➢ Experiment No. - 1

Installation of Tensorflow & Keras (Tensorflow (v1.0.0), TFLearn, Keras, and many other pre-installed python libraries (Numpy, pandas)

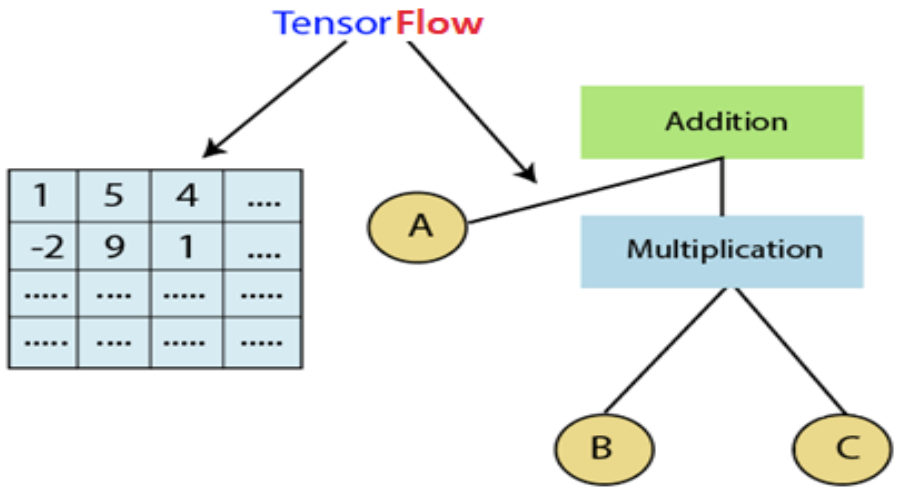
➢ Tensorflow

• What is TensorFlow?

The word TensorFlow is made by two words, i.e., Tensor and Flow

1. **Tensor** is a multidimensional array
2. **Flow** is used to define the flow of data in operation.

TensorFlow is used to define the flow of data in operation on a multidimensional array or Tensor.



1) **TensorFlow** is a popular framework of **machine learning** and **deep learning**. It is **a free** and **open-source** library which is released on **9 November 2015** and developed by **Google Brain Team**.
2) It is entirely based on Python programming language and use for numerical computation and data flow, which makes machine learning faster and easier.
3) TensorFlow can train and run the deep neural networks for image recognition, handwritten digit classification, recurrent neural network, **word embedding**, **natural language processing**, video detection, and many more.
4) TensorFlow is run on multiple **CPU**s or **GPU**s and also mobile operating systems.

• How To install TensorFlow ?

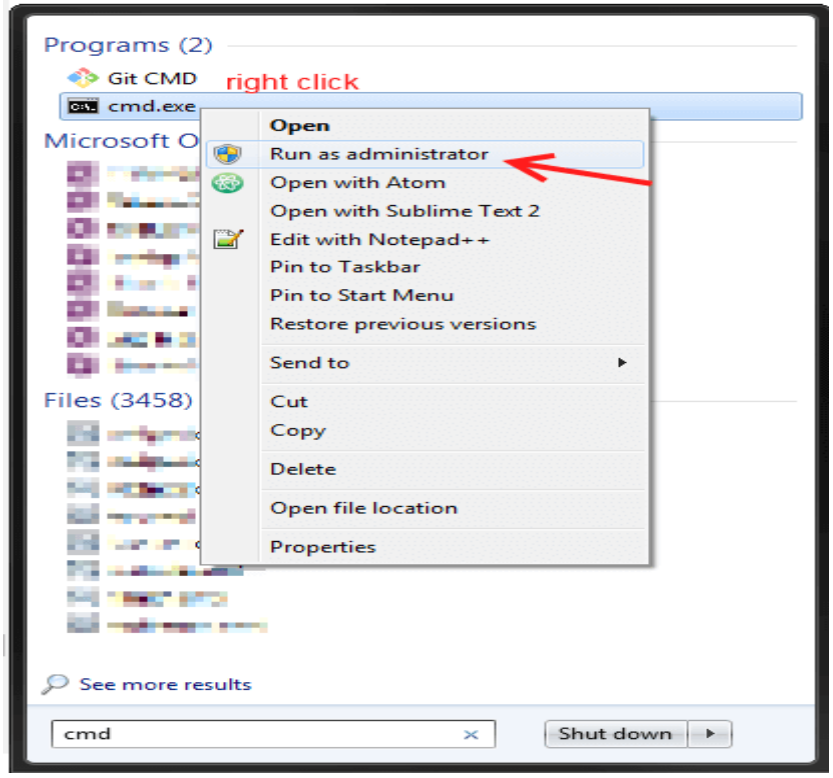
We can download TensorFlow in our system in 2 ways:

1. Through pip (Python package library)
2. Through Anaconda Navigator (conda)

1. Through pip

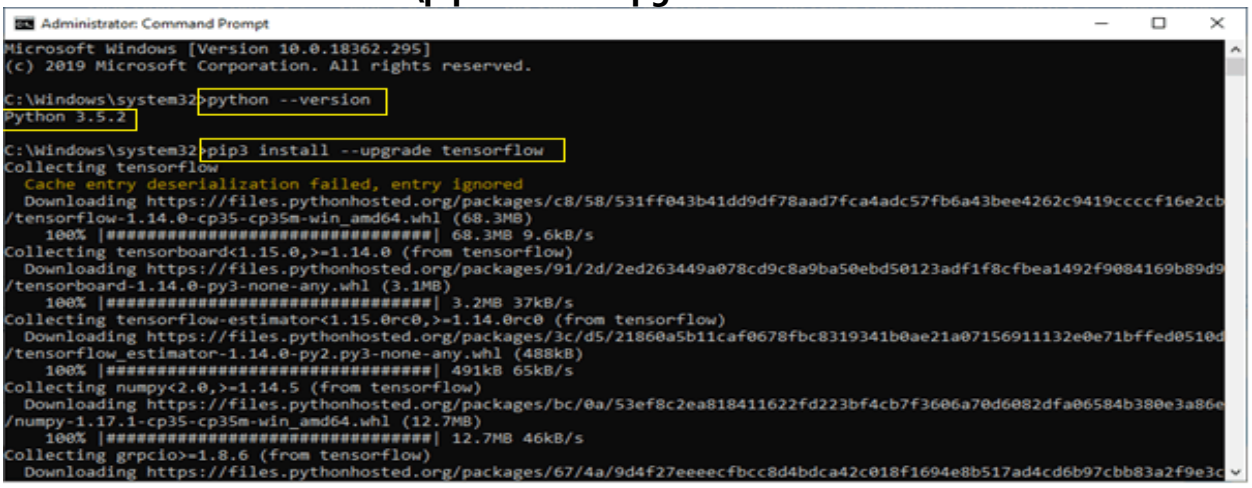
- **pip** is known as a **package management system** which is used to install and manage the software package, which is written in Python or any other languages.
- pip is used to download, search, install, uninstall, and manage the 3rd party python package
-

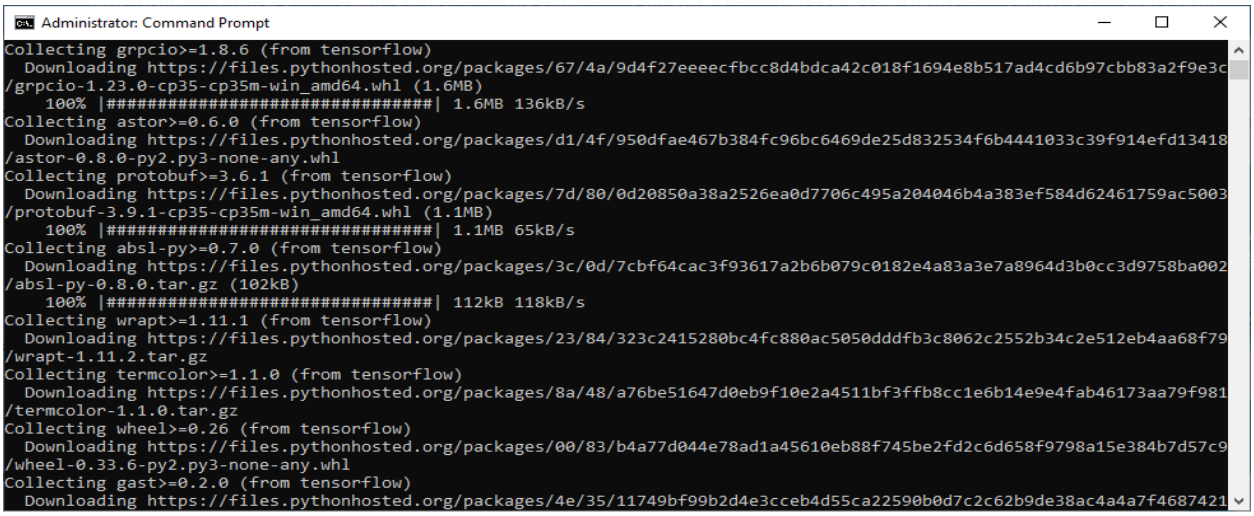
Step 1: To install TensorFlow, start the terminal. Make sure that we run the cmd as an administrator.

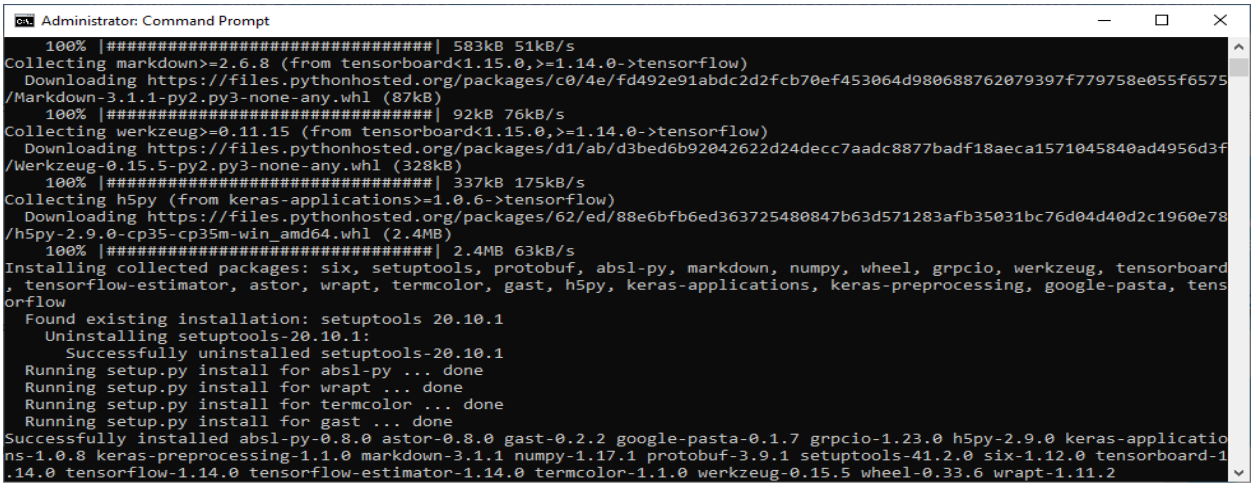


Step 2: Once we are done with that, then we have to write the command in **command prompt** for finish installing Tensorflow in our Windows.

- Enter this command: **C:\pip3 install -upgrade tensorflow**







```
In [2]: pip install tensorflow

Requirement already satisfied: tensorflow in c:\users\jagannath\anaconda3\lib\site-packages (2.12.0)
Requirement already satisfied: tensorflow-intel==2.12.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow) (2.
12.0)
Requirement already satisfied: numpy<1.24,>=1.22 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.1
2.0->tensorflow) (1.23.5)
Requirement already satisfied: typing-extensions>=3.6.6 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-inte
l==2.12.0->tensorflow) (4.4.0)
Requirement already satisfied: tensorflow-estimator<2.13,>=2.12.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tenso
rflow-intel==2.12.0->tensorflow) (2.12.0)
Requirement already satisfied: wrapt<1.15,>=1.11.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.
12.0->tensorflow) (1.14.1)
Requirement already satisfied: libclang>=13.0.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.12.
0->tensorflow) (16.0.0)
Requirement already satisfied: gast<=0.4.0,>=0.2.1 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.
12.0->tensorflow) (0.4.0)
Requirement already satisfied: termcolor>=1.1.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.12.
0->tensorflow) (2.3.0)
Requirement already satisfied: opt-einsum>=2.3.2 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.1
2.0->tensorflow) (3.3.0)
Requirement already satisfied: h5py>=2.9.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.12.0->te
nsorflow) (3.7.0)
Requirement already satisfied: google-pasta>=0.1.1 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.
12.0->tensorflow) (0.2.0)
Requirement already satisfied: flatbuffers>=2.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.12.
0->tensorflow) (23.5.26)
Requirement already satisfied: keras<2.13,>=2.12.0 in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.
12.0->tensorflow) (2.12.0)
Requirement already satisfied: setuptools in c:\users\jagannath\anaconda3\lib\site-packages (from tensorflow-intel==2.12.0->ten
```

To check the version of TensorFlow installed in your environment, you can use Python. Here are a few ways to do this:

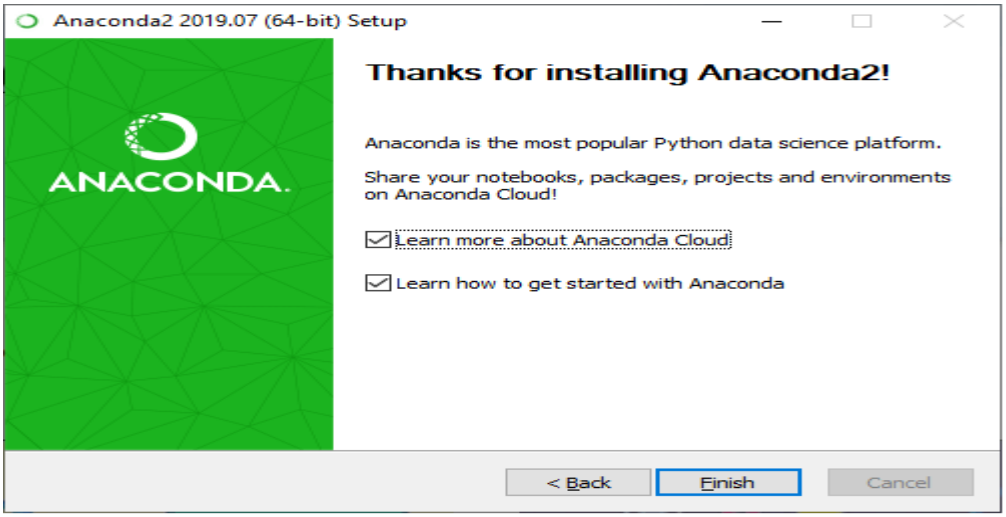
```
In [1]: import tensorflow as tf
        print(tf.__version__)

        2.12.0
```

TensorFlow is successfully working now.

2) Installation of TensorFlow through conda

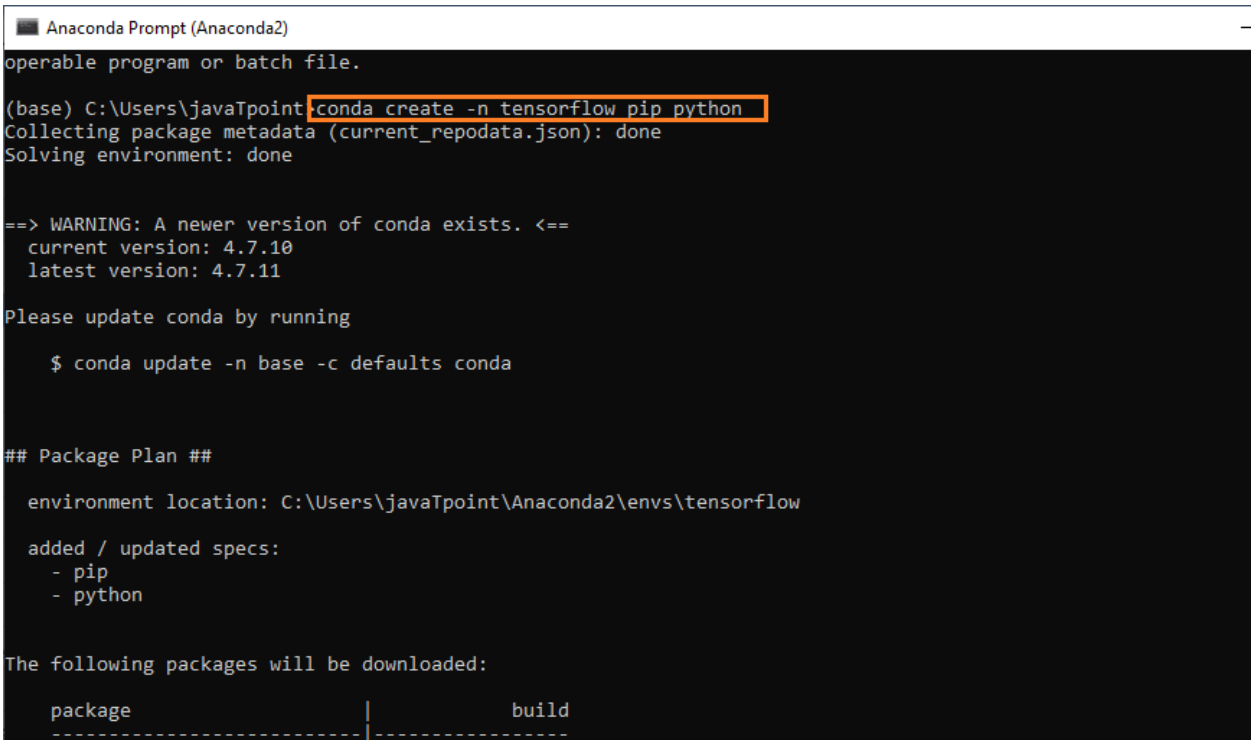
1) install Anaconda

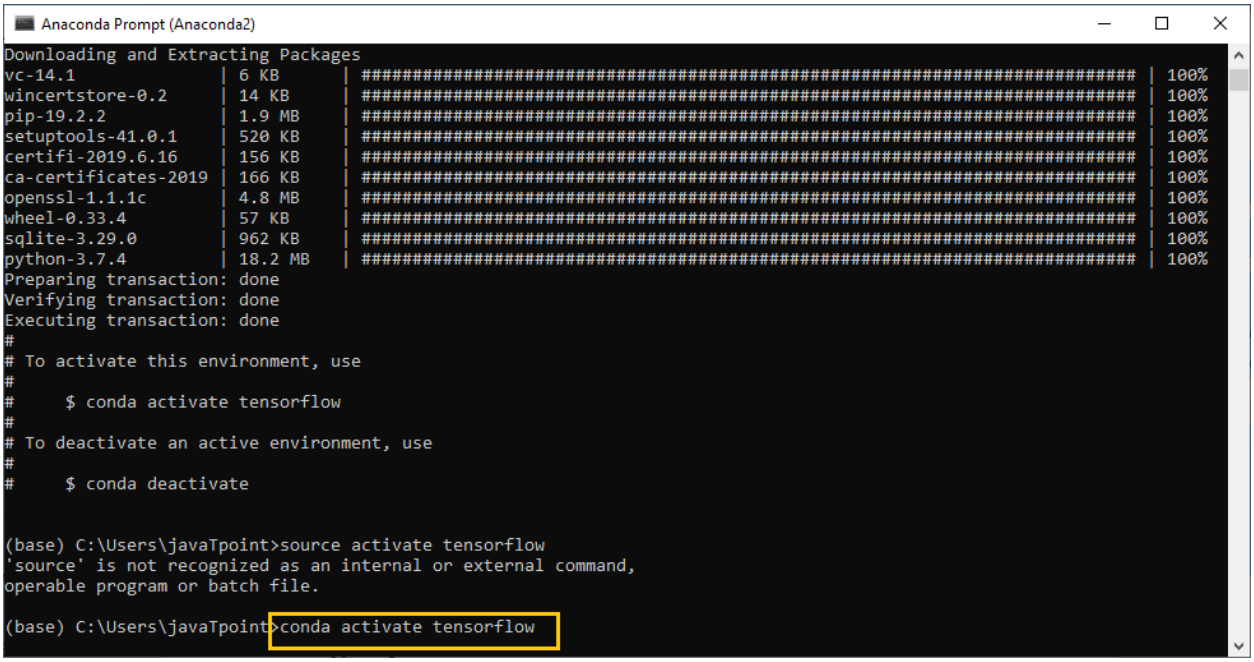


2) Open Anaconda Prompt

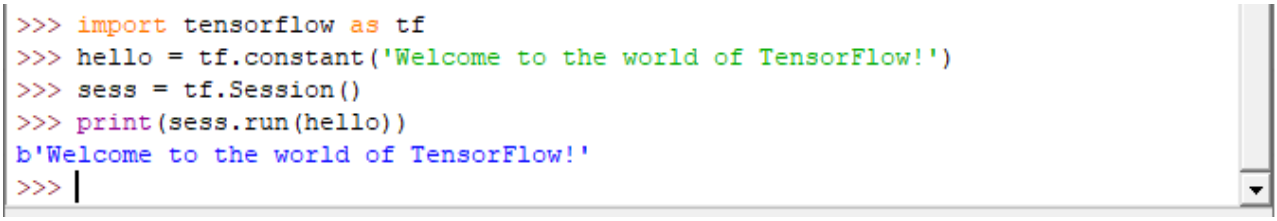
run the given command to set-up the TensorFlow and libraries.

Conda create -n tensorflow pip python.





After that, we have to check that TensorFlow is working or not in our system.

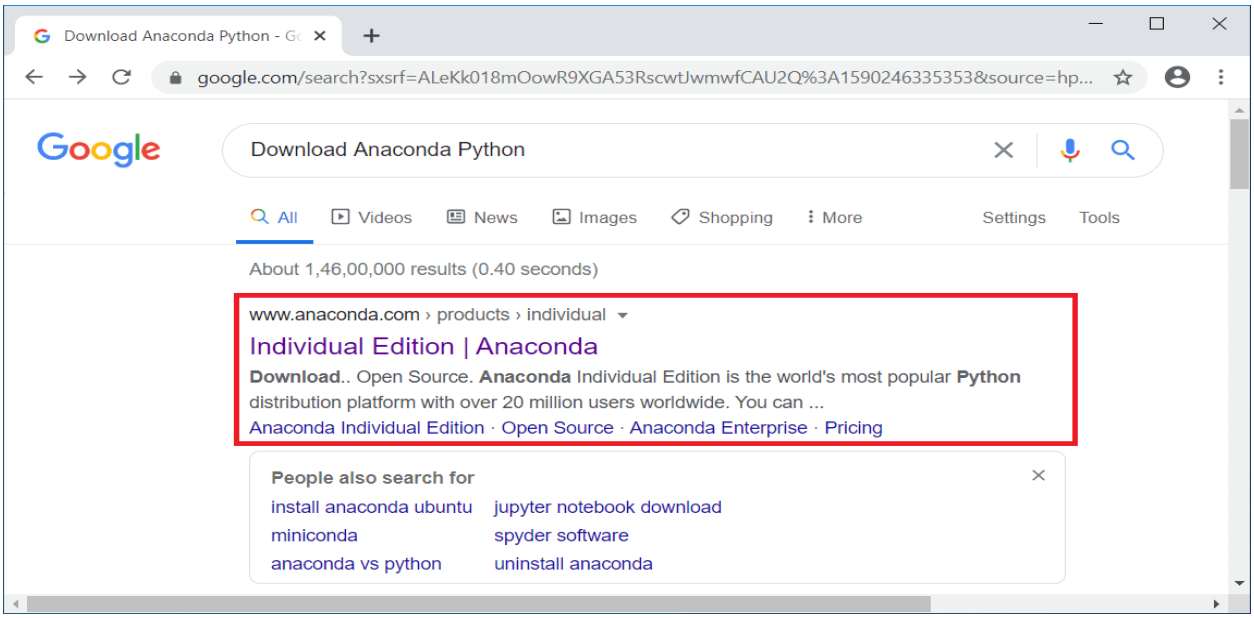


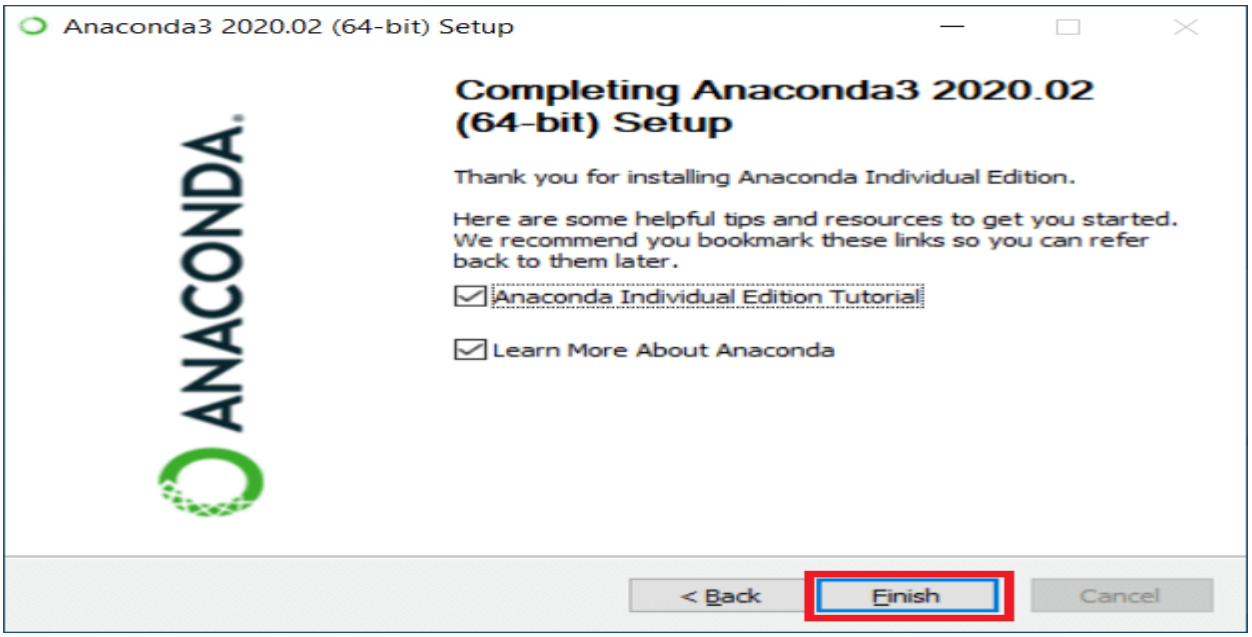
So, according to the above screenshot, TensorFlow is successfully working in our system.

• Installation of Keras library in Anaconda

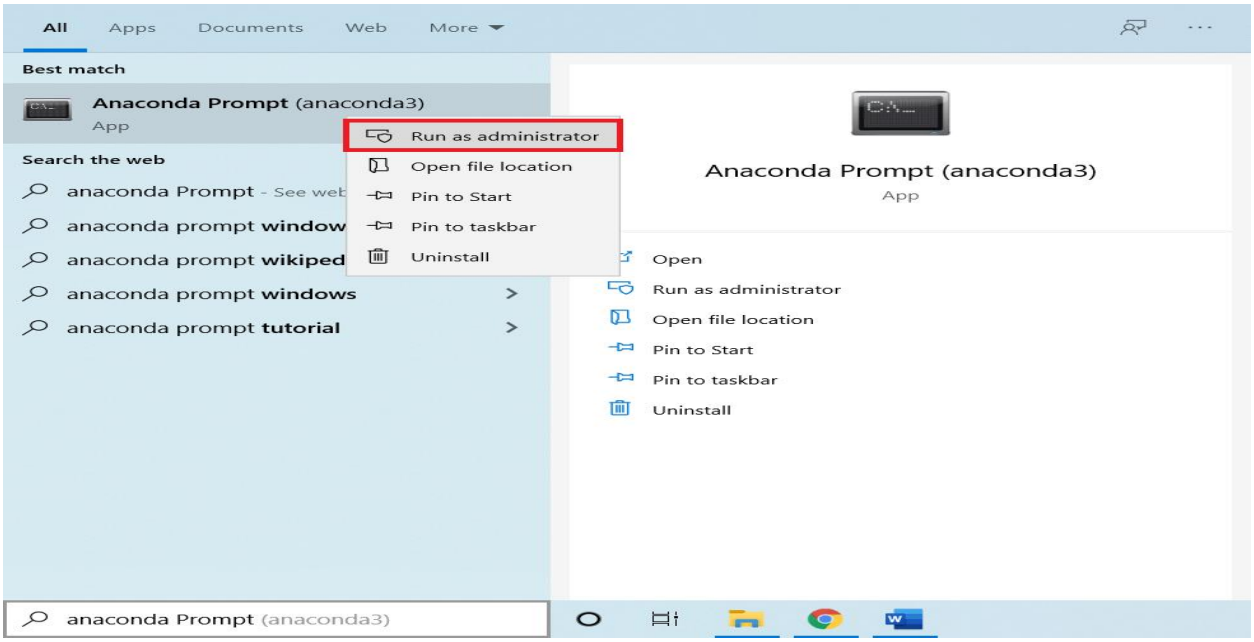
Step1: Download Anaconda Python

To download Anaconda, you can either go to one of your favorite browser and type **Download Anaconda Python** in the search bar or, simply follow the link given below.

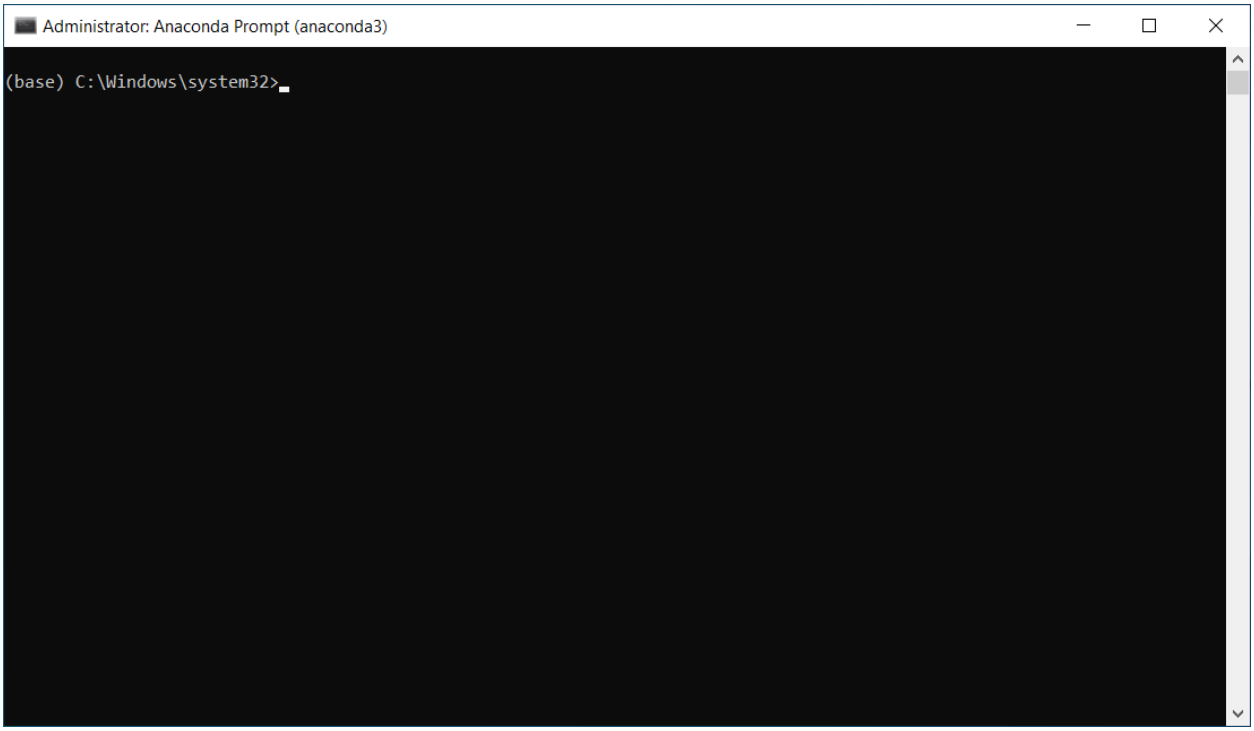




Step3: Create Environment



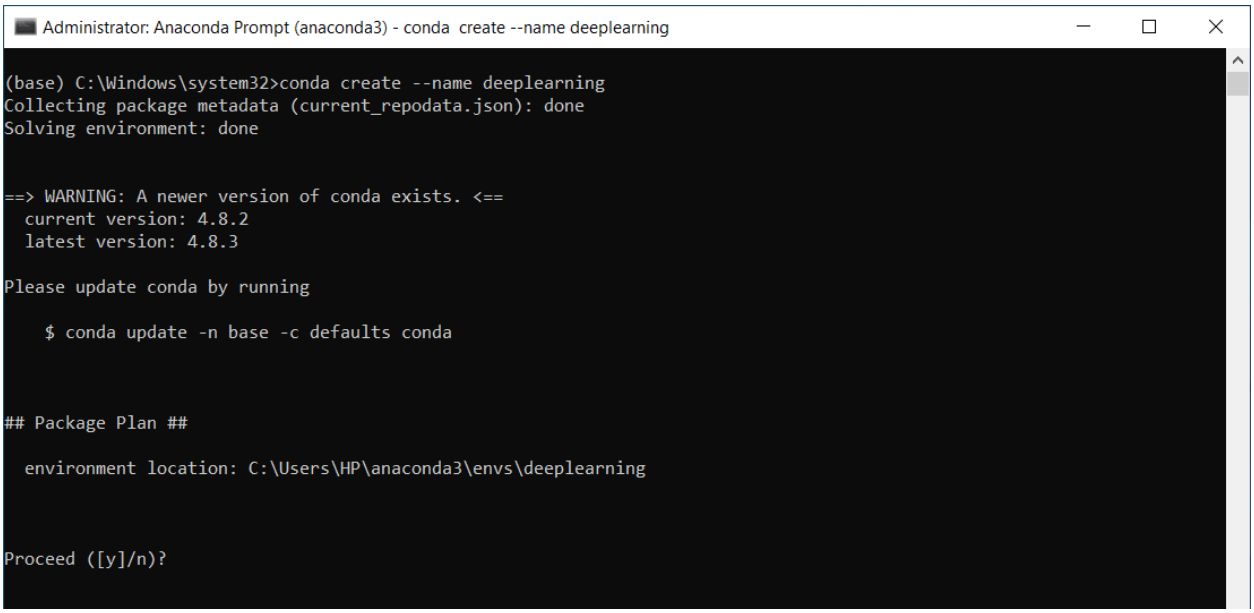
After you click on it, you will see that your anaconda prompt has opened, and it will look like the image given below.



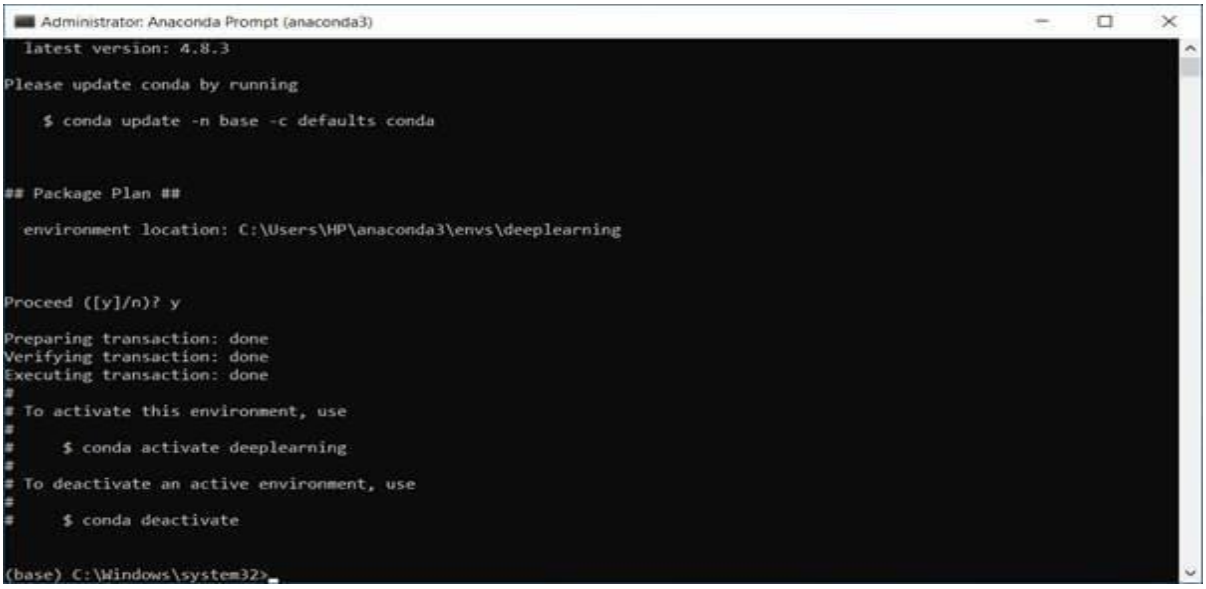
write the following command on the anaconda prompt and press enter

deeplearning specifies to the name of the environment, but you can write anything as per your choice.

➔ conda create --name deeplearning

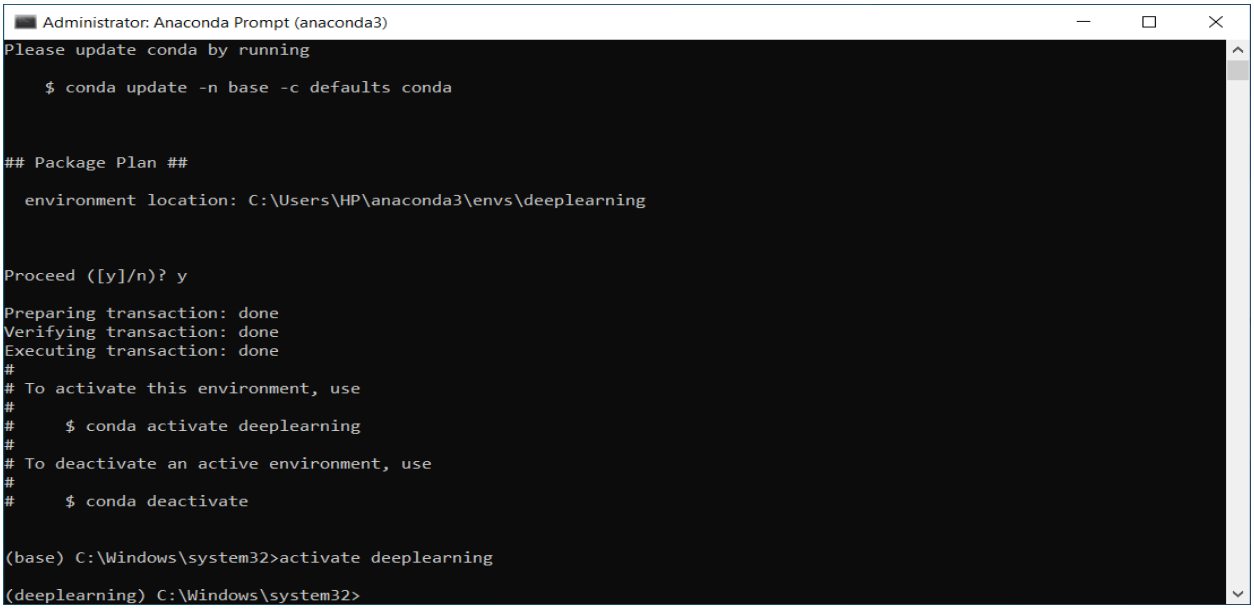


click on y and press enter.

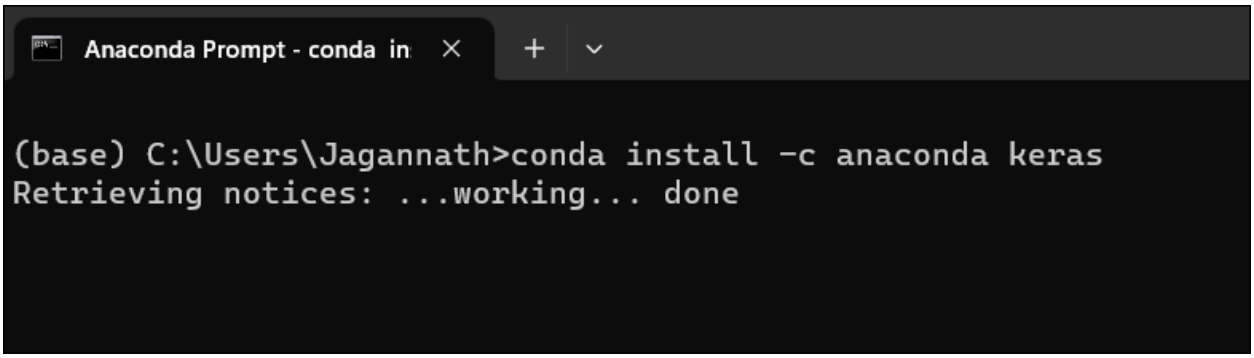


next step is to activate the environment that you created earlier. To activate the environment, write the following;

- activate deeplearning



conda install -c anaconda keras



3) NumPy

• What is Numpy

1] NumPy is a Python library.

2] NumPy is used for working with arrays.

3] NumPy is short for "Numerical Python".

• Installation of NumPy

If you have Python and PIP already installed on a system, then installation of NumPy is very easy.

Install it using this command:

```
C:\Users\GouravKumbhar>pip install numpy
```

If this command fails, then use a python distribution that already has NumPy installed like, Anaconda, Spyder etc.

Numpy installed or not cheacking

```
In [10]: import numpy as np
         print("numpy version is: ",np.__version__)

         numpy version is:  1.23.5

In [ ]:
```

4) Pandas

• What is Pandas?

Pandas is a Python library used for working with data sets.

It has functions for analyzing, cleaning, exploring, and manipulating data.

The name "Pandas" has a reference to both "Panel Data", and "Python Data Analysis"

• Installation of Pandas

If you have Python and PIP already installed on a system, then installation of Pandas is very easy.

Install it using this command:

```
C:\Users\GouravKumbhar>pip install pandas
```

Import Pandas

Once Pandas is installed, import it in your applications by adding the `import` keyword: `import pandas`

Now Pandas is imported and ready to use.

Pandas installed or not cheacking

```
In [8]: import pandas as pd
        print("pandas version is: ",pd.__version__)

        pandas version is:  1.5.3

In [ ]:
```