Introduction to Programming with Python
Course: CSCI E-7

Anaconda Install, Conda Env Set up
&
Running Jupyter Notebook

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Extension School

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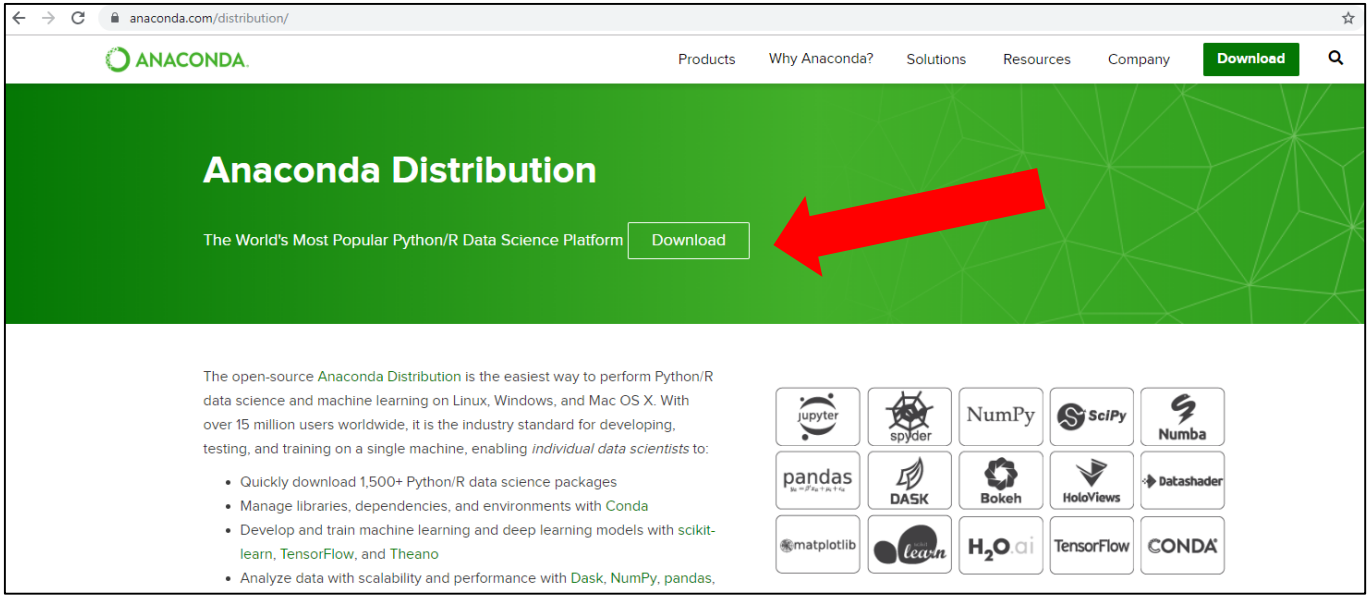
Purpose

- This is an Anaconda installation step-by-step for Windows install on 64-bit p.c.

- The download and install is similar for macOS and Linux.

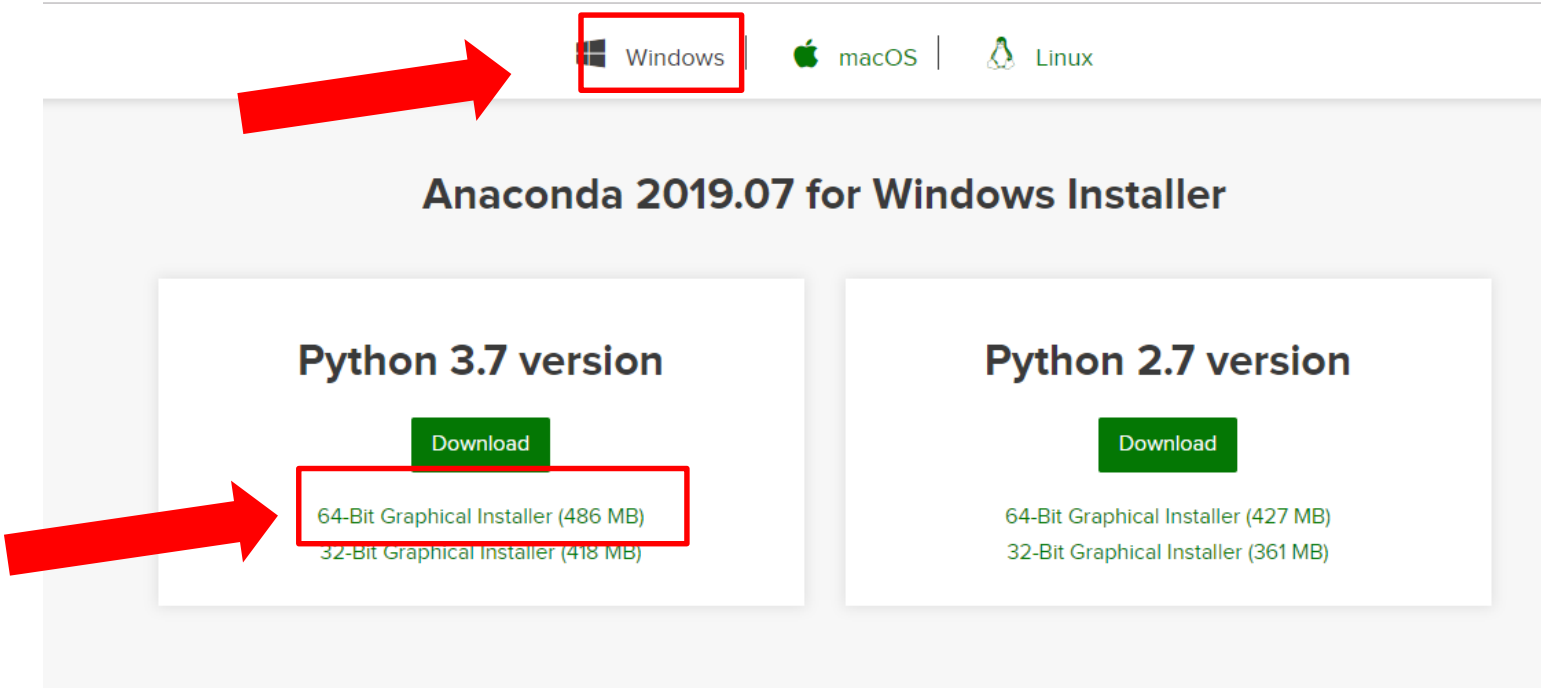
Where can you get Anaconda?

- Go to https://www.anaconda.com/distribution/
- Select Download



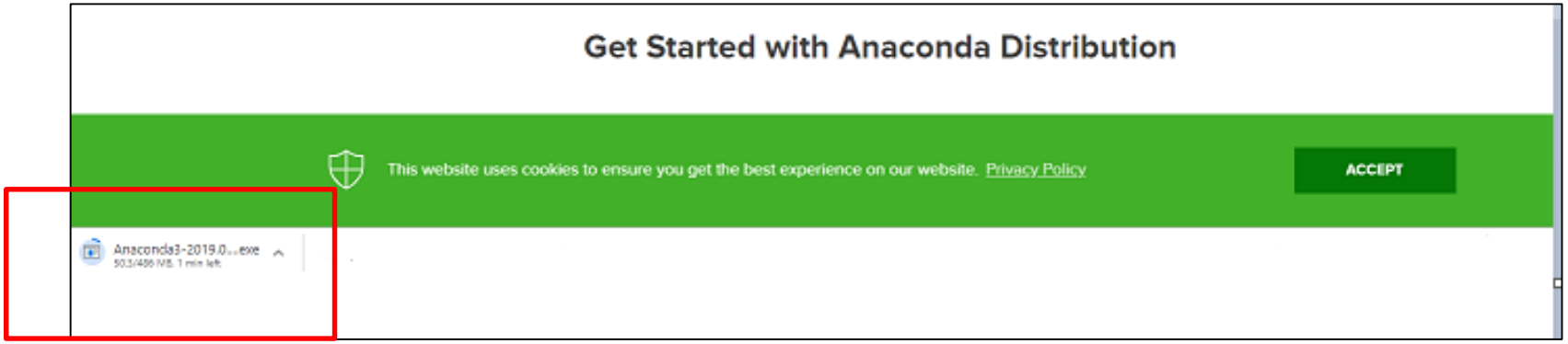
Start your Anaconda Download

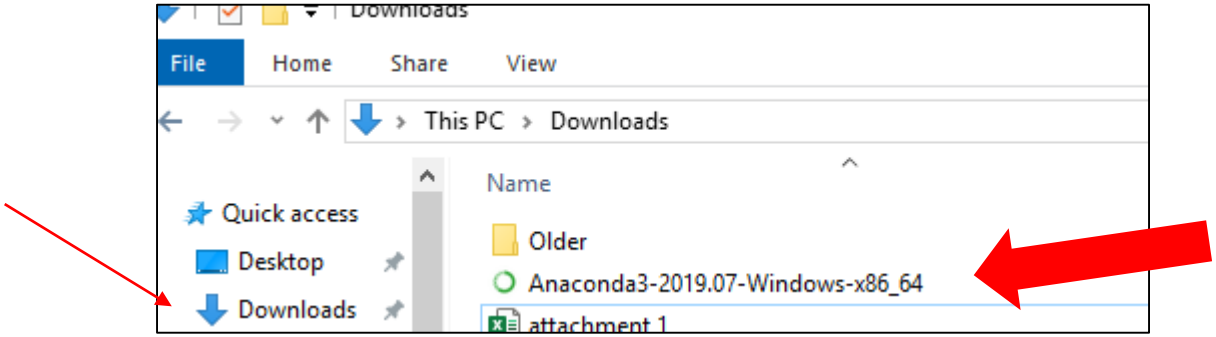
- Select your operating system (Windows, macOS, Linux)
- Select Python 3.7 version with 64-bit installer if you have a 64-bit machine.



Anaconda File Download - continued

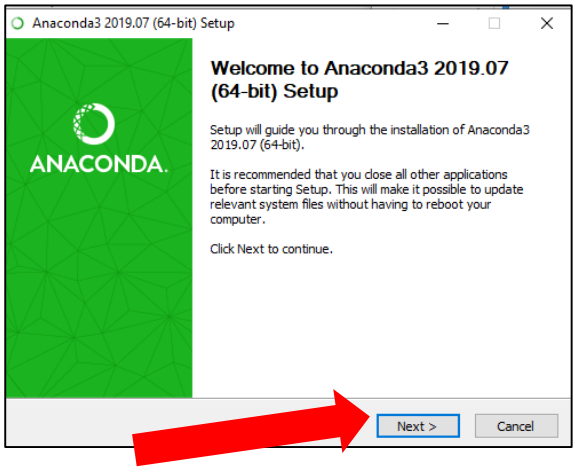
Once you select download you will see the following appear in your browser, bottom left. This is your Anaconda executable file and it will download to your **Downloads** folder.

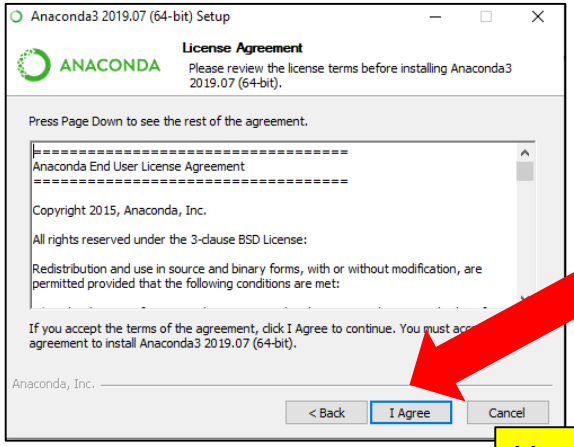


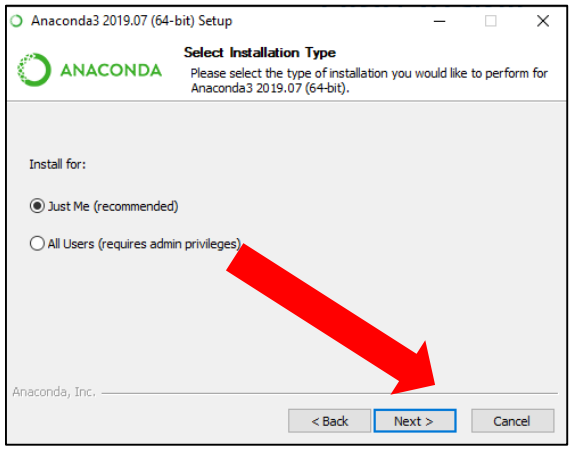


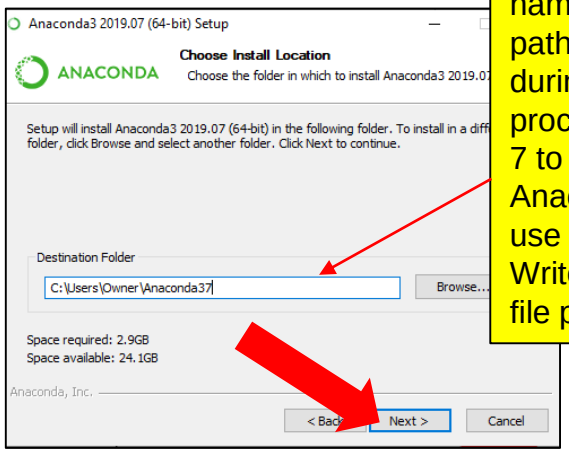
Start Install

- Select the file you downloaded – and click twice. You will see the following screen and then select Next and I agree on the following screen. See below and follow selections.





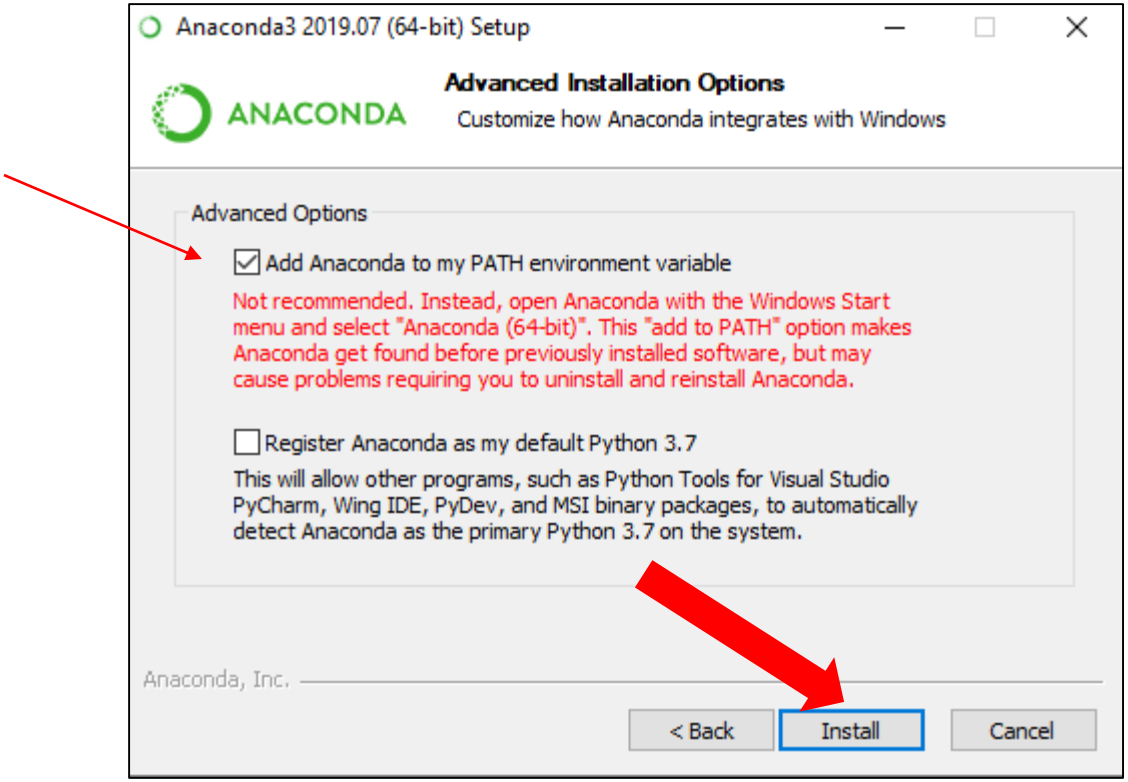




Your folder name will be here. This path is created during the install process. I added a 7 to the filename: Anaconda37. Generally use the default file path. Write down this file path and save it!

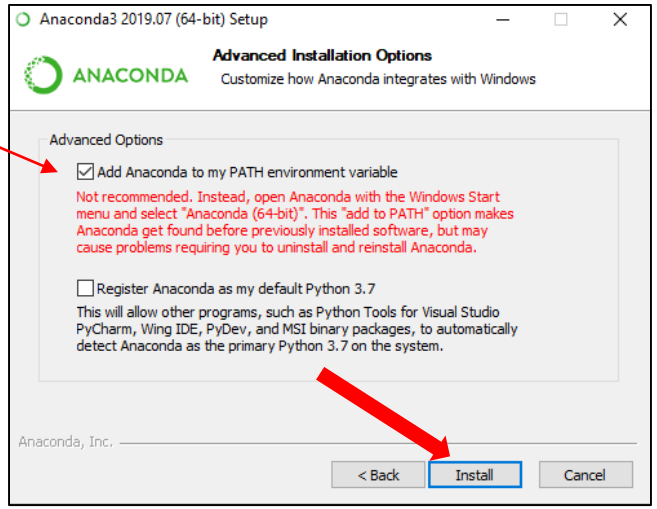
Install - continued

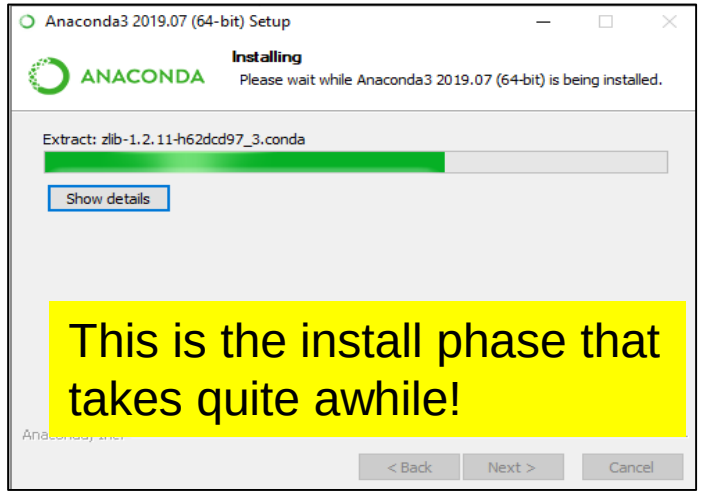
- Select: Add Anaconda to my PATH environment variable. .

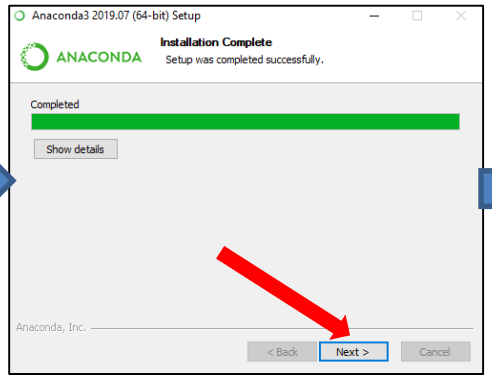


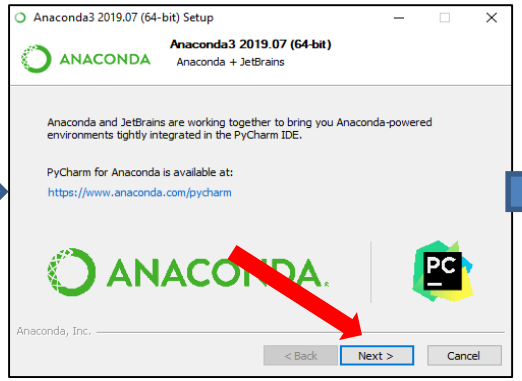
Install - continued

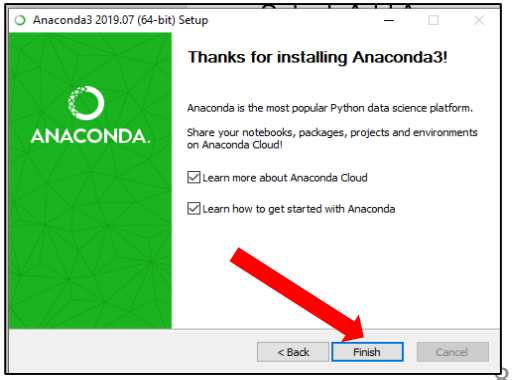
- Select: Add Anaconda to my PATH environment variable. Now wait for the install. This will take quite a long time…





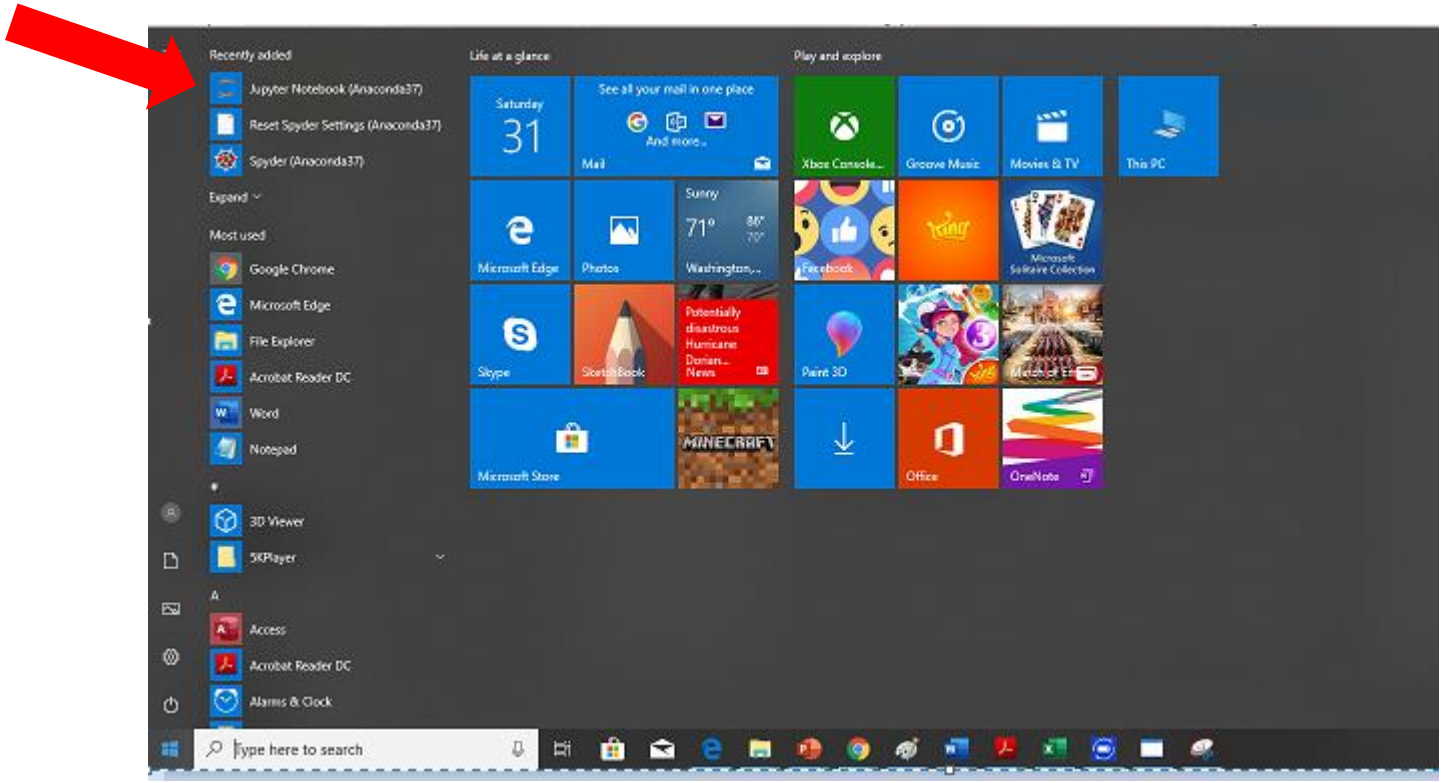






Check for your Anaconda App

- Check your Windows list of applications (bottom left) and you will see Jupyter Notebook 37 at the top of the column since you just installed it.
- Select Jupyter Notebook (Anaconda37).

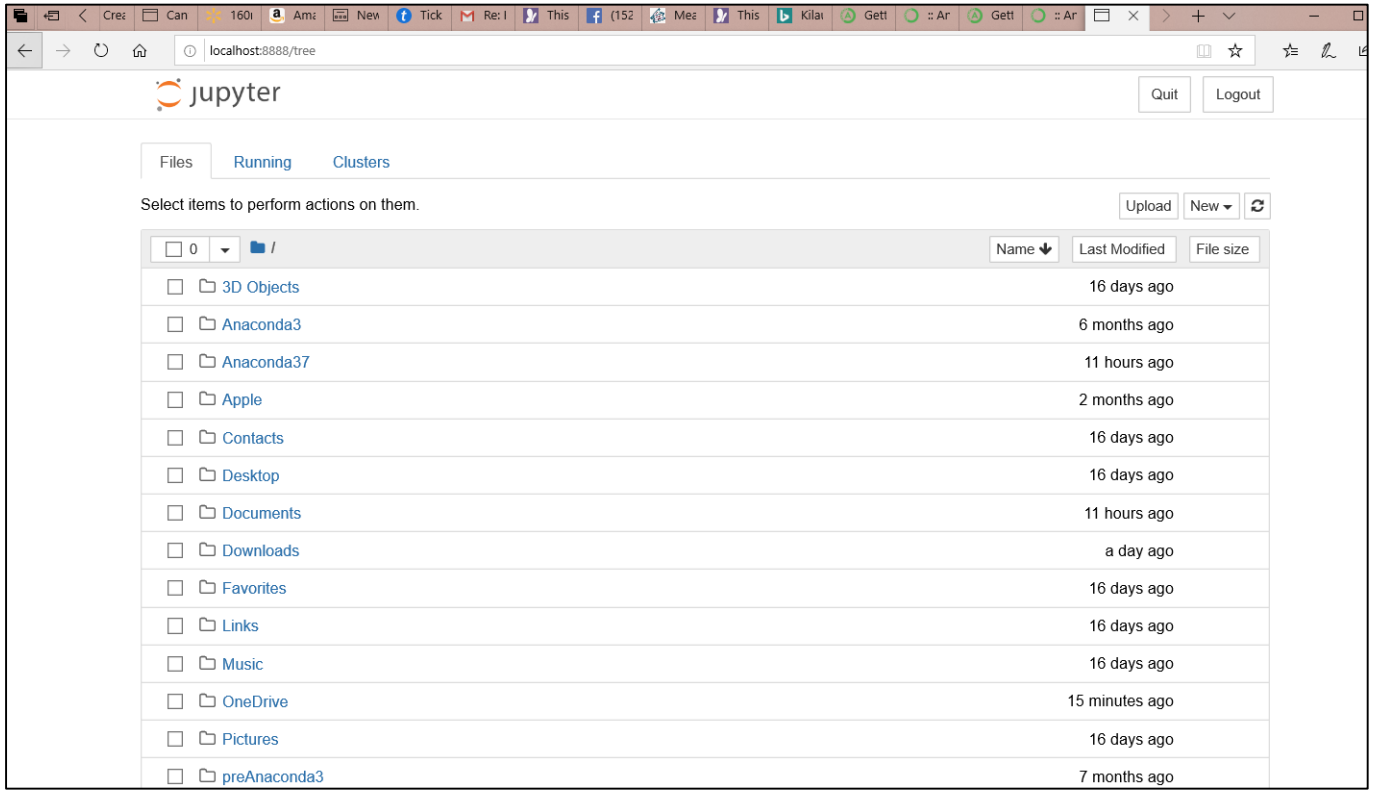


Run Anaconda from your browser

- After you select Jupyter notebook in your Start menu you will see the following display in your default browser (see screen shot).
- **You can also start Anaconda in any browser**. Enter: http://localhost:8888

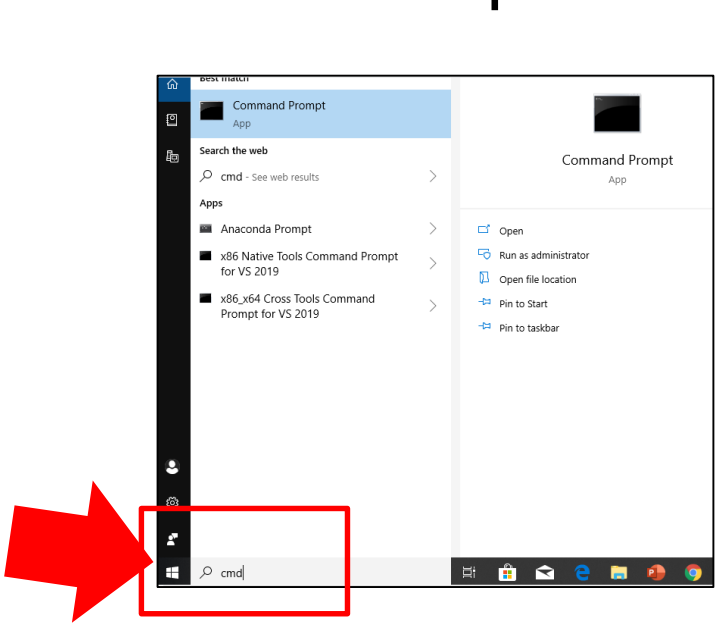
Note: you will need a password. See slide 15.

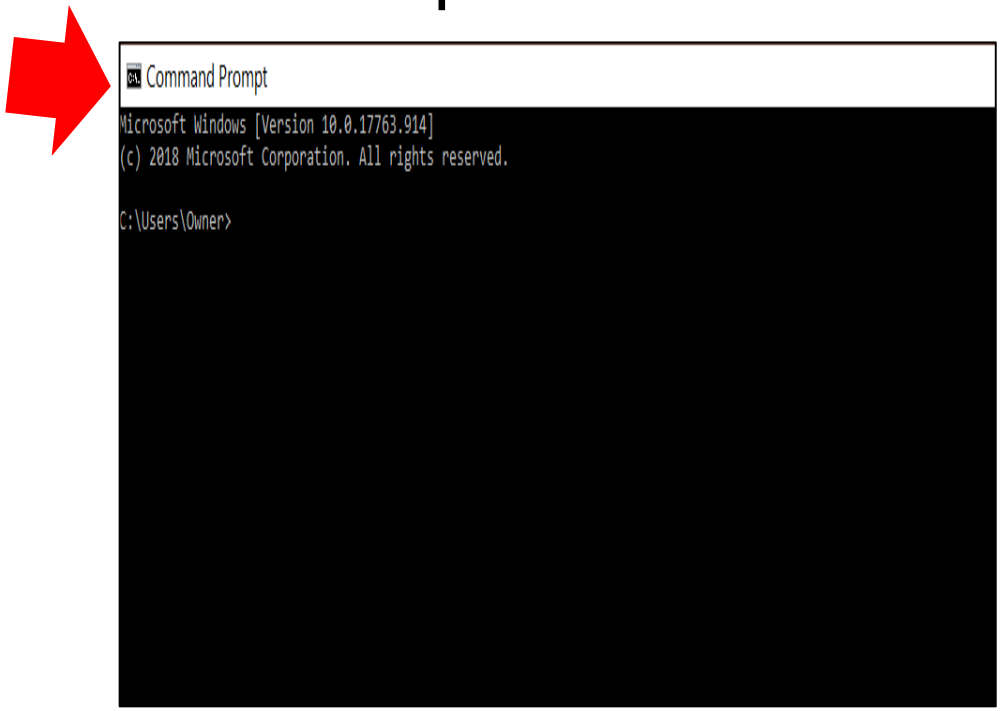
- OR in a terminal window (See next slide).



The Command Prompt window

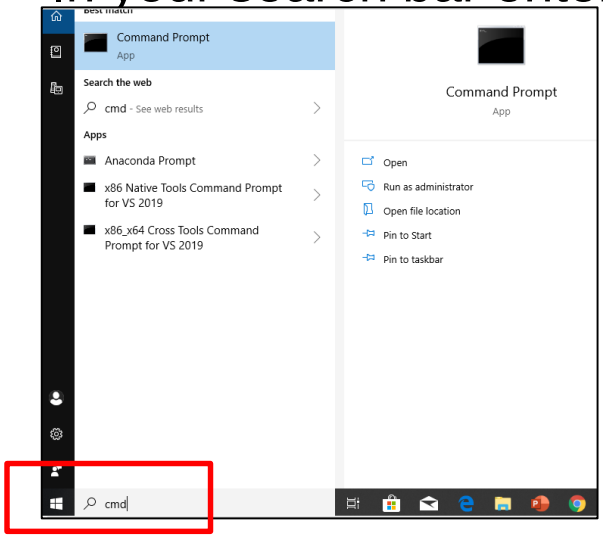
- You need to be familiar with the Command Prompt window to run commands within the operating system.
- In your search bar (bottom left of your screen) enter cmd to open a Command Prompt window

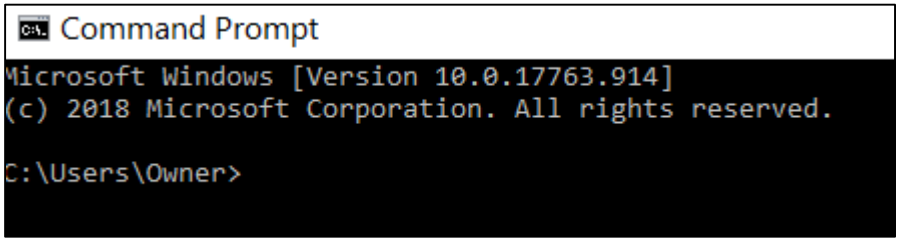




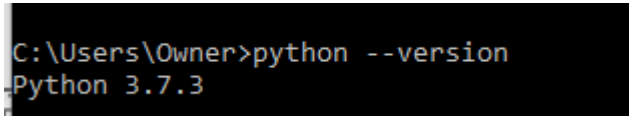
Useful commands to check Anaconda Install

- In your search bar enter cmd. You should see your path name.

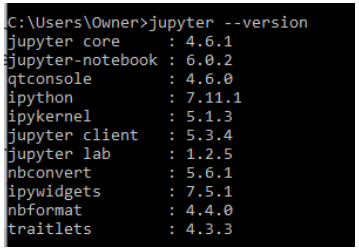




- Enter the following commands to check your python and jupyter notebook versions:
  - python (python version)

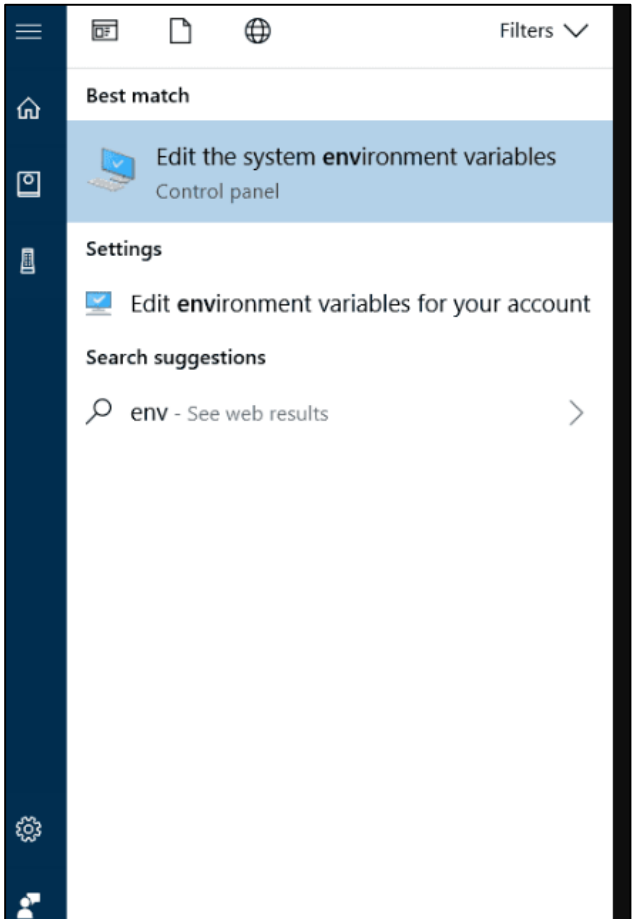


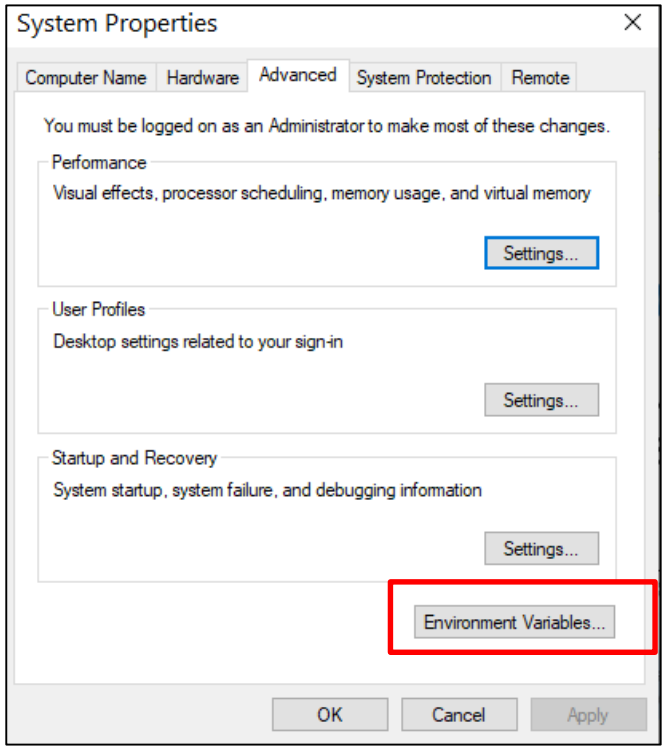
  - jupyter --version (jupyter version)



Check your Environment Variables (1 of 2)

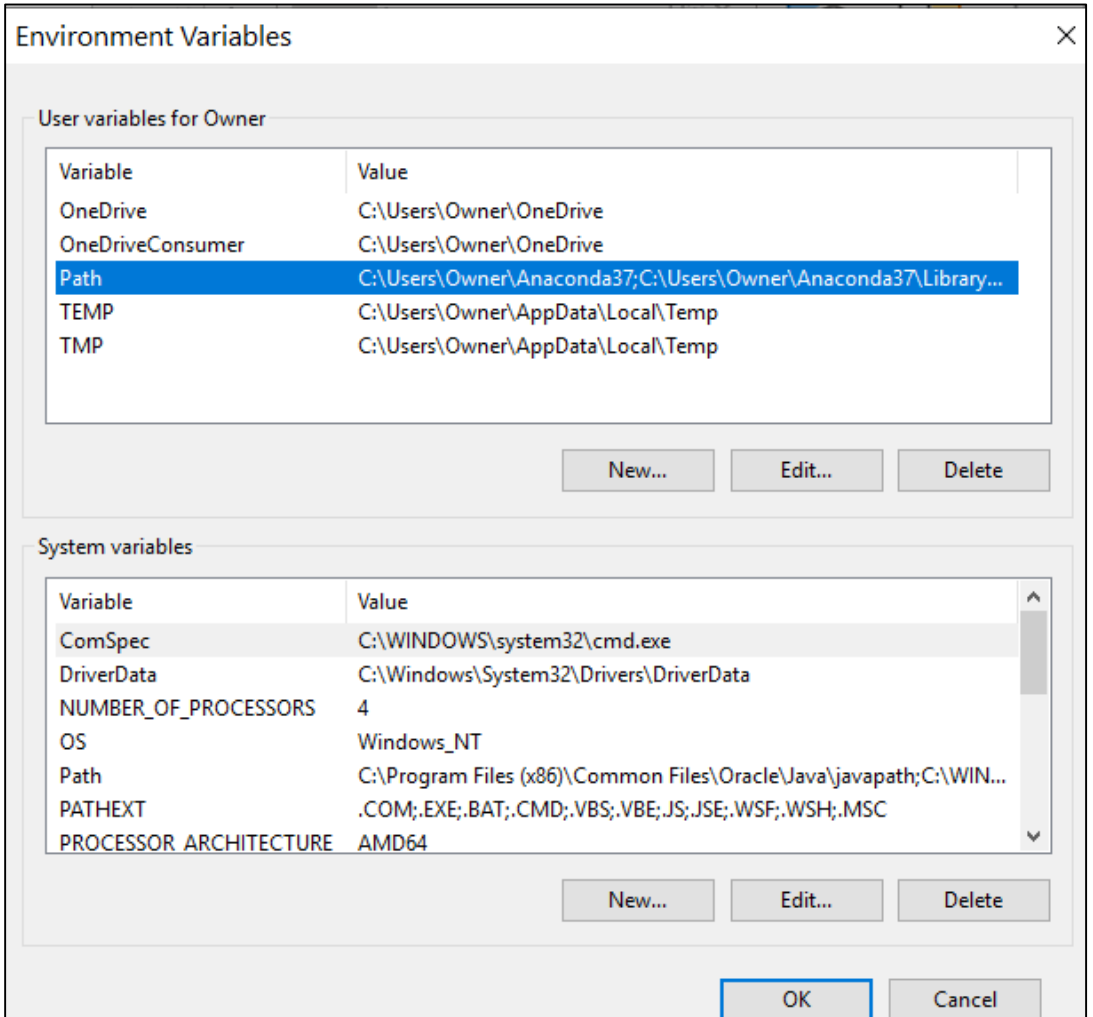
- In your Search box (bottom left), type in "**env**"
- Choose "Edit the system **environment variables**"
- Click the "**Environment Variables**…" button.





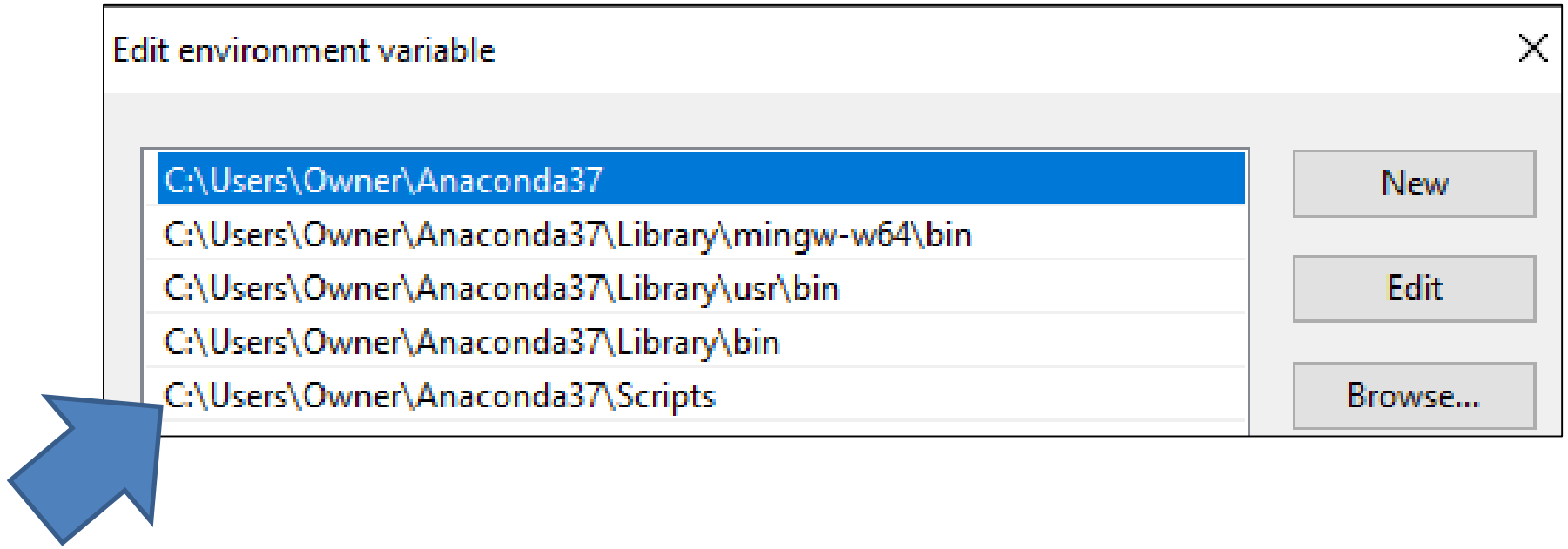
Check your Environment Variables (2 of 2)

- Select Path and Edit. See next slide on paths that should be present after your installation.



My Python path names

- Make sure you have similar paths set up for your env variables in this order.



It is important to have the Scripts path!

How to start the Python Interpreter

- Open a Command Prompt window (cmd)
- At the prompt > enter python

C:\Users\Owner>python

Python 3.7.3 (default, Apr 24 2019, 15:29:51) [MSC v.1915 64 bit (AMD64)] :: Anaconda, Inc. on win32

>>>

>>>

Conda Environment

- Anaconda Python can run in a separate virtual environment on your laptop.
- The default environment is called **base**. You install new Python libraries using a command called conda into a specific conda environment.
- You will see this message if a conda environment is not activated for your Anaconda. **This is only for the Windows operating system!**

```
C:\Users\Owner>python
Python 3.7.3 (default, Apr 24 2019, 15:29:51) [MSC v.1915 64 bit (AMD64)] :: Anaconda, Inc. on win32

Warning:
This Python interpreter is in a conda environment, but the environment has
not been activated.  Libraries may fail to load.  To activate this environment
please see https://conda.io/activation

Type "help", "copyright", "credits" or "license" for more information.
>>>
```

- To check your conda environment enter at the prompt >

>conda env list

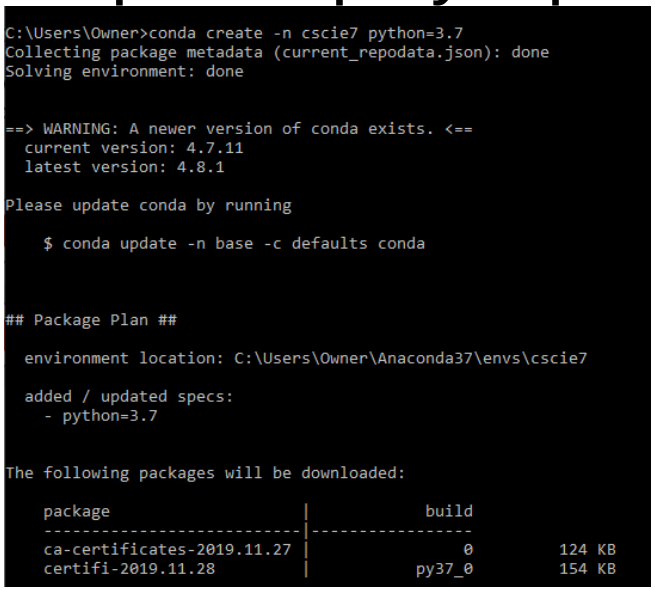
```
C:\Users\Owner>conda env list
# conda environments:
#
base                  *  C:\Users\Owner\Anaconda37
```

Create Conda Environment

- When you create your conda environment you can default the version of Python associated with it.
- This new conda environment is separate from the base conda environment.
- To create an environment with a specific version of Python:

>C:\Users\Owner>**conda create -n cscie7 python=3.7**

- Note: When the output displays: proceed ([y]/n) enter: y



Activate your Conda Environment

- You must activate your conda environment to use a specific virtual environment different than the base environment.
- Activate the new environment:

>conda activate cscie7

```
C:\Users\Owner>conda activate cscie7

(cscie7) C:\Users\Owner>
```

- You can verify your environment was created:

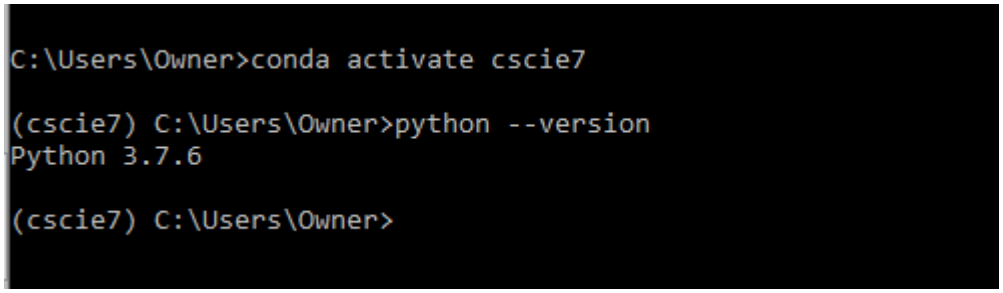
>conda env list

```
C:\Users\Owner>conda env list
# conda environments:
#
base                  *  C:\Users\Owner\Anaconda37
cscie7                   C:\Users\Owner\Anaconda37\envs\cscie7
```

Check your Python version in Conda Env

- Activate your conda environment:

>conda activate cscie7



How to start Jupyter Notebook

- Activate your conda environment

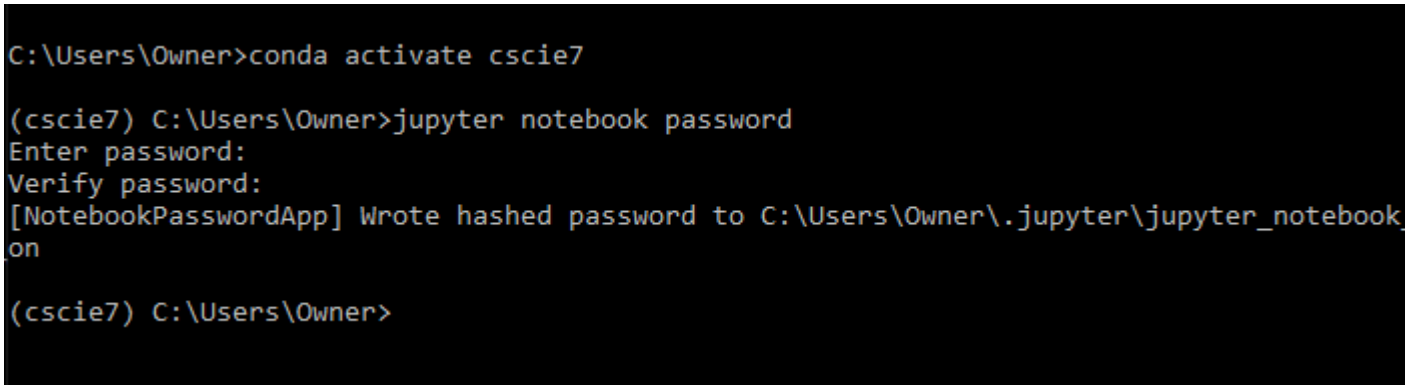
```
C:\Users\Owner>conda activate cscie7

(cscie7) C:\Users\Owner>
```

- At the Command prompt > type jupyter notebook

```
C:\Users\Owner>conda activate cscie7

(cscie7) C:\Users\Owner>jupyter notebook
[I 21:31:35.387 NotebookApp] JupyterLab extension loaded from C:\Users\Owner\Anaconda37\lib\site-packages\jupyterlab
[I 21:31:35.388 NotebookApp] JupyterLab application directory is C:\Users\Owner\Anaconda37\share\jupyter\lab
[I 21:31:35.418 NotebookApp] Serving notebooks from local directory: C:\Users\Owner
[I 21:31:35.418 NotebookApp] The Jupyter Notebook is running at:
[I 21:31:35.419 NotebookApp] http://localhost:8888/
[I 21:31:35.420 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
```

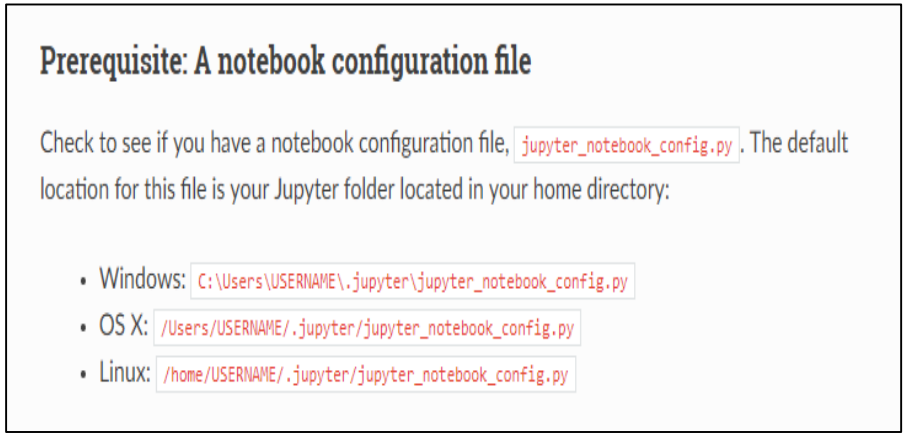
Setting up a Password for Anaconda

- Open another Command window using cmd:
- Type: jupyter notebook password and enter your password.



Jupyter Notebook Password Configuration

- Check if your notebook configuration for your password exists.
- Open a Command Prompt window (run)
- Activate your conda environment >conda activate cscie7
- At the > type: .jupyter\jupyter_notebook_config.py



Prerequisite: A notebook configuration file

Check to see if you have a notebook configuration file, `jupyter_notebook_config.py`. The default location for this file is your Jupyter folder located in your home directory:

- Windows: `C:\Users\USERNAME\.jupyter\jupyter_notebook_config.py`
- OS X: `/Users/USERNAME/.jupyter/jupyter_notebook_config.py`
- Linux: `/home/USERNAME/.jupyter/jupyter_notebook_config.py`

Jupyter Notebook config file

jupyter_notebook_config - Notepad

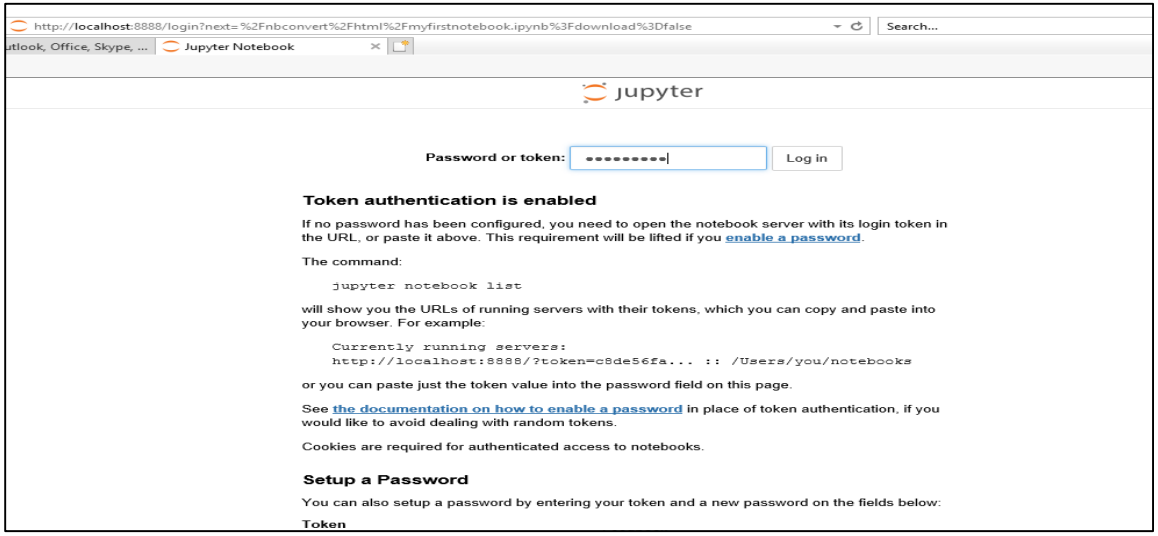
File Edit Format View Help

```
# Configuration file for jupyter-notebook.

#------------------------------------------------------------------------------
# Application(SingletonConfigurable) configuration
#------------------------------------------------------------------------------

## This is an application.

## The date format used by logging formatters for %(asctime)s
#c.Application.log_datefmt = '%Y-%m-%d %H:%M:%S'

## The Logging format template
#c.Application.log_format = '[%(name)s]%(highlevel)s %(message)s'

## Set the log level by value or name.
#c.Application.log_level = 30

#------------------------------------------------------------------------------
# JupyterApp(Application) configuration
#------------------------------------------------------------------------------

## Base class for Jupyter applications

## Answer yes to any prompts.
```

Windows (CRLF) Ln 1, Col 1 100%

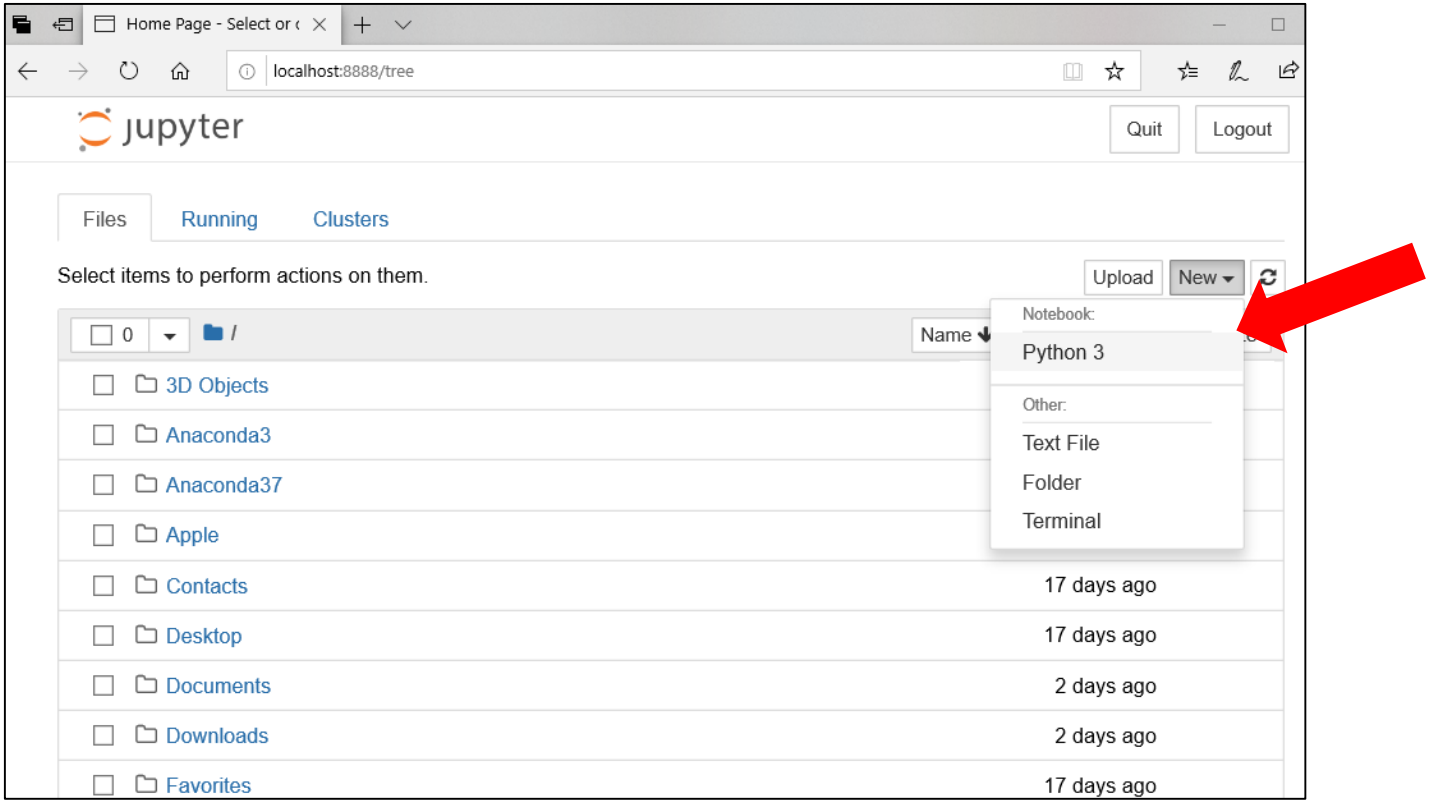
Password Page

- Enter your password you created.



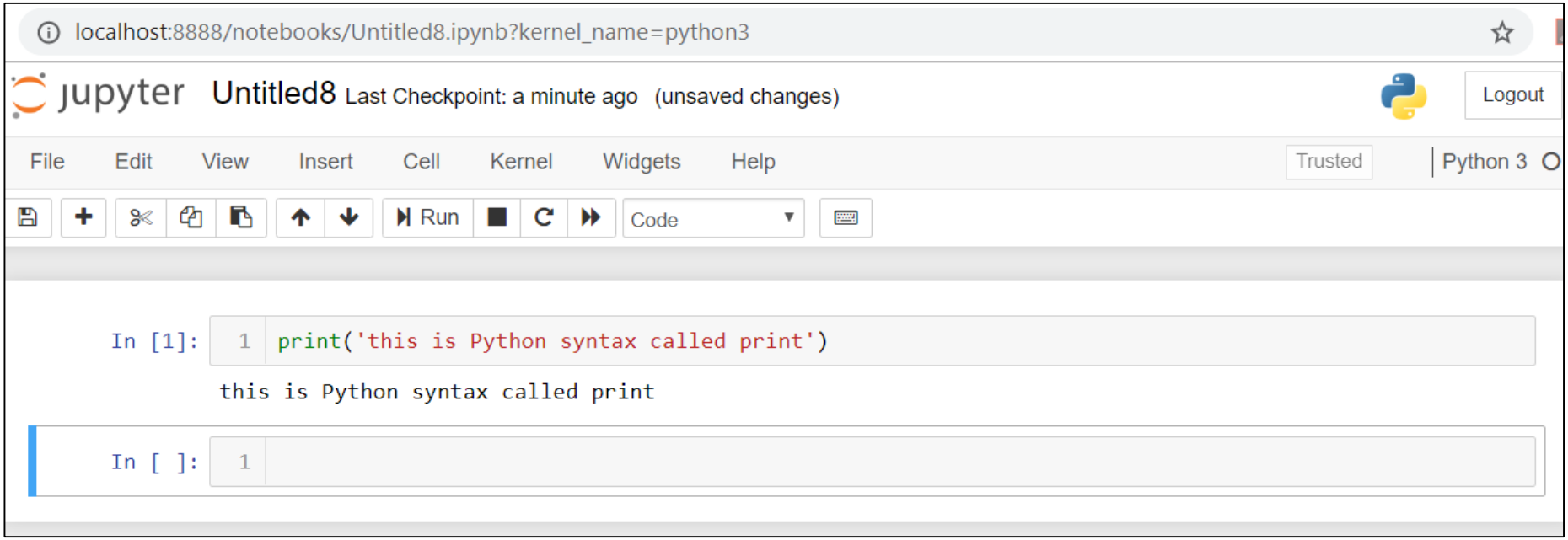
How to open a new Notebook

- Below is the jupyter notebook page.
- In the display below select the New button and Python 3 to open a new notebook.

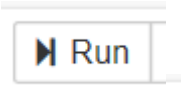


Jupyter Notebook: Input cells

- You have input cells in Jupyter notebooks to run your Python code and then your results are displayed on the next line.
- At the **In** cell you type Python code.

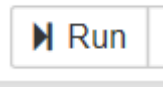


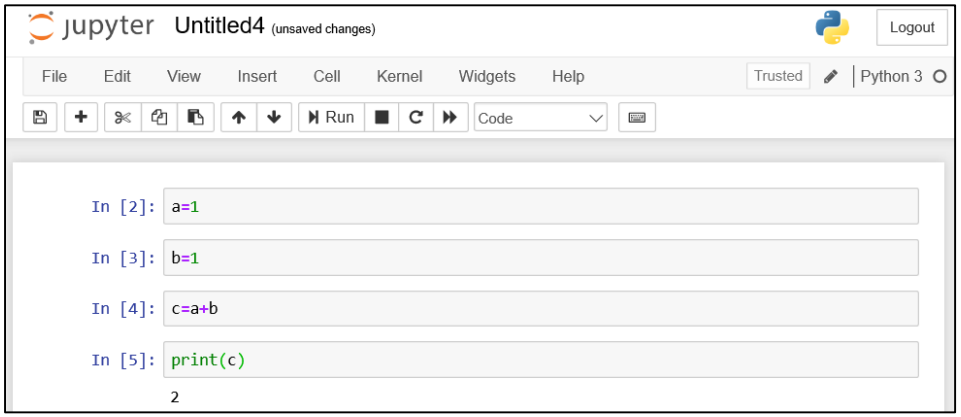
A Simple Python example

* Try this Python example:
1. In the first cell type: a=1 then select 

2. In the next cell type b=1 then select 

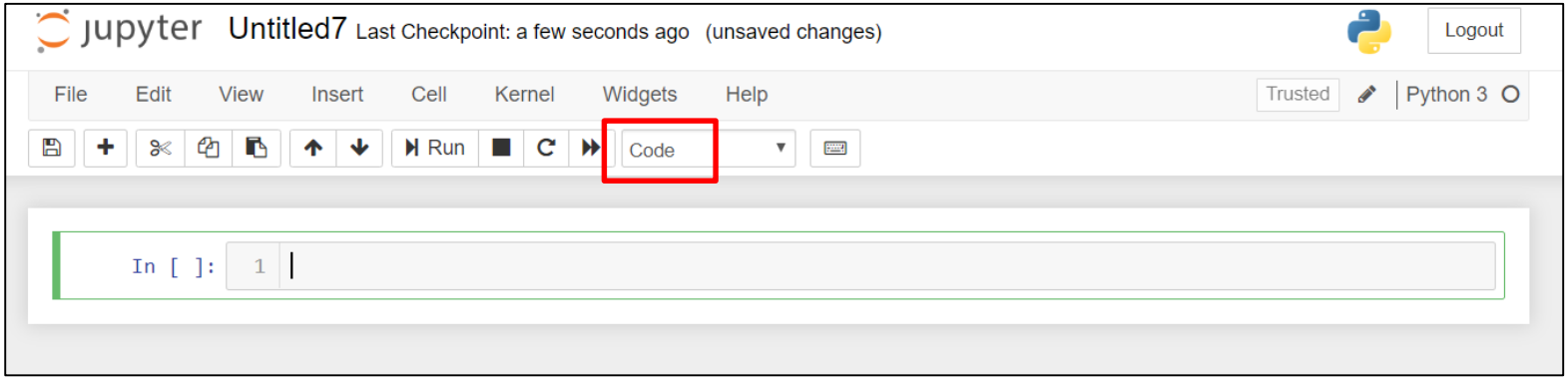
3. In the third cell type c=a+b then select 

4. In the fourth cell type print(c) then select 



Adding Comments

- You can also make any cell a comment. This is called a Markdown cell. You must change the cell from Code to comment.



Use the Cell menu selection, the toolbar or the key shortcut m to change the cell from Input to comment.

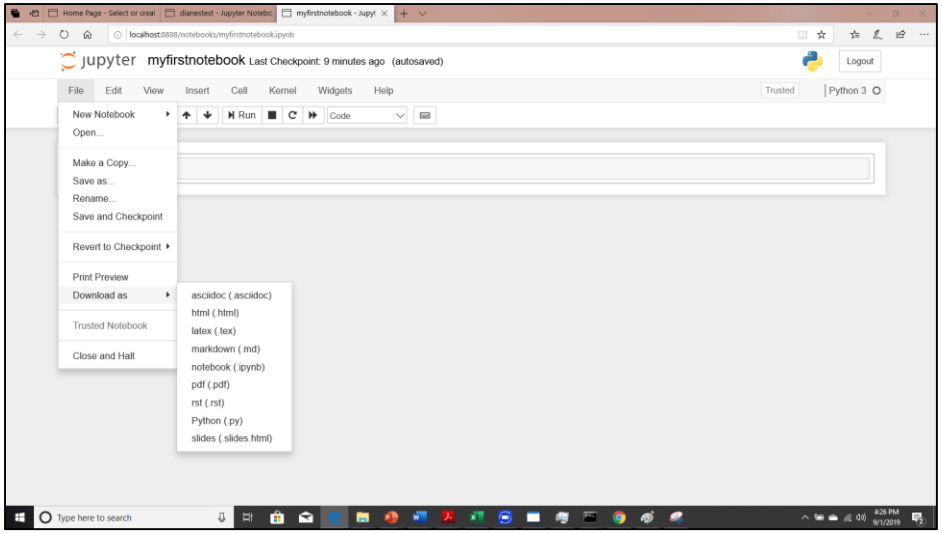
Saving your Notebook File

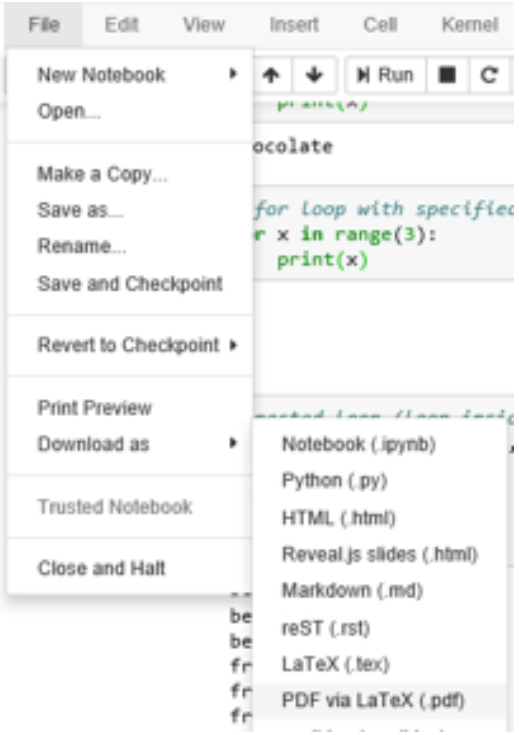
- Your notebook is currently not saved and does not have an intuitive title.
- Under Files select Rename and name your notebook: myfirstnotebook
- Select Files -> Save and Checkpoint
- Closeyour notebook by selecting Files -> Close and Halt
- You will have a file called MyFirstNotebook.ipynb. This is one of the files you need to submit for homework. The other is a pdf.
- In your Anaconda command prompt hit Control-C this will kill your browser.
- Open terminal window and type juypter notebook.
- Now you will see your notebook that you created and can select it or open a new notebook by selecting “New” in the righthand corner.

Save your Notebook to PDF

- Select download as:

You should see these options to save your file:





You could use Google, Internet Explorer browsers to **save as a PDF in the Print option**. Microsoft Edge does not have this feature.

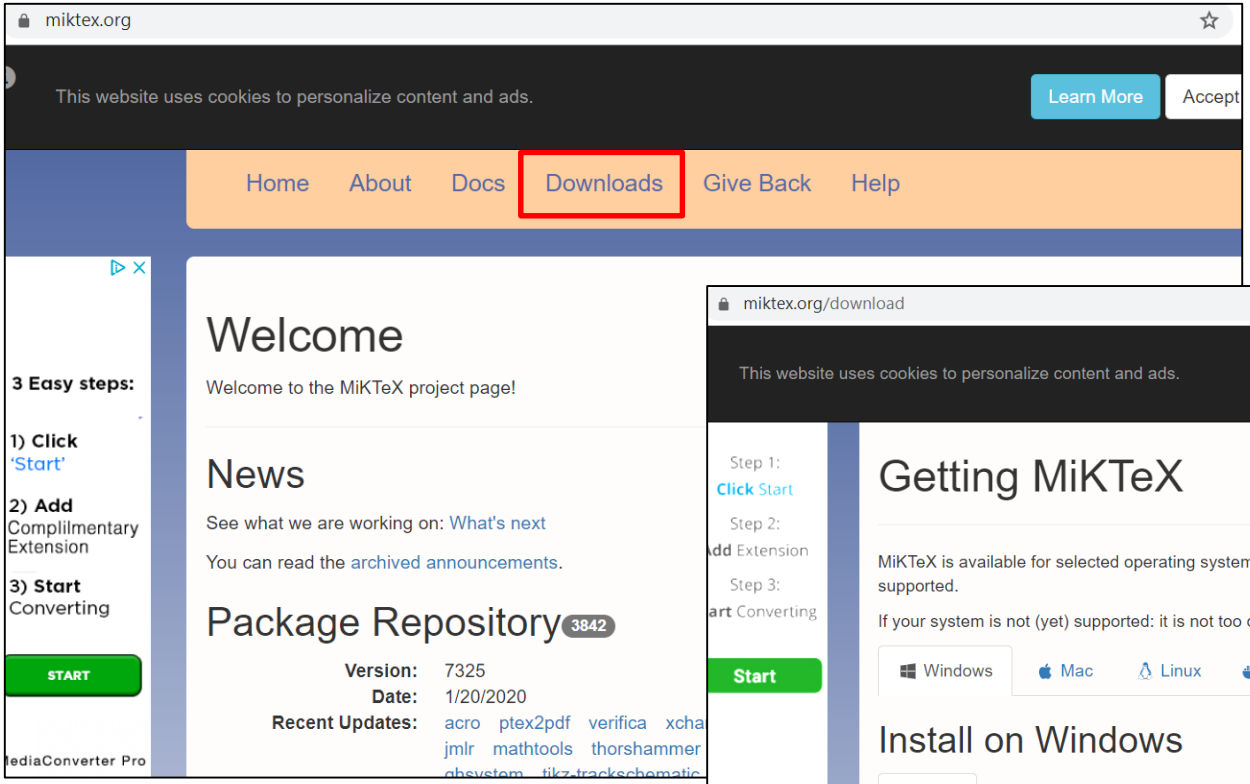
OR

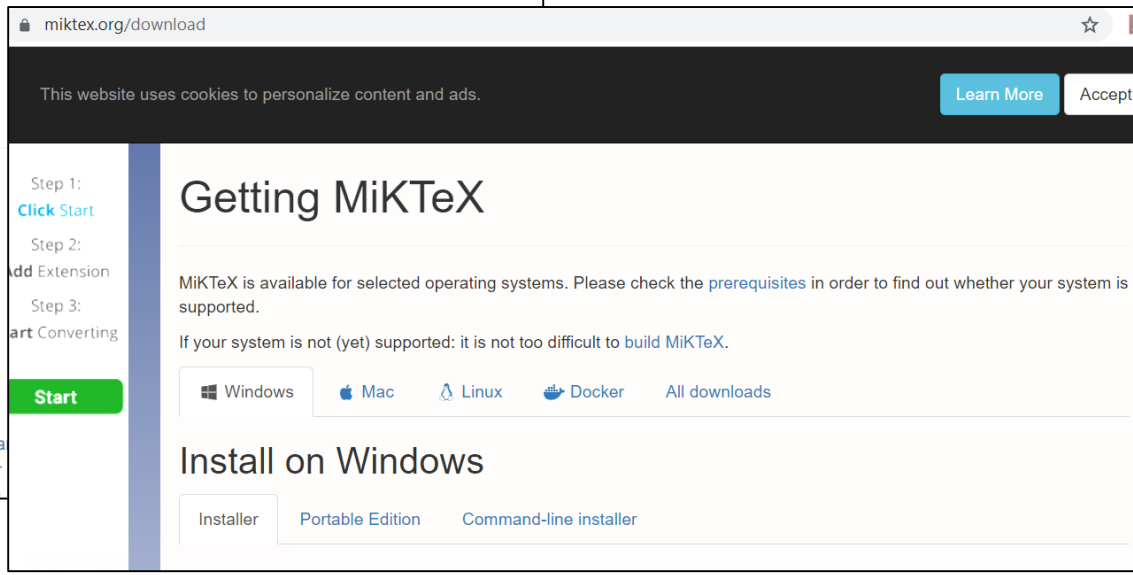
- You can download MiKTex: https://miktex.org/

Saving Notebooks as PDF

- After installing Anaconda you should install MiKTeX. This library will allow you to save PDFs in Anaconda.

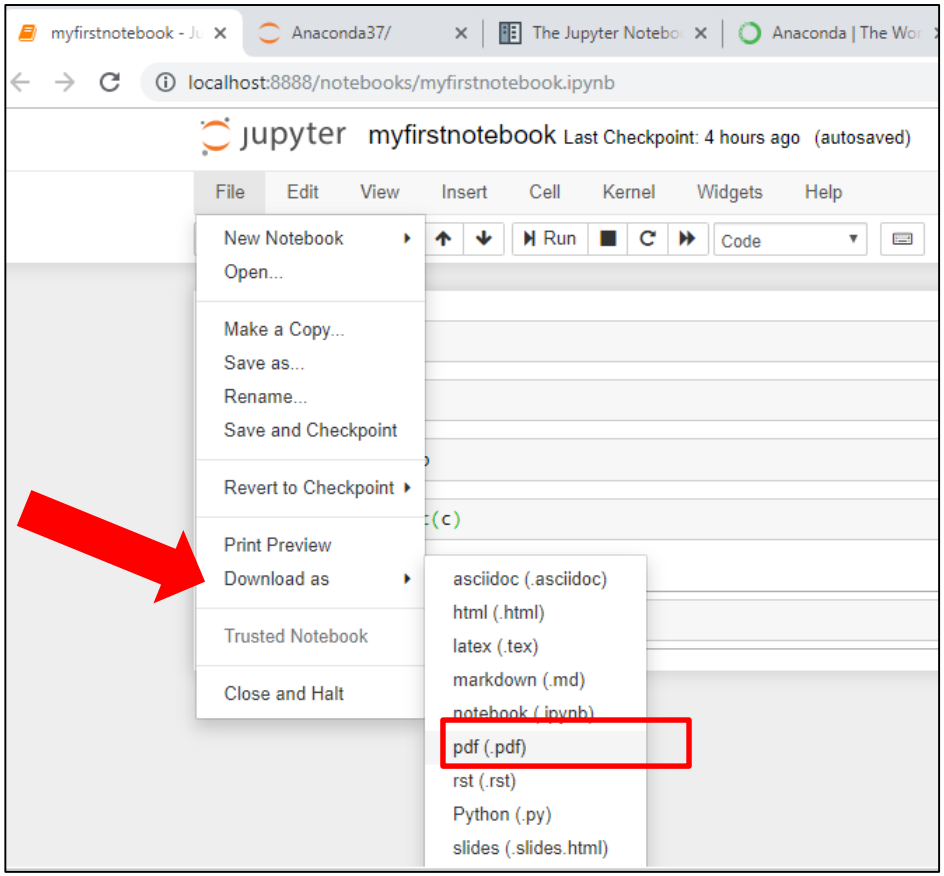
There are excellent steps of all screens at miktex.org





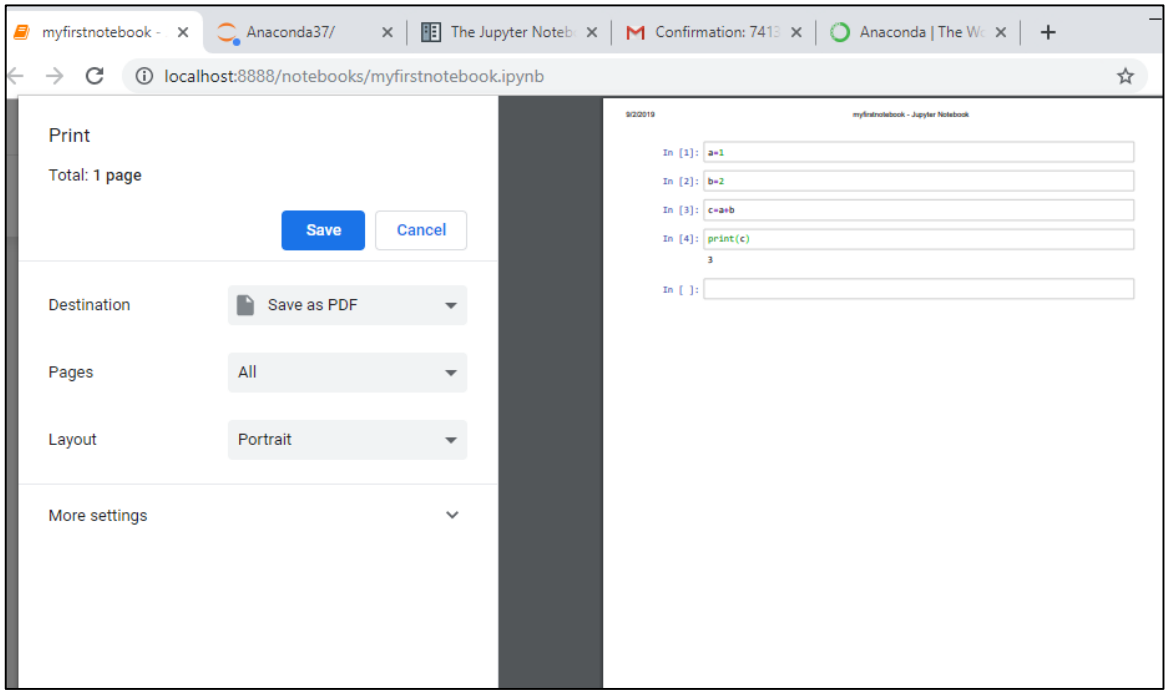
Save as PDF in Anaconda

After you install MiKTex you will see the following option in your Notebook under File. Select **Download as** and then Select pdf.



Google Chrome example

- Another option on how to print your notebook.
- Go to Print in your Chrome browser then select Save with Destination set to Save as PDF.



Useful References

- https://jupyter.org/documentation
- https://www.edureka.co/blog/wp-content/uploads/2018/10/Jupyter_Notebook_CheatSheet_Edureka.pdf
- https://docs.conda.io/projects/conda/en/latest/_downloads/843d9e0198f2a193a3484886fa28163c/conda-cheatsheet.pdf
- https://miktex.org/docs
- https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html#creating-an-environment-with-commands