How to install environment on Windows?

Instructor: Dr. Ha Viet Uyen Synh.

Software: Python ≥ 3.6 and other libraries including Numpy, Matplotlib, Pillow, OpenCV, TensorFlow. All implementation is recommended on PyCharm or Jupyter Notebook

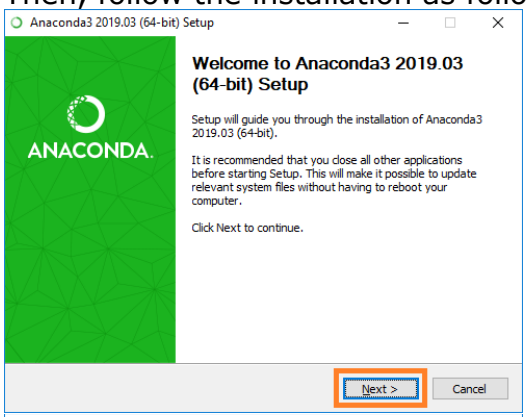
This section aims provide an instruction of Python installation on Windows, which covers 05 parts:

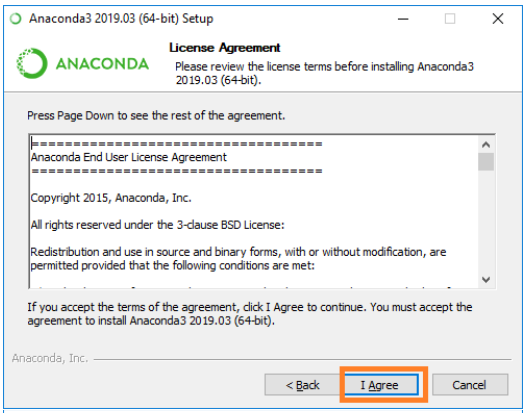
1. Anaconda installation
2. Python-supported library install via pip and conda
3. Pycharm installation and configuration
4. Jupyter installation and configuration
5. Get ready and start your first program !!

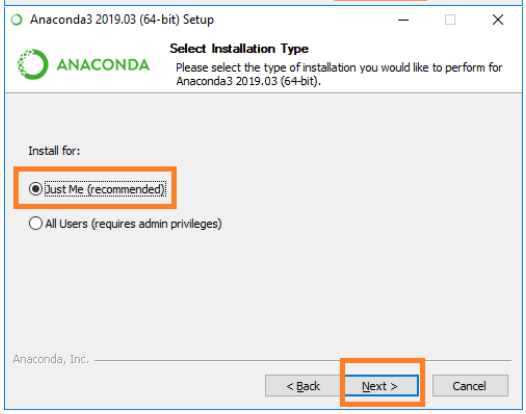
01. Anaconda installation

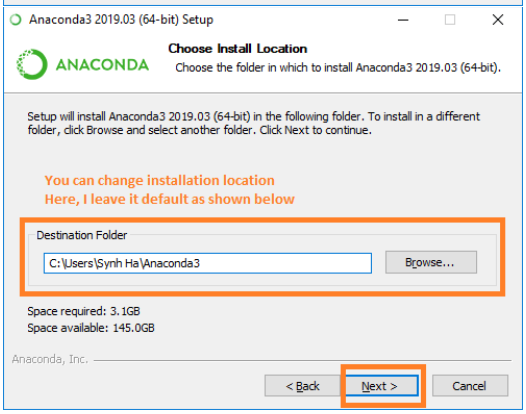
Download the lastest version of Anaconda at
https://www.anaconda.com/distribution/#download-section

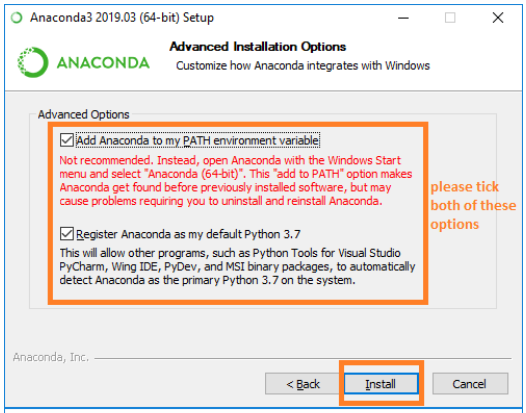
Then, follow the installation as follow:

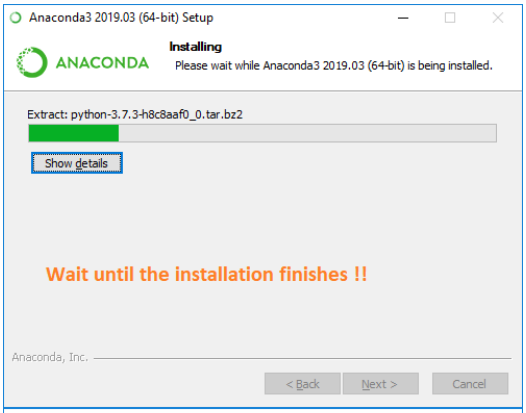


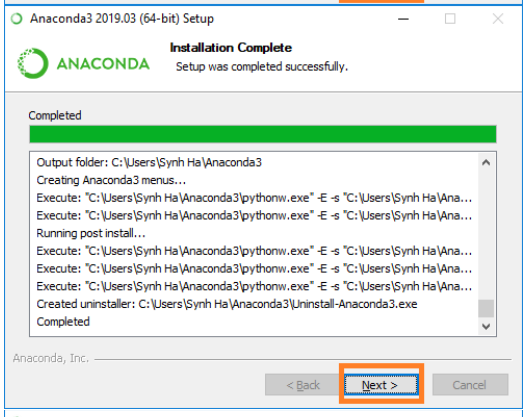


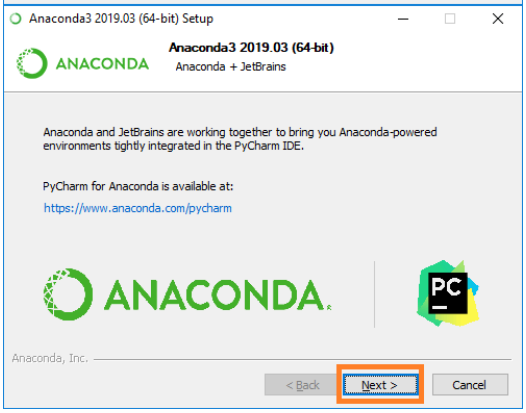


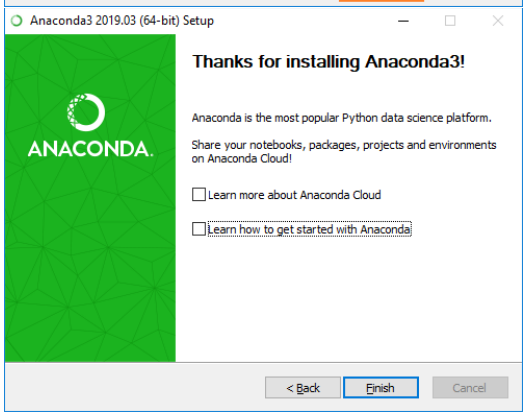




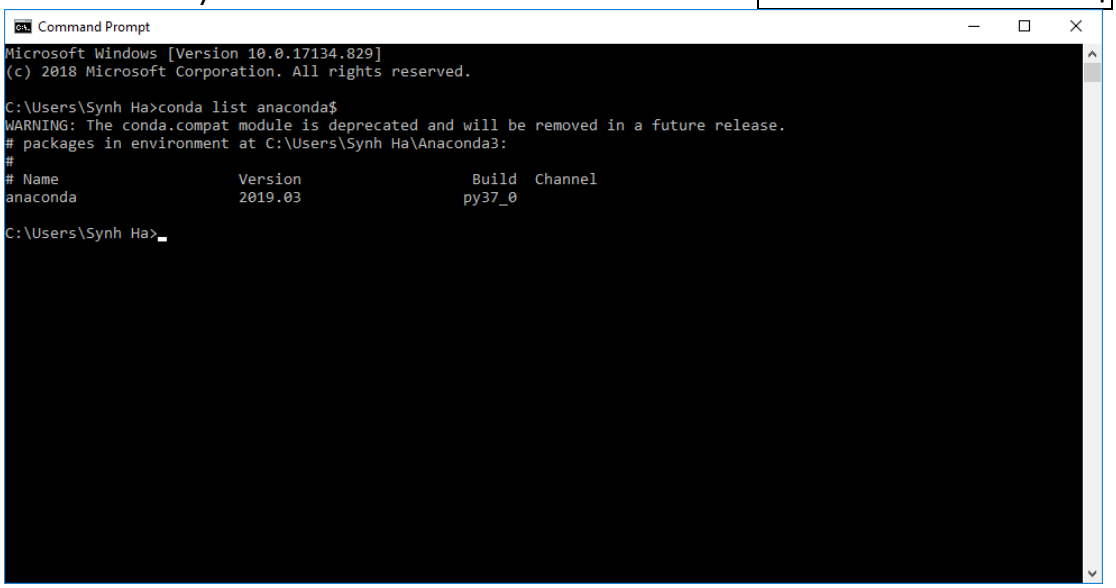








You can verify the installation with this command: `conda list anaconda$`



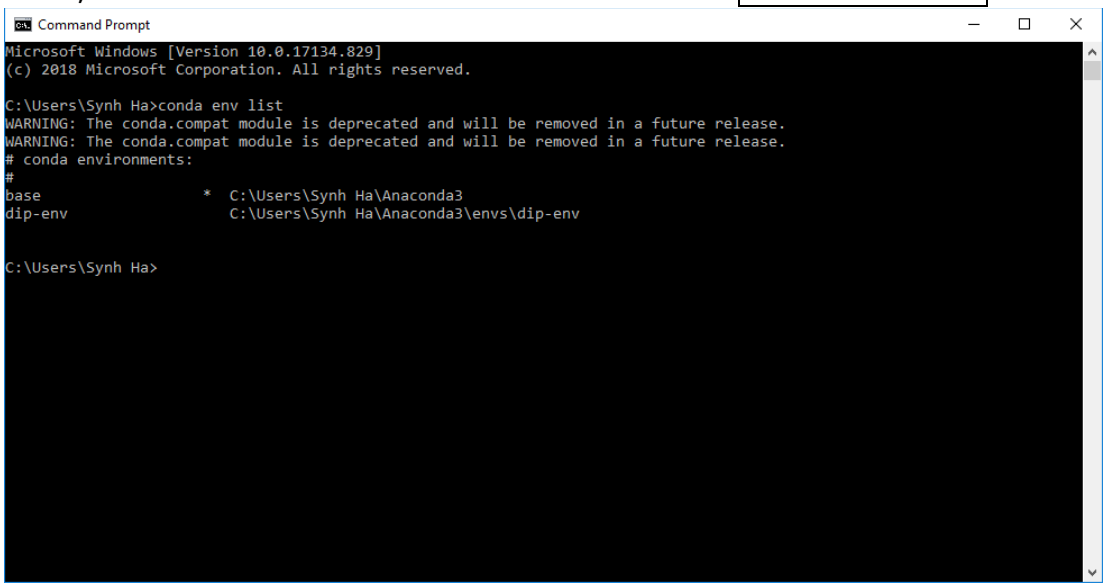
02. Python-supported library install via pip and conda

First we will create a new environment to install necessary packages on it. I assume to create an environment with name `dip-env` with python version 3.6

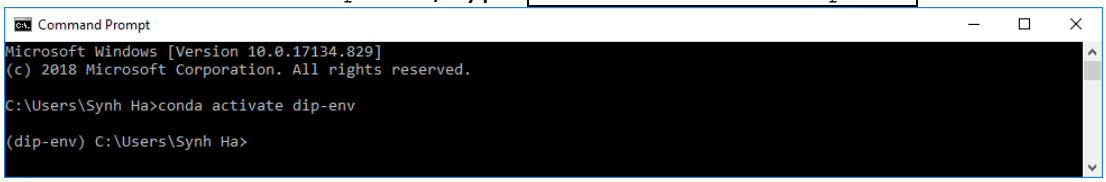
```
conda create --name dip-env python=3.6
```

Type `y` for confirmation to install basic packages

Then, we can confirm created environments with `conda env list`



To use environment `dip-env`, type `conda activate dip-env`



In this course, we will perform image processing techniques with a variety of libraries. You can start installing packages from PyPI:

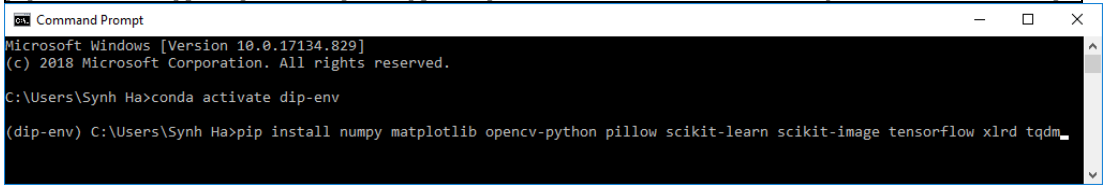
```
pip install package-name
```

or To install a specific version of a package instead of the latest version:

```
pip install package-name==1.0.0
```

Here we install numpy, matplotlib, opencv, pillow, scikit-learn, scikit-image, tensorflow, xlrd, tqdm

```
pip install numpy matplotlib opencv-python pillow scikit-learn scikit-image tensorflow xlrd tqdm
```



Digital Image Processing

Then, we can verify installed package with `conda list`

Command Prompt

```
(dip-env) C:\Users\Synh Ha>conda list
WARNING: The conda.compat module is deprecated and will be removed in a future release.
# packages in environment at C:\Users\Synh Ha\Anaconda3\envs\dip-env:
#
# Name                    Version                   Build  Channel
absl-py                   0.7.1                     pypi_0    pypi
astor                     0.8.0                     pypi_0    pypi
certifi                   2019.6.16                 py36_0
cycler                    0.10.0                    pypi_0    pypi
decorator                 4.4.0                     pypi_0    pypi
gast                      0.2.2                     pypi_0    pypi
google-pasta              0.1.7                     pypi_0    pypi
grpcio                    1.21.1                    pypi_0    pypi
h5py                      2.9.0                     pypi_0    pypi
imageio                   2.5.0                     pypi_0    pypi
joblib                    0.13.2                    pypi_0    pypi
keras-applications        1.0.8                     pypi_0    pypi
keras-preprocessing       1.1.0                     pypi_0    pypi
kiwisolver                1.1.0                     pypi_0    pypi
markdown                  3.1.1                     pypi_0    pypi
matplotlib                3.1.0                     pypi_0    pypi
networkx                  2.3                       pypi_0    pypi
numpy                     1.16.4                    pypi_0    pypi
opencv-python             4.1.0.25                  pypi_0    pypi
pillow                    6.0.0                     pypi_0    pypi
pip                       19.1.1                    py36_0
protobuf                  3.8.0                     pypi_0    pypi
pyparsing                 2.4.0                     pypi_0    pypi
python                    3.6.8                h9f7ef89_7
python-dateutil           2.8.0                     pypi_0    pypi
pywavelets                1.0.3                     pypi_0    pypi
scikit-image              0.15.0                    pypi_0    pypi
scikit-learn              0.21.2                    pypi_0    pypi
scipy                     1.3.0                     pypi_0    pypi
setuptools                41.0.1                    py36_0
six                       1.12.0                    pypi_0    pypi
sqlite                    3.28.0               he774522_0
tensorboard               1.14.0                    pypi_0    pypi
tensorflow                1.14.0                    pypi_0    pypi
tensorflow-estimator      1.14.0                    pypi_0    pypi
termcolor                 1.1.0                     pypi_0    pypi
tqdm                      4.32.2                    pypi_0    pypi
vc                        14.1                 h0510ff6_4
vs2015_runtime            14.15.26706          h3a45250_4
werkzeug                  0.15.4                    pypi_0    pypi
wheel                     0.33.4                    py36_0
wincertstore              0.2              py36h7fe50ca_0
wrapt                     1.11.2                    pypi_0    pypi
xlrd                      1.2.0                     pypi_0    pypi

(dip-env) C:\Users\Synh Ha>
```

Or we can verify installed package with `pip list`

Command Prompt

```
(dip-env) C:\Users\Synh Ha>pip list
Package              Version
-------------------- ---------
absl-py              0.7.1
astor                0.8.0
certifi              2019.6.16
cycler               0.10.0
decorator            4.4.0
gast                 0.2.2
google-pasta         0.1.7
grpcio               1.21.1
h5py                 2.9.0
imageio              2.5.0
joblib               0.13.2
Keras-Applications   1.0.8
Keras-Preprocessing  1.1.0
kiwisolver           1.1.0
Markdown             3.1.1
matplotlib           3.1.0
networkx             2.3
numpy                1.16.4
opencv-python        4.1.0.25
Pillow               6.0.0
pip                  19.1.1
protobuf             3.8.0
pyparsing            2.4.0
python-dateutil      2.8.0
PyWavelets           1.0.3
scikit-image         0.15.0
scikit-learn         0.21.2
scipy                1.3.0
setuptools           41.0.1
six                  1.12.0
tensorboard          1.14.0
tensorflow           1.14.0
tensorflow-estimator 1.14.0
termcolor            1.1.0
tqdm                 4.32.2
Werkzeug             0.15.4
wheel                0.33.4
wincertstore         0.2
wrapt                1.11.2
xlrd                 1.2.0

(dip-env) C:\Users\Synh Ha>
```

03. Pycharm installation and configuration

PyCharm is a cross-platform editor developed by JetBrains. Pycharm provides all the tools you need for productive Python development.

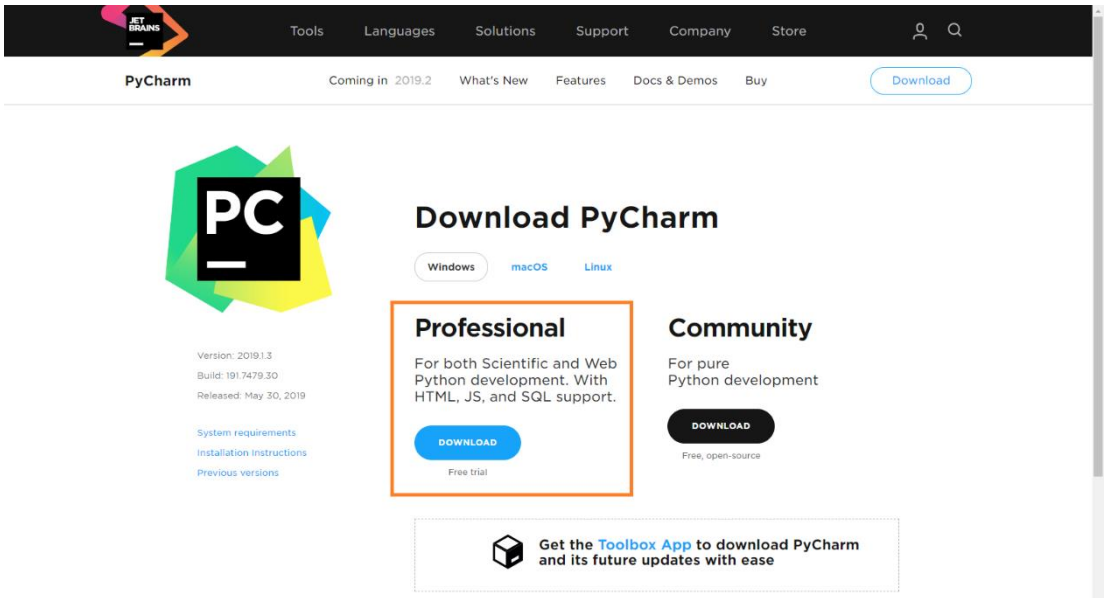
Download lastest version of Pycharm at:

https://www.jetbrains.com/pycharm/download/#section=windows

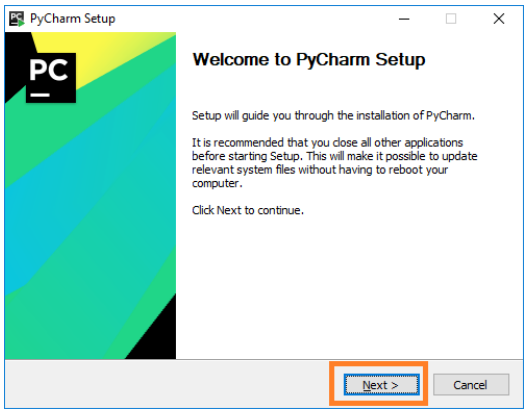
I recommend you download Professional version.

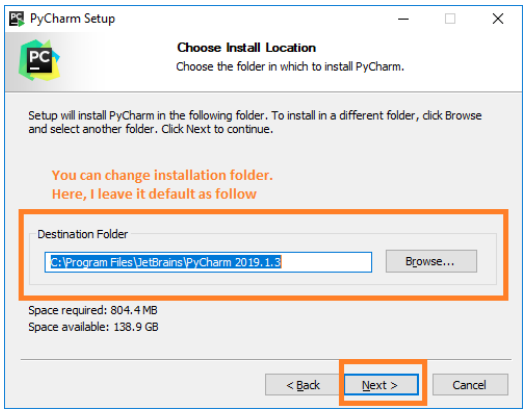
PyCharm is provided with a free one-year license of Professional version for academic at here:

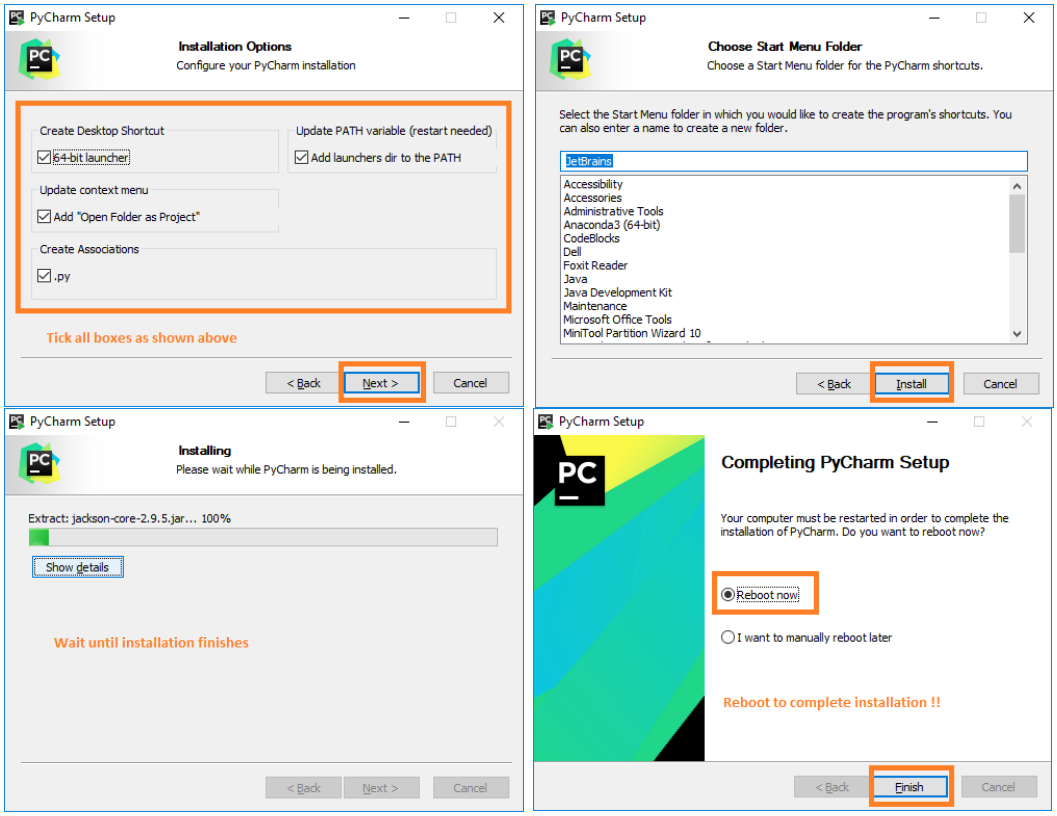
https://www.jetbrains.com/shop/eform/students



Then, follow the installation as follow:

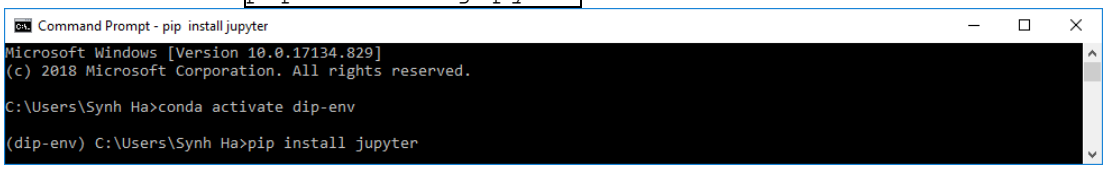






04. Jupyter installation and configuration

We re-select our environment `dip-env` and then install Jupyter-Notebook with command: `pip install jupyter`

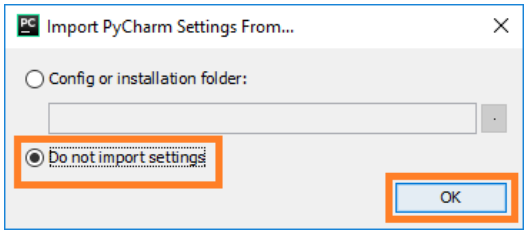


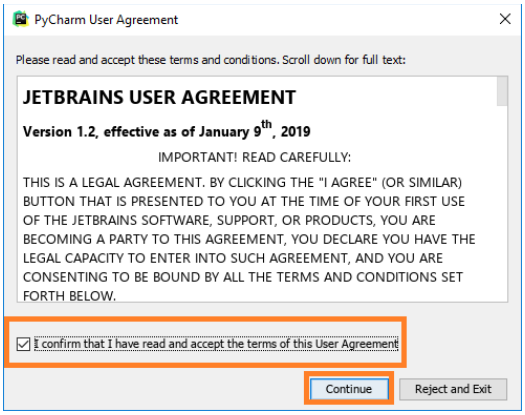
05. Get ready and start your first program

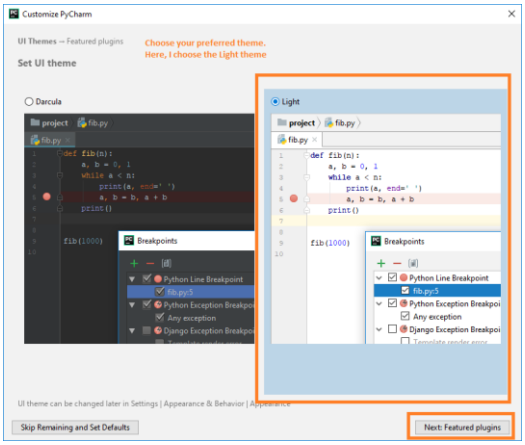
05.01. Implementation on PyCharm

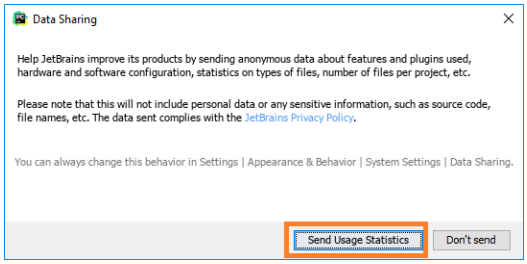
Here, we get started with creating a new PyCharm project.

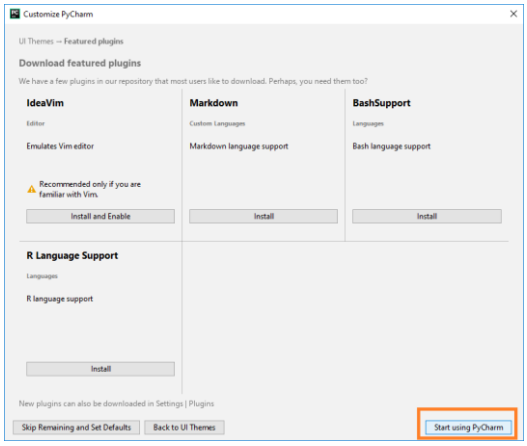
First, let's run PyCharm.



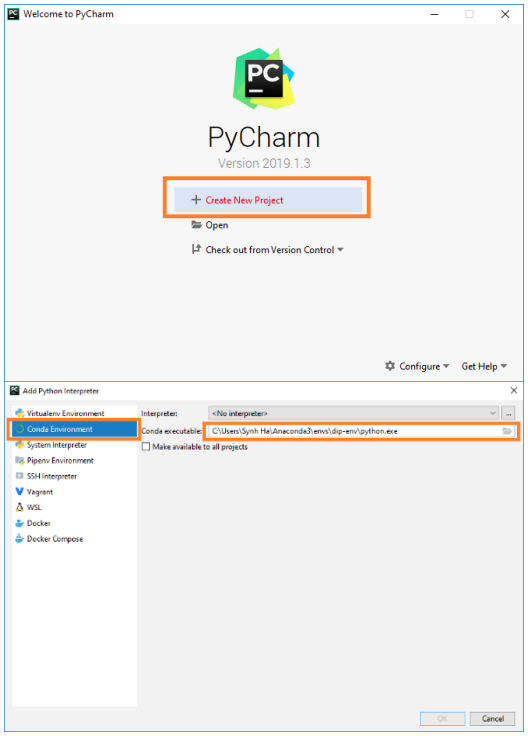


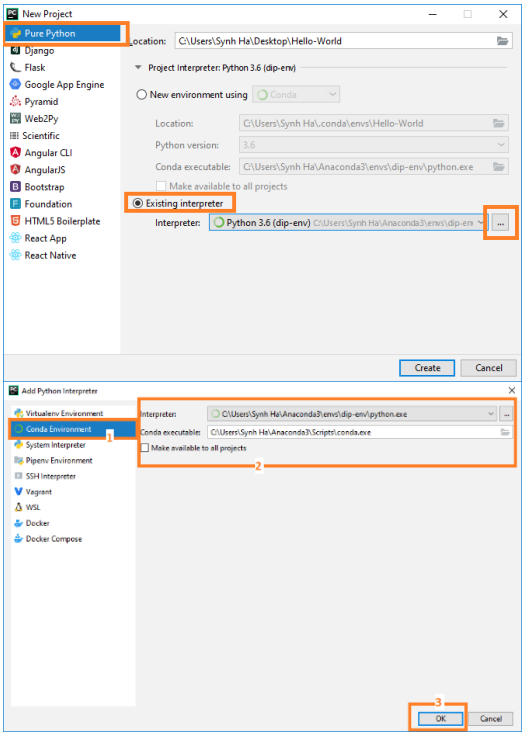


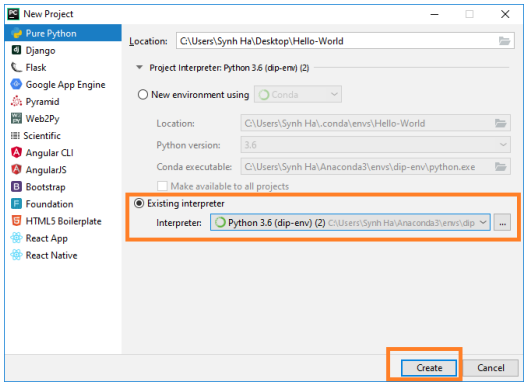


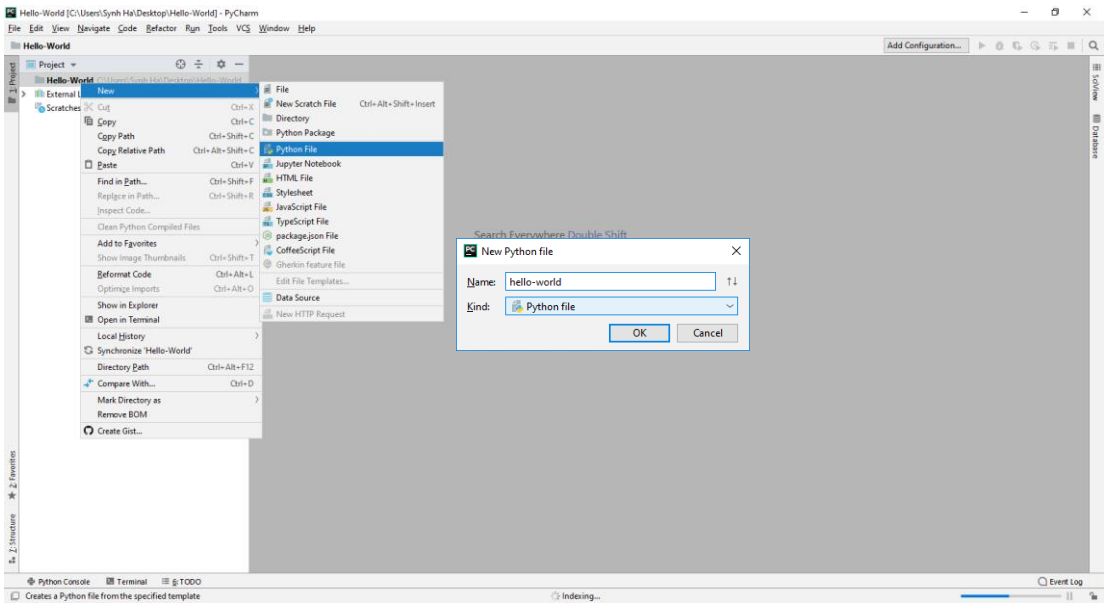


Now, create a new project of PyCharm.

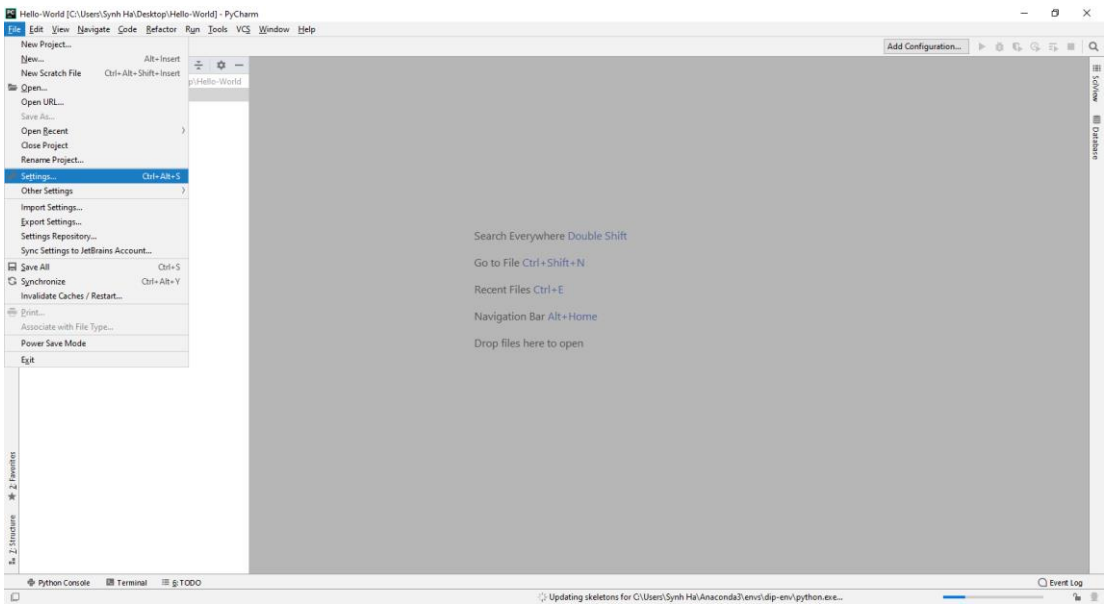


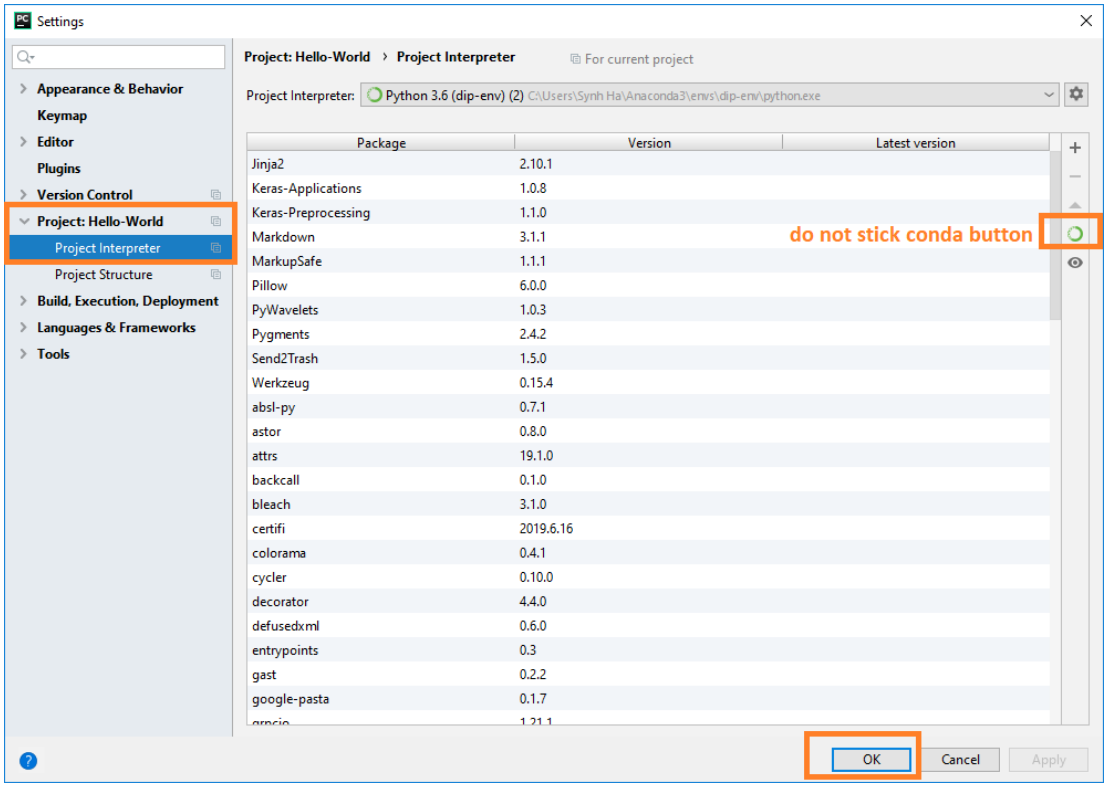






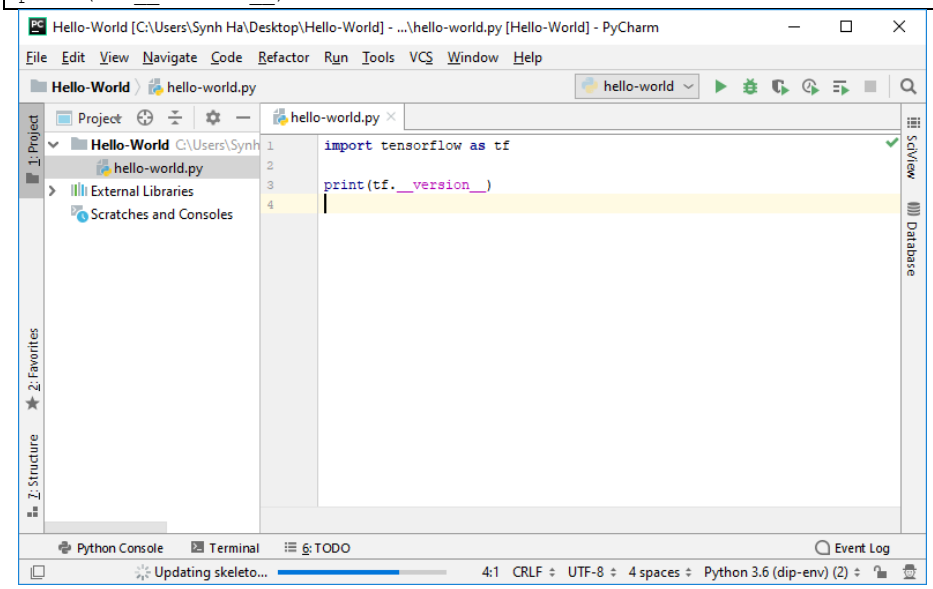
In order to use PIP packages in PyCharm, we must config the interpreter as follows:



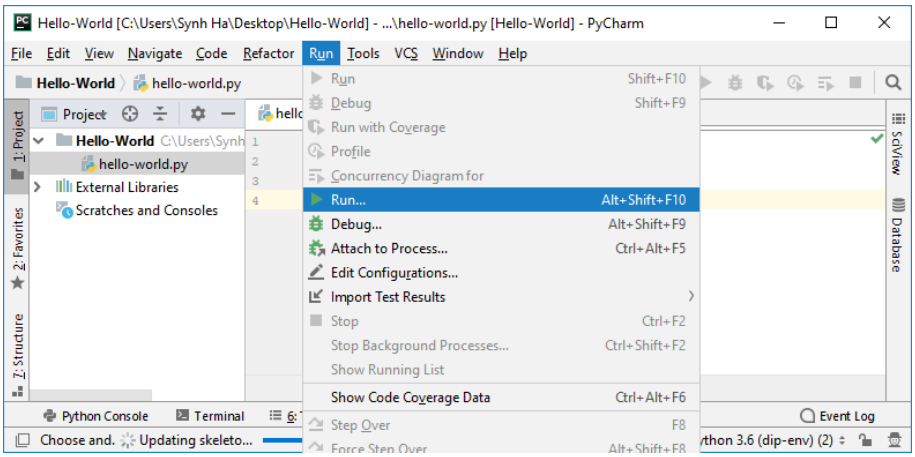


Then insert the below block of code into `hello-world.py`

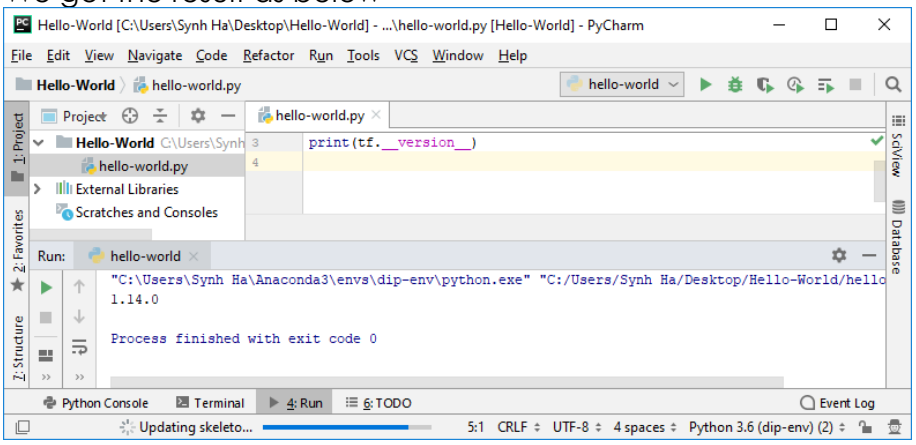
```
import tensorflow as tf
print(tf.__version__)
```



Then run the code

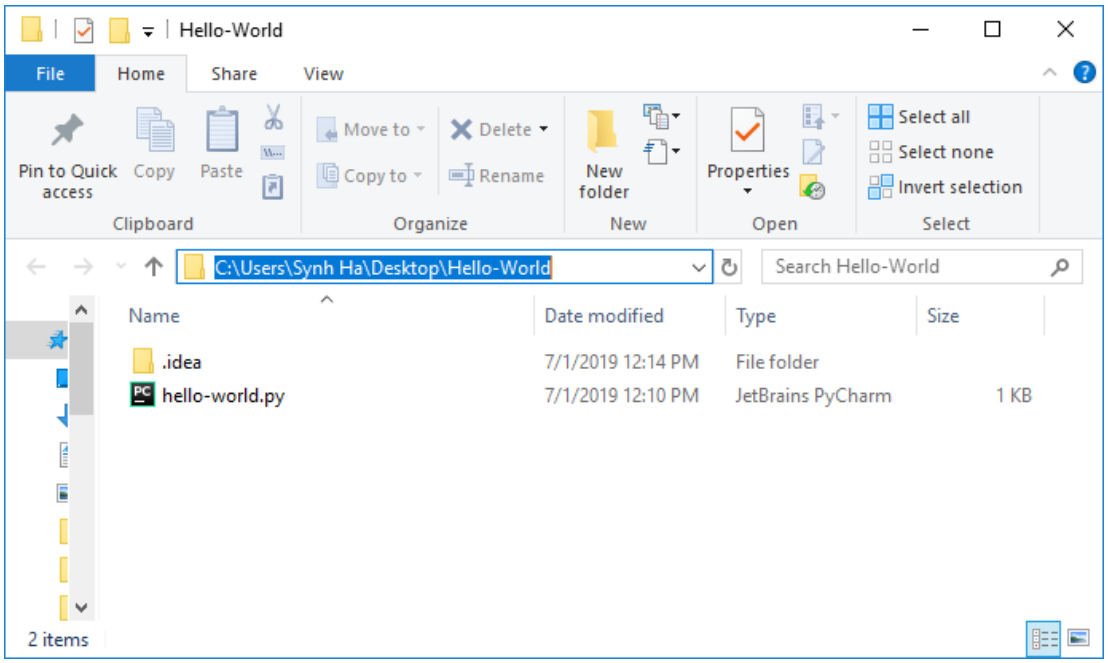


We got the result as below



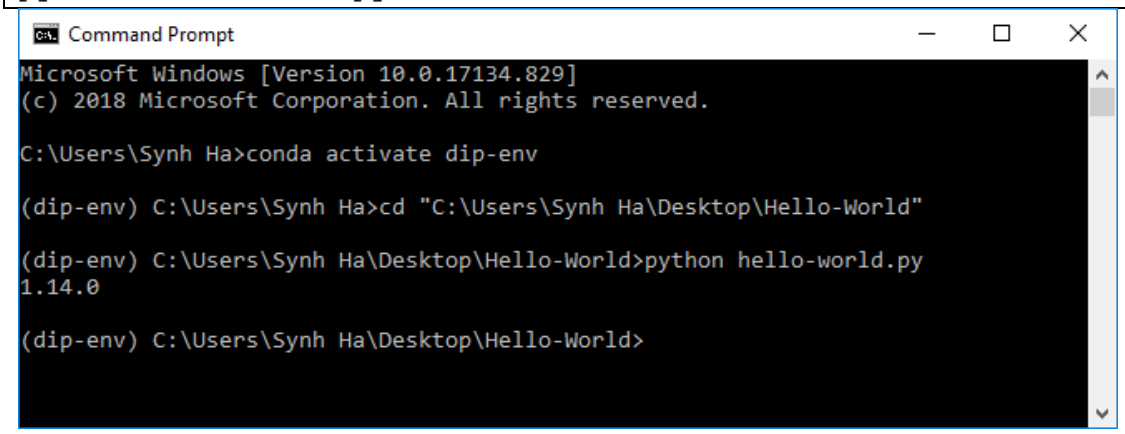
05.02. Run the code on Command Line (CMD)

Here, I suppose my code located `hello-world.py` in folder `C:\Users\Synh Ha\Desktop\Hello-World`



We run the following command on CMD:

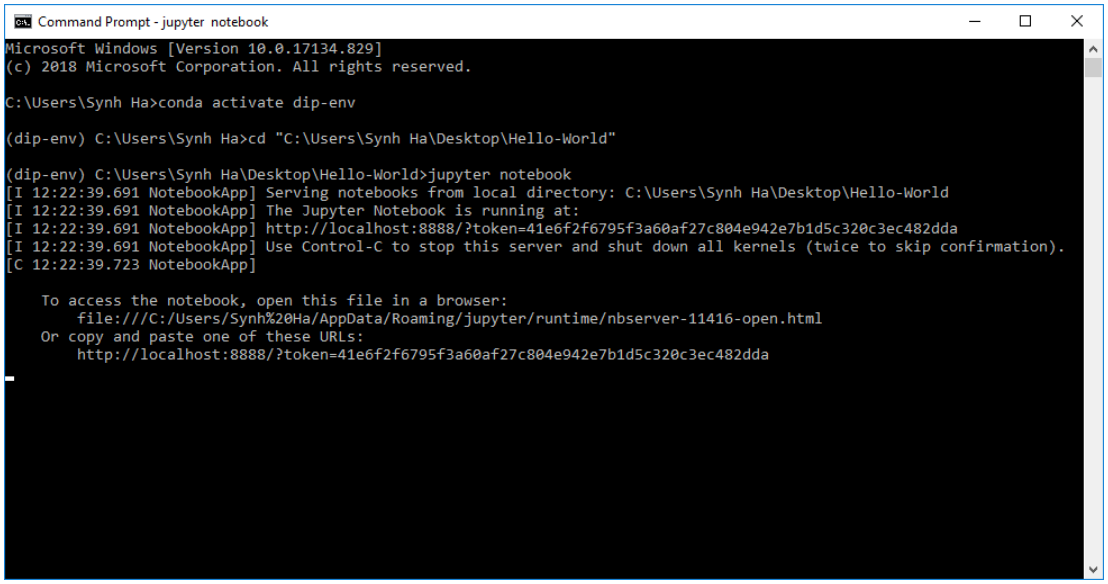
```
conda activate dip-env
cd "C:\Users\Synh Ha\Desktop\Hello-World"
python hello-world.py
```



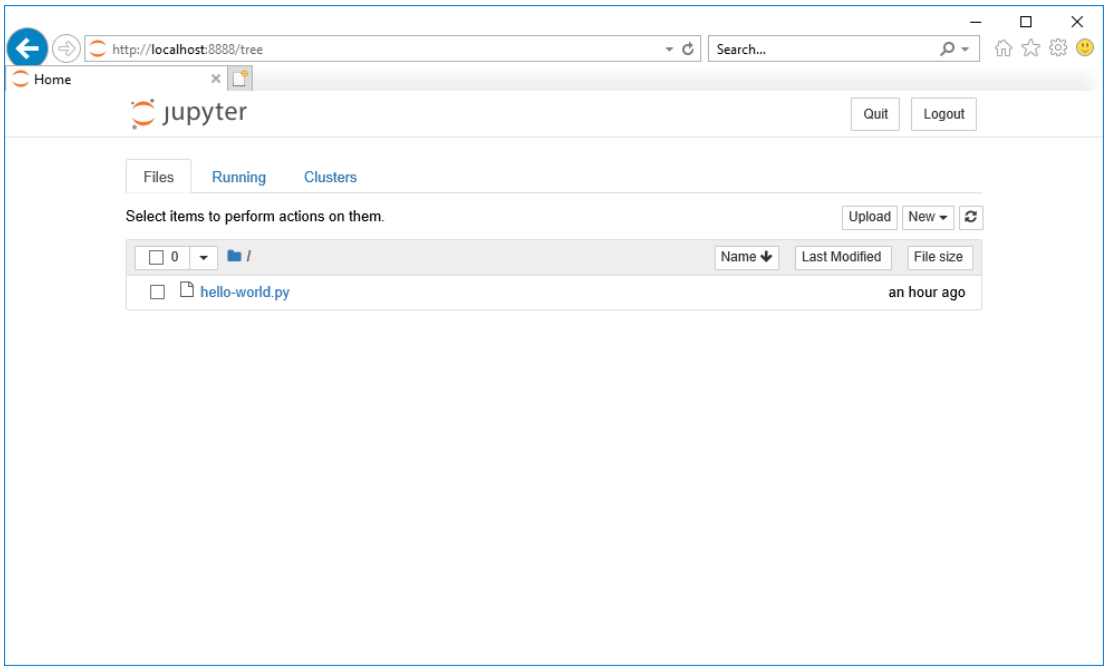
05.03. Run the code on Jupyter Notebook

We run the following command on CMD:

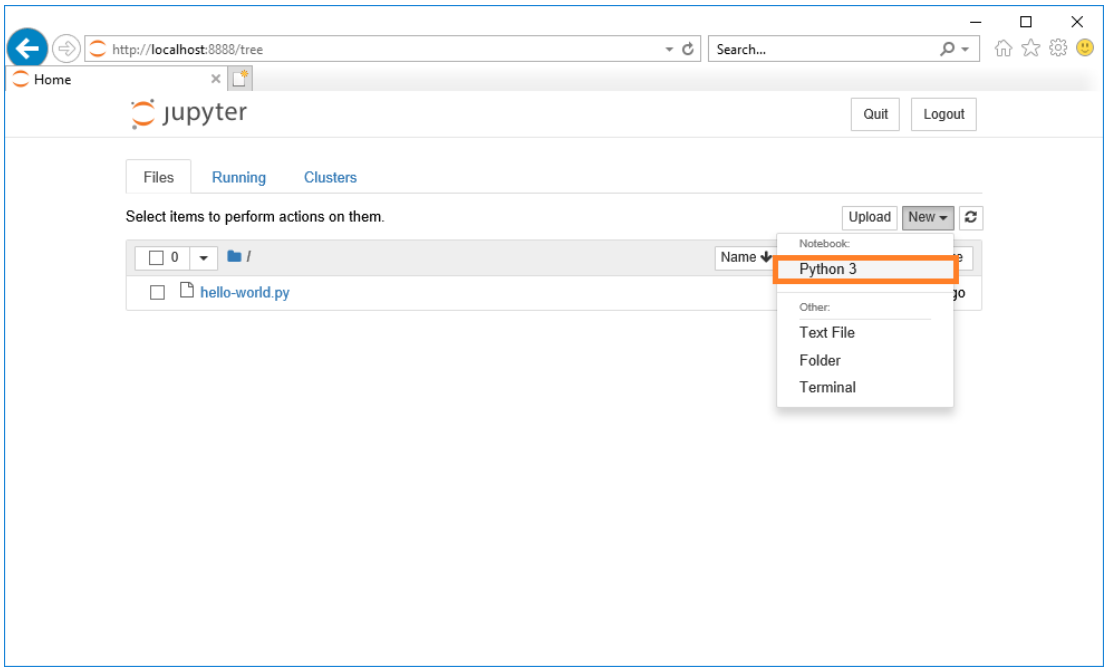
```
conda activate dip-env

cd "C:\Users\Synh Ha\Desktop\Hello-World"

jupyter notebook
```



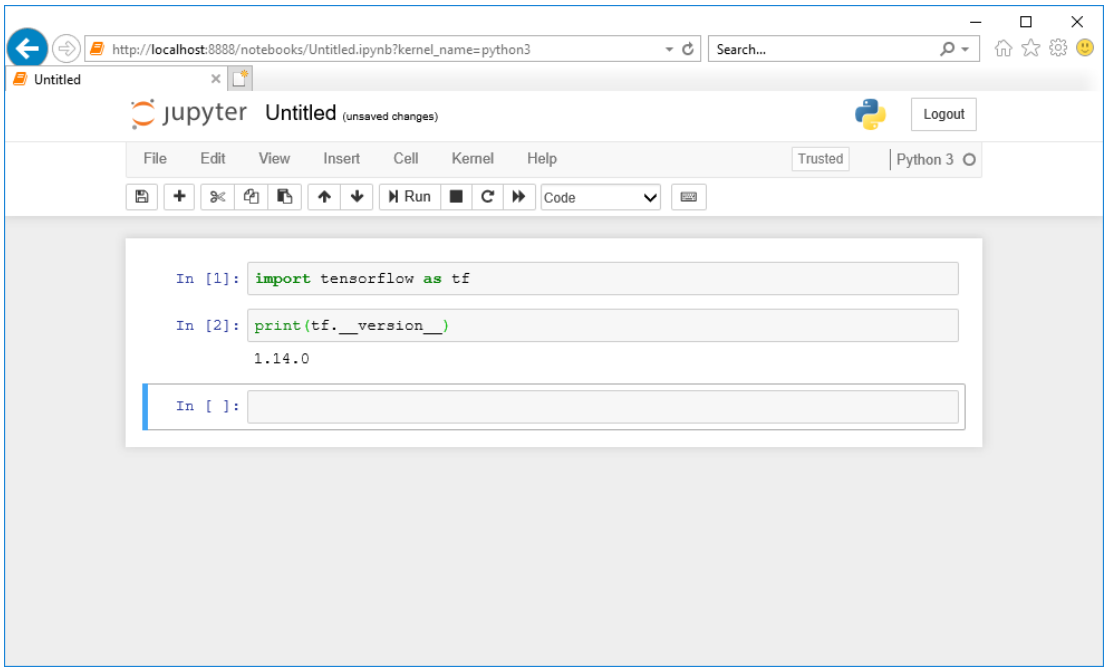
Then, web browser will automatically redirect to jupyter home folder



Now, we create a new notebook with Python 3



We run the code cell-by-cell (Run code hotkey: Shift + Enter)



More information about Jupyter Notebook can be found at:
https://jupyter.org/documentation

05.04. Run the code on Google Colab (a referenced part)

Google provided a free cloud service and now it supports free GPU where you can perform Python programming exactly the same as on Jupyter Notebook. More information about Google Colab can be found at:
https://colab.research.google.com/