safely re-connect to the Internet.