CHOCOLATE CHIP MUFFIN: PROGRAMMING BASICS FOR MACHINE LEARNING

LESSON 3 BASIC

CREATED BY
AMARDEEP SINGH SIDHU

ROOT

Python?? 9

Python Byte Code 10

Works Cited 12

Index 13

WORKING WITH IMPLEMENTATIONS & !ARCHITECTURES

The Great chocolate chip muffin problem

Hi There I would like to buy a chocolate chip muffin

Baker gives me this

(Chocolate muffin with chips)

I was expecting this

(Regular muffin with chi

Both types of muffin can be considered as "Chocolate Chip Muffin". They are both implementation of a great original idea. (I Still think my choice is correct) 🙂

In Computer Engineering we work with implementations of programming language (not language itself)

In machine learning (data engineering) we work with implementation of model/architecture not (SOTA) architecture itself.

Unless of course you are yourself trying to improve the language/framework or architecture or contributing to it in some form.

GITHUB REPO

https://github.com/AIEdX

LESSON- YOUTUBE VIDEO

- Video 1: https://youtu.be/aIAS39NUKXU
- Video 2: https://youtu.be/bBwYlexy-eM

JUPYTER NOTEBOOK

Jupyter (IPython) notebook files are simple JSON documents, containing text, source code, rich media output, and metadata. Each segment of the document is stored in a cell.[1]

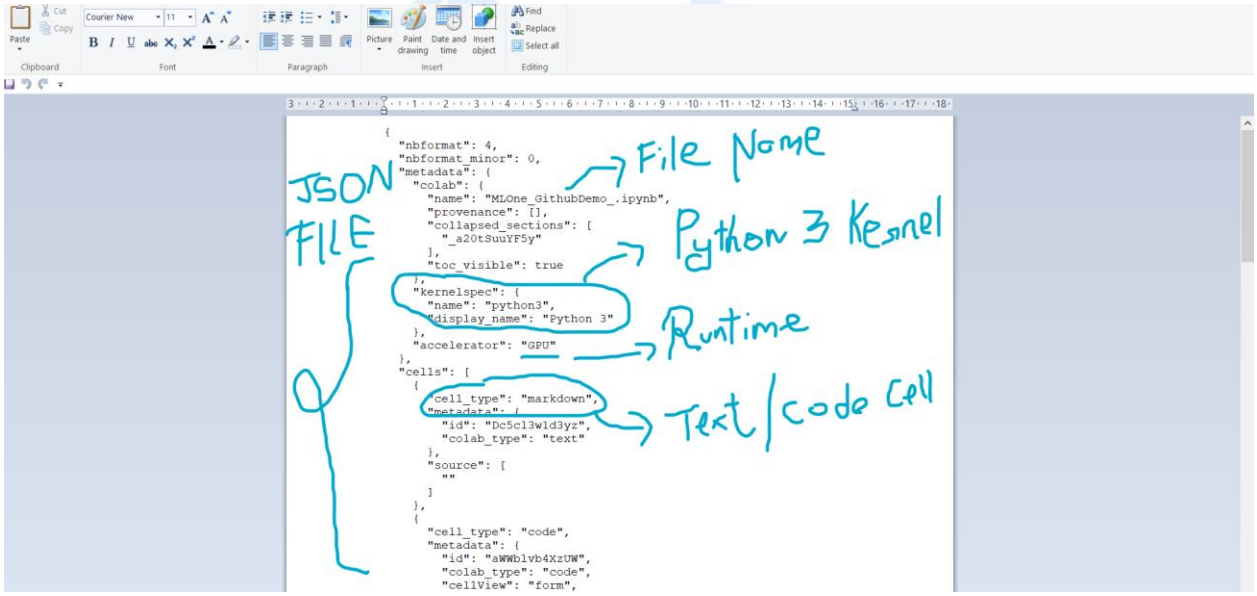
Advantages

- Interleave Code and Comment cell.
- Great to showcase proof of concepts or demonstration of experimental setup. (Great for Prototyping)
- Can create complete book style lessons for education with theory and code in same notebook.
- Runs in a browser and it's easy to share notebooks.
- Great for instant and shallow debugging.
- Its not an IDE (Integrated Development Environment)

Disadvantages

- Its not an IDE (Integrated Development Environment)!

Jupyter notebooks are basically small text files that can be opened with any editor or with WordPad/notepad



[1] *Jupyter Notebook*. (n.d.). Retrieved from https://nbformat.readthedocs.io/en/latest/

WORKING WITH HTML AND LATEX ON JUPYTER NOTEBOOK

You can easily work with Latex and Mathjax and write equations and mathematical expressions with ease.

GOOGLE COLAB

ALTERNATIVES

- Paperspace
- Amazon SageMaker
- Kaggle
- Many More!!!!!

RUNNING EXAMPLE- GOOGLE COLAB

Refer Lesson YouTube Video

RUNNING EXAMPLE- JUPYTER NOTEBOOK ON YOUR LOCAL ENVIRONMENT

Refer Lesson YouTube Video

INSTALLATION

PACKAGING

CONDA (ANACONDA)

Conda[2] is an open source package management system and environment management system that runs on Windows, macOS and Linux. Conda quickly installs, runs and updates packages and their dependencies. Conda easily creates, saves, loads and switches between environments on your local computer. It was created for Python programs, but it can package and distribute software for any language.

The conda package and environment manager is included in all versions of Anaconda and Miniconda.

ANACONDA NAVIGATOR

Install Anaconda from this link

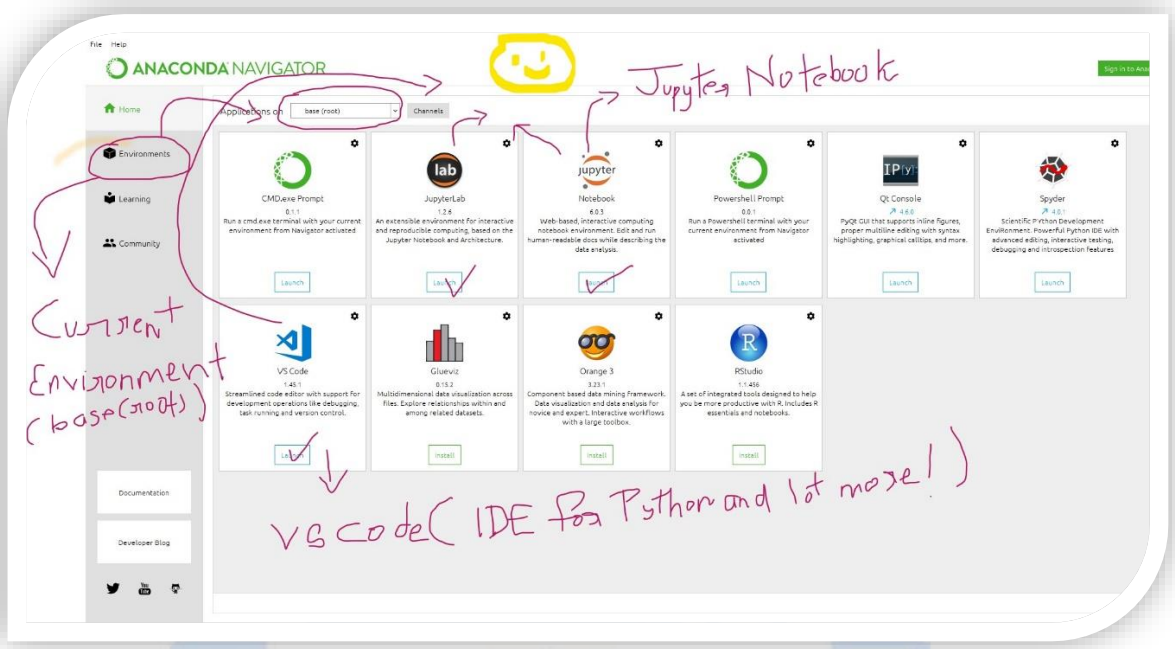
Anaconda Navigator[3] is a desktop graphical user interface (GUI) included in Anaconda® distribution that allows you to launch applications and easily manage conda packages, environments, and channels without using

[2] (Conda) https://docs.conda.io/en/latest/

[3] (Anaconda Navigator) https://docs.anaconda.com/anaconda/navigator/

command-line commands. Navigator can search for packages on Anaconda Cloud or in a local Anaconda Repository. It is available for Windows, macOS, and Linux

Figure 1: Anaconda Navigator



ANACONDA PROMPT

Anaconda prompt is command line interface

FEW HELPFUL COMMANDS

Command / Key	Use
cd / cd /d/ D:	Only cd displays current directory Change to D Drive (/d enables you to change drive)
dir dir Anaconda /AD /s	List down all directory [4] Find and list down the directory/ path to where "Anaconda" Folder is located (/D will help list only directory with name Anaconda)
pip install	Install a particular package from pypi
Conda install	Install a particular package from conda
where python	Find out where python is installed in current anaconda environment
conda env list	List out all conda environment
Ctrl+Z or exit()	Exit Python
Ctrl+C	Exit current terminal command

[4] (PYPI) https://pypi.org/

Conda User Guide

https://docs.conda.io/projects/conda/en/latest/user-guide/tasks/manage-environments.html

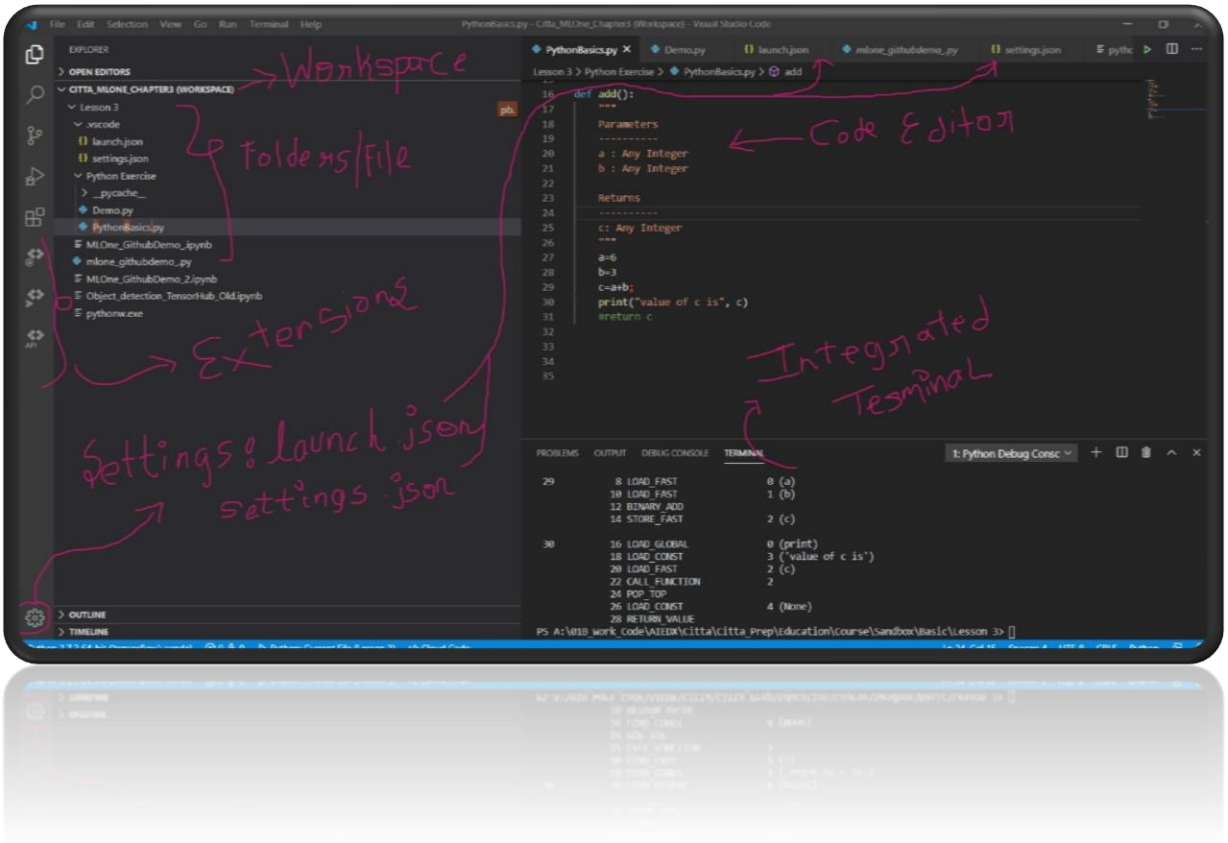
PIP

pip is the package installer for Python[5]. You can use pip to install packages from the Python Package Index and other indexes.

VS CODE

Visual Studio Code[6] is a lightweight but powerful source code editor which runs on your desktop and is available for Windows, macOS and Linux. It comes with built-in support for JavaScript, TypeScript and Node.js and has a rich ecosystem of extensions for other languages (such as C++, C#, Java, Python, PHP, Go) and runtimes (such as .NET and Unity)

Figure 2: VS Code

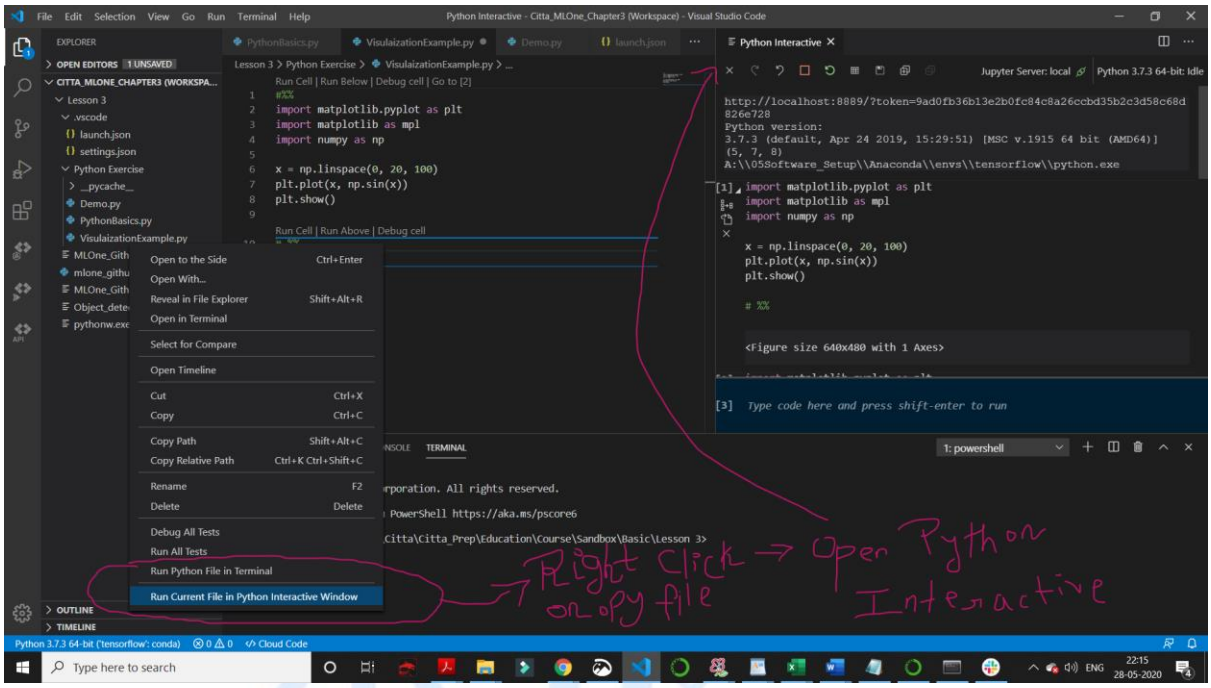


[5] (PIP) https://pypi.org/project/pip/

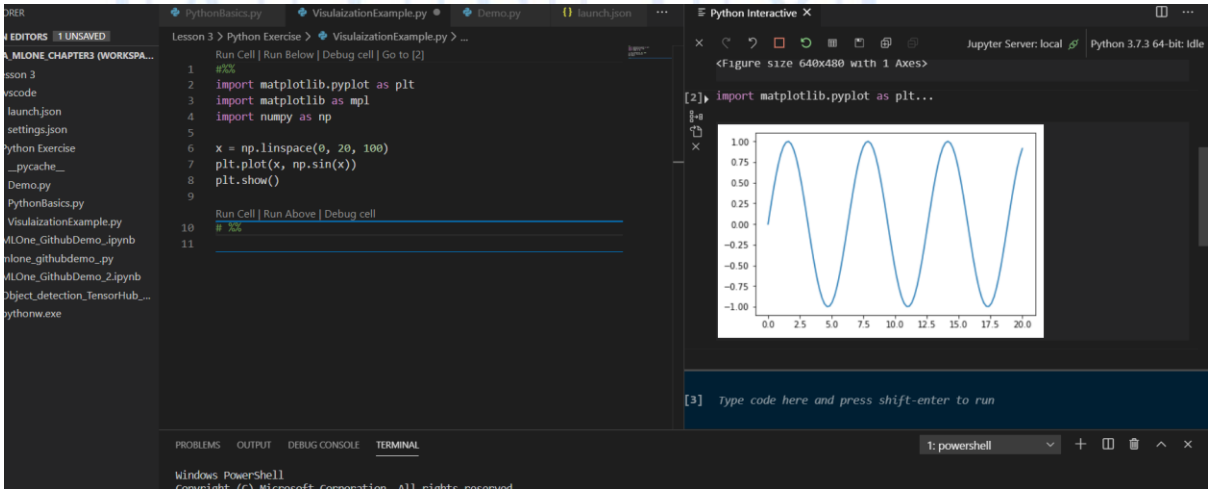
[6] (VSCode) https://code.visualstudio.com/docs

RUNNING JUPYTER NOTEBOOK IN VS CODE

1. Run Jupyter notebook in VS Code[7]

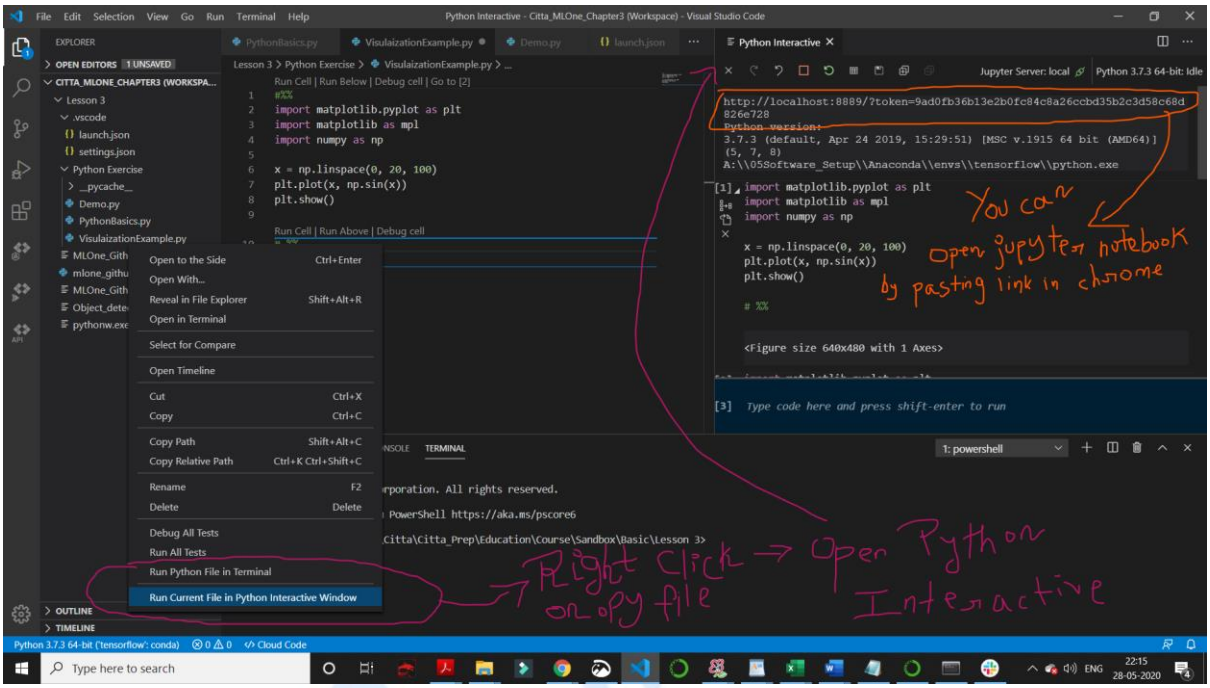


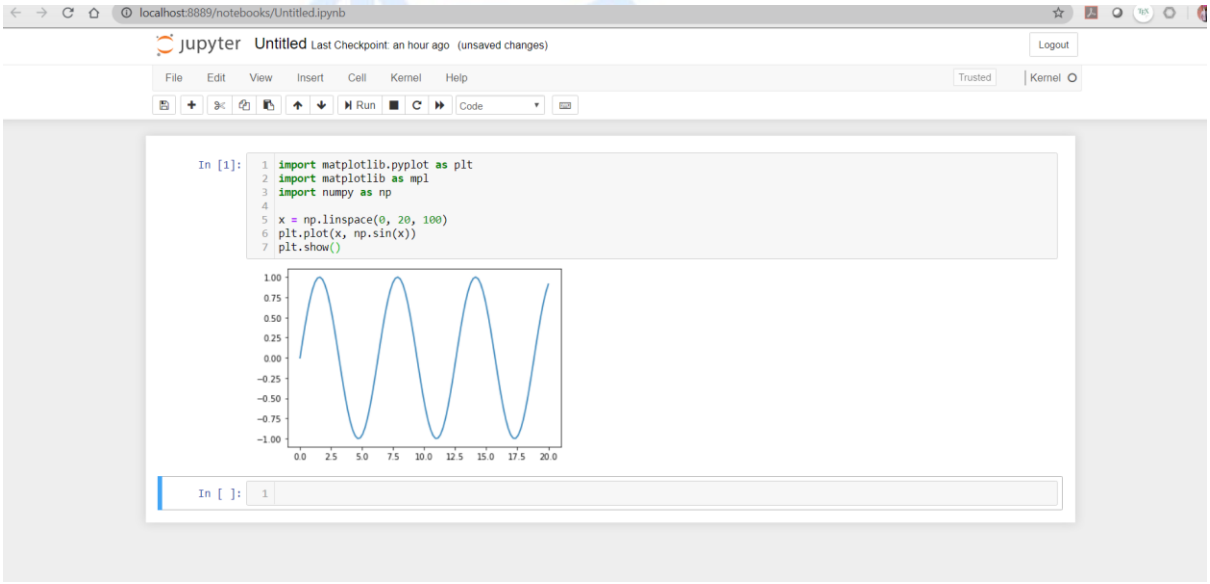
2. View plot in python interactive screen on top right of VS Code.



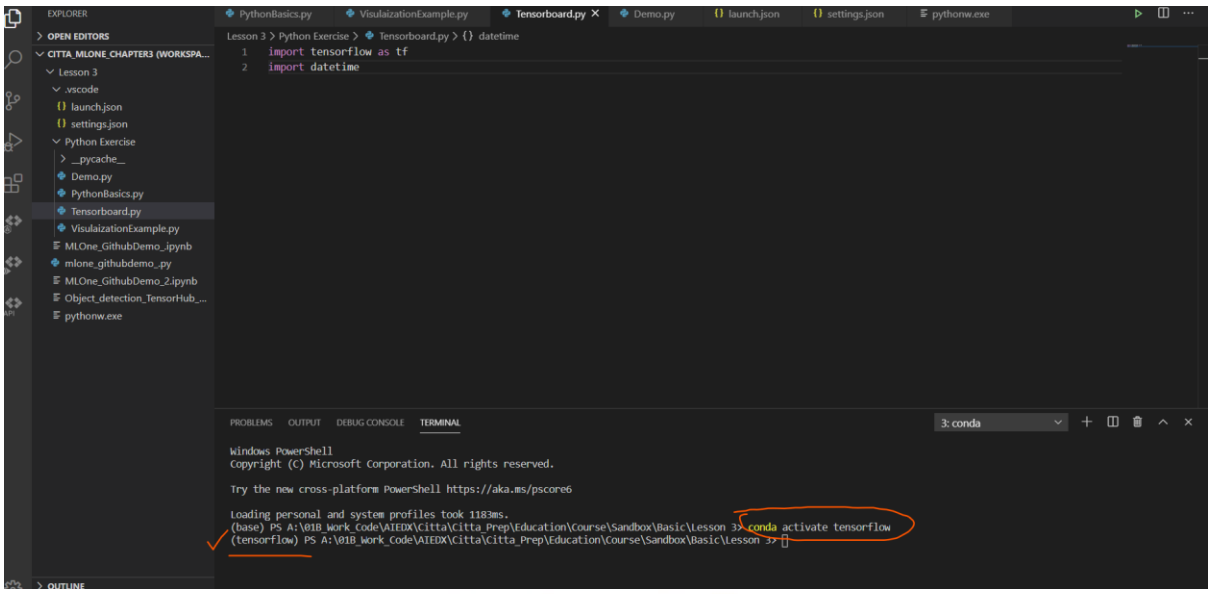
[7] (Jayamanne) https://donjayamanne.github.io/pythonVSCodeDocs/docs/jupyter_examples/

3. You can also open Jupyter notebook in browser by copy pasting this link (Orange Circle below)





ACTIVATING CONDA ENVIRONMENT IN VS CODE



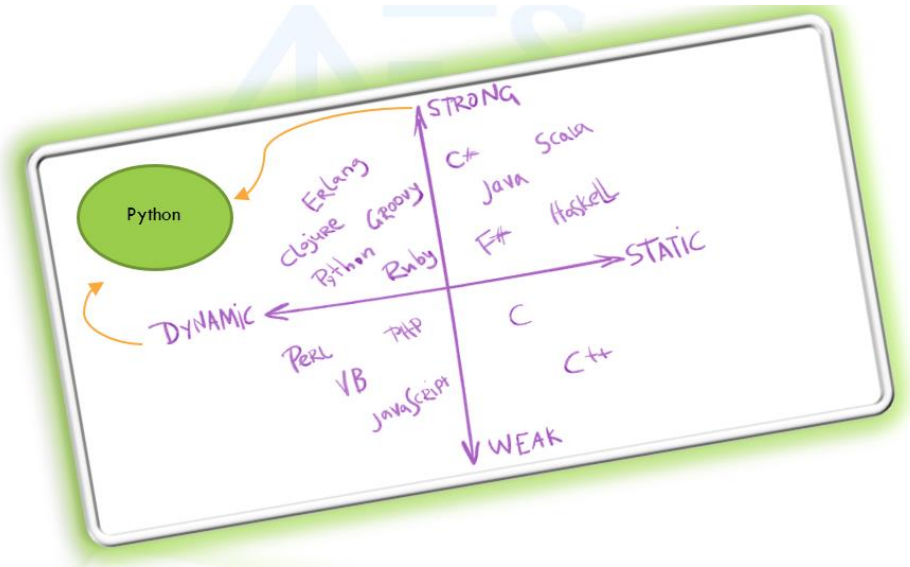
PYTHON??

Check your implementation

```
(base) A:\05Software_Setup\Anaconda>python
Python 3.6.10 |Anaconda, Inc.| (default, Jan  7 2020, 15:18:16) [MSC v.1916 64 bit (AMD64)] on win3
2
Type "help", "copyright", "credits" or "license" for more information.
>>> import platform; platform.python_implementation()
'CPython'
>>>
```

Cpython

Figure 3: Different Languages based on type



Source: https://android.jlelse.eu/magic-lies-here-statically-typed-vs-dynamically-typed-languages-d151c7f95e2b

PYTHON BYTE CODE

Is Python Compiled or Interpreted? This blog gives a great insight into this subject.[8]

Answer is Yes, its Interpreted or Maybe No!!! Python compiler convert programs from high level language to byte code. This is a lower level and platform independent representation of your source code.

Figure 4: Python Source Code and Its Corresponding byte code.

```
esson 3 > Python Exercise > PythonBasics.py > add
16  def add():
17      """
18      Parameters
19      ----------
20      a : Any Integer
21      b : Any Integer
22
23      Returns
24      ----------
25      c: Any Integer
26      """
27      a=6
28      b=3
29      c=a+b;
30      print("value of c is", c)
31      #return c
32
33
```

[8] (Batchelder, Ned) https://nedbatchelder.com/blog/201803/is_python_interpreted_or_compiled_yes.html

```
ROBLEMS   OUTPUT   DEBUG CONSOLE   TERMINAL

29           8 LOAD_FAST                0 (a)
            10 LOAD_FAST                1 (b)
            12 BINARY_ADD
            14 STORE_FAST               2 (c)

30          16 LOAD_GLOBAL              0 (print)
            18 LOAD_CONST               3 ('value of c is')
            20 LOAD_FAST                2 (c)
            22 CALL_FUNCTION            2
            24 POP_TOP
            26 LOAD_CONST               4 (None)
            28 RETURN_VALUE
```

Figure 5: Workflow of Python Execution

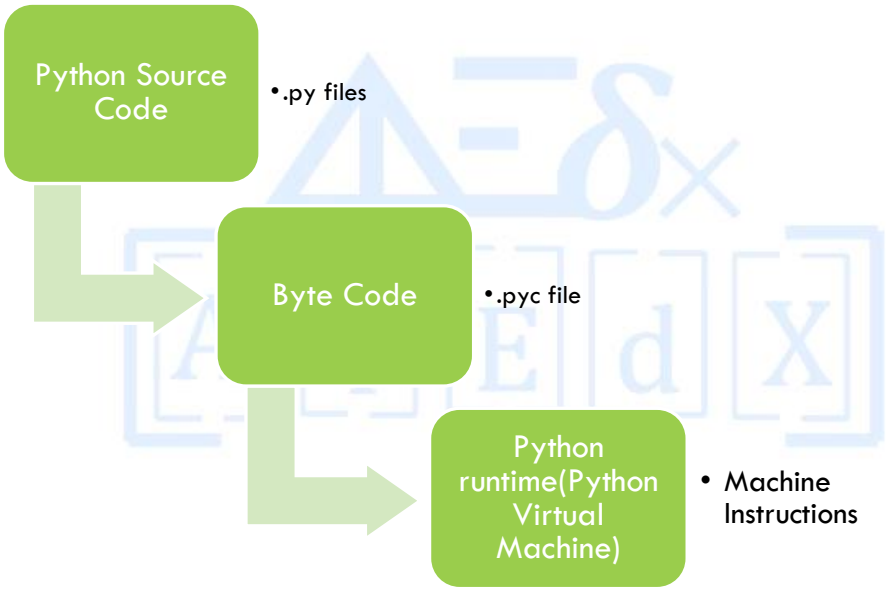
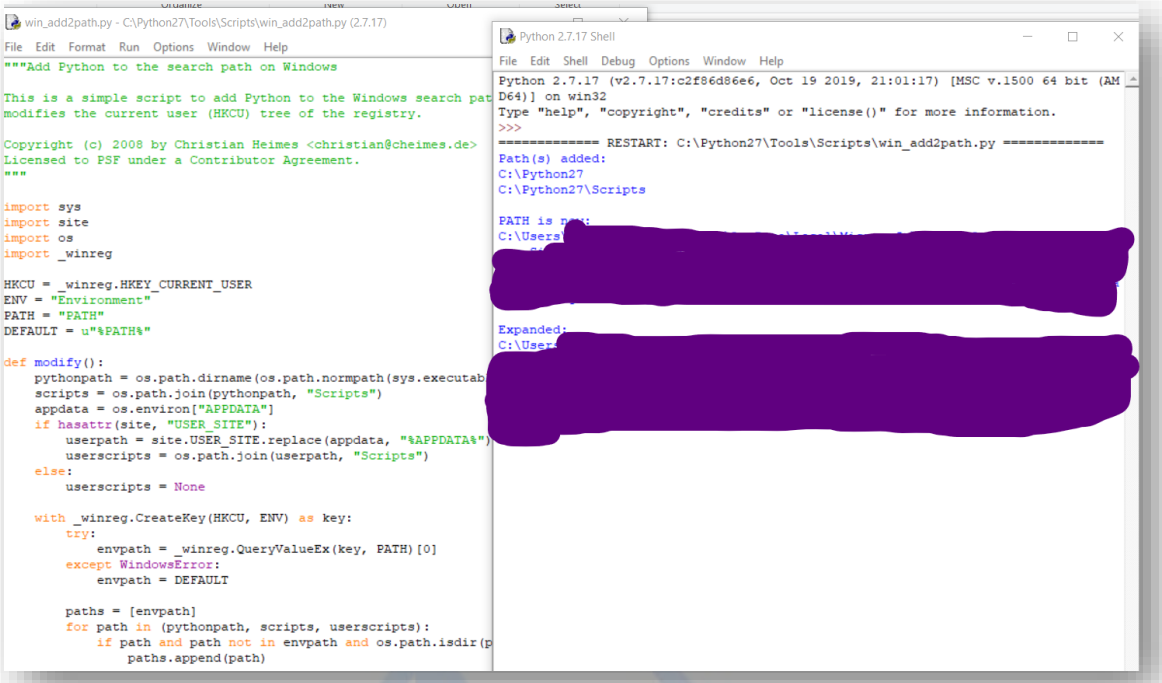


Figure 6: Adding Path using existing script



WORKS CITED

Batchelder, Ned. (n.d.). *Ned Batchelder*. Retrieved 2020, from Ned Batchelder Blog Is Python Interpreted: https://nedbatchelder.com/blog/201803/is_python_interpreted_or_compiled_yes.html

Conda. (n.d.). Retrieved from Conda: https://docs.conda.io/en/latest/

Google . (2020). *Object Detection at Tensorflow Hub*. Retrieved from Tensorflow Hub: https://www.tensorflow.org/hub/tutorials/object_detection#

Jupyter. (n.d.). *MathJax Latex*. Retrieved from https://jupyter-notebook.readthedocs.io/en/stable/examples/Notebook/Typesetting%20Equations.html

Jupyter Notebook. (n.d.). Retrieved from https://nbformat.readthedocs.io/en/latest/

Navigator, A. (n.d.). *Anaconda Navigator*. Retrieved from https://docs.anaconda.com/anaconda/navigator/

PIP. (n.d.). *PIP*. Retrieved from https://pypi.org/project/pip/

PYPI. (n.d.). *PYPI*. Retrieved from https://pypi.org/

VSCode. (n.d.). Retrieved from https://code.visualstudio.com/docs

INDEX