



# **Introduction to Programming**

## What is Programming Language

- A Programming language is a set of rules that provides a way of telling a computer what operations to perform.
- A program is set of instructions that is executed by a computer to accomplish a particular task.
- It Provides a linguistic framework for describing computations.
- It is set of rules for communicating an algorithm
- It is a notational system for describing computation in a machine readable and human readable form.

## What is Programming Language

- Any Common human language has words, vocabulary, symbols and Grammatical rules.
- Programming languages also have words, vocabulary, symbols and Grammatical rules.
- These grammatical rules are called as syntax.
- Each programming language has a different set of syntax rules.

# What is Programming Language

## Computer Programmer

Someone who can write computer programs or in other words, someone who can do computer programming is called a Computer Programmer.

## Algorithm

An **algorithm** is a step-by-step procedure to resolve any problem. An algorithm is an effective method expressed as a finite set of well-defined instructions.

## Example :

- Take list of 100 numbers (1 to 100).
- Create a list of squares of even numbers from above list



**What is Python ?**

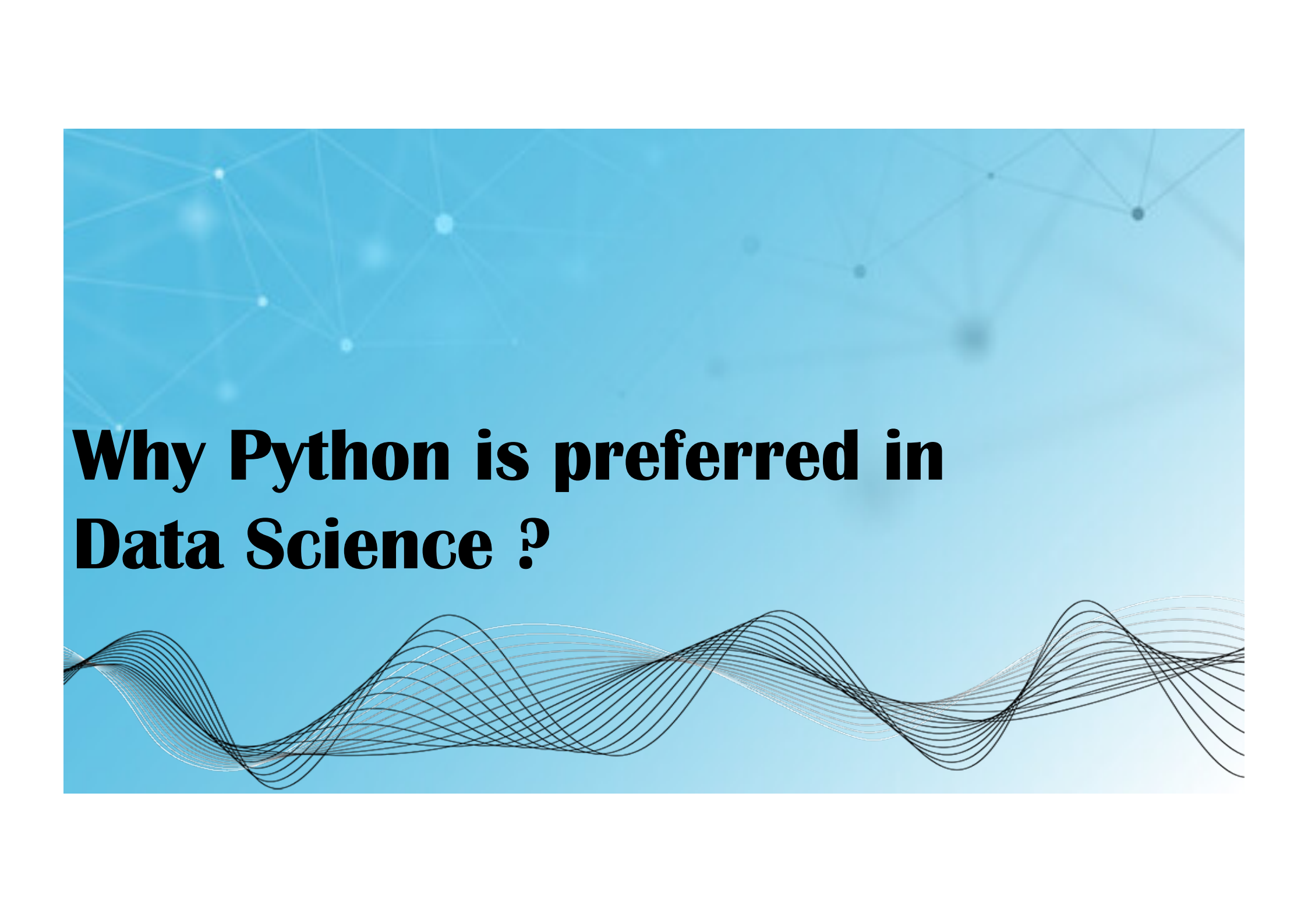
# Python



Python is a high-level, general-purpose and a very popular programming language. Python programming language (latest Python 3) is being used in web development, Machine Learning applications, along with all cutting edge technology in Software Industry.

## **Advantages of Python**

- Works on different platforms (Windows, Mac, Linux, etc).
- Simple syntax similar to the English language.
- Syntax that allows developers to write programs with fewer lines than some other programming languages.
- Runs on an interpreter system, meaning that code can be executed as soon as it is written. This means that prototyping can be very quick.
- Supports functional and structured programming methods as well as OOP.
- Provides very high-level dynamic data types and supports dynamic type checking.
- Can be easily integrated with Other Languages.



# **Why Python is preferred in Data Science ?**

# Python in Data Science

As a new Data Scientist, you know that your path begins with programming languages you need to learn. Python is the most popular language for all Data Scientists.

## But Why is this?

### Reasons behind Python's popularity in Data Science

- Python is a free and open-source language
- Simple Syntax as compared to other languages
- Availability of large number of libraries and frameworks (NumPy, Pandas ,matplotlib ...)
- Scalability
- Efficient Deep Learning
- Huge Community
- Jobs and Growth in market



# Installation

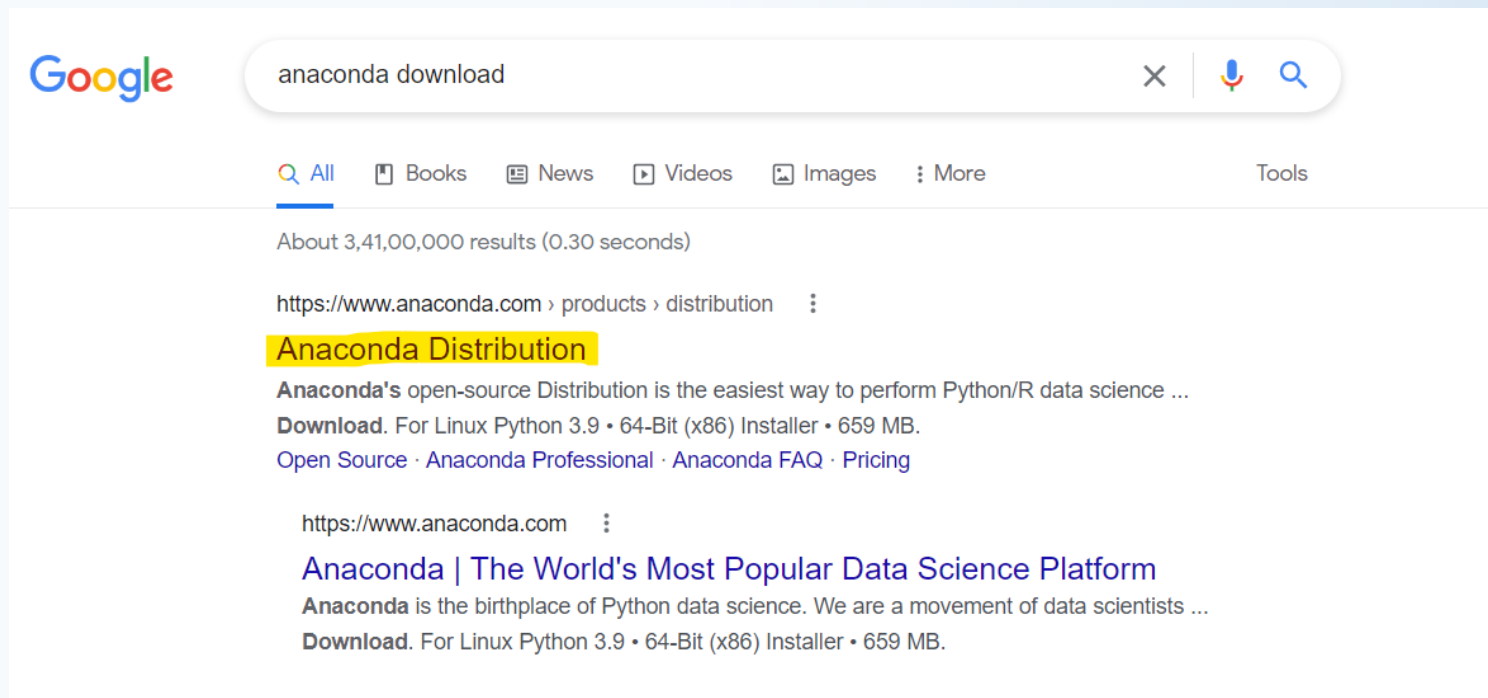


# Steps of installation

## Step 1)

Go to

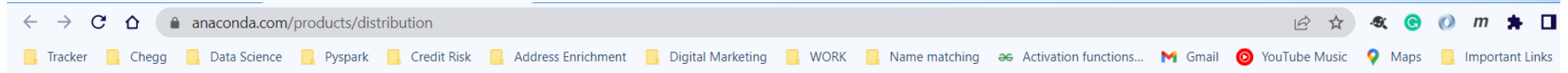
<https://www.anaconda.com/products/distribution>



## Steps of installation

### Step 2)

Select Your Operating System (Default download link is for windows operating system.)



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## ANACONDA DISTRIBUTION

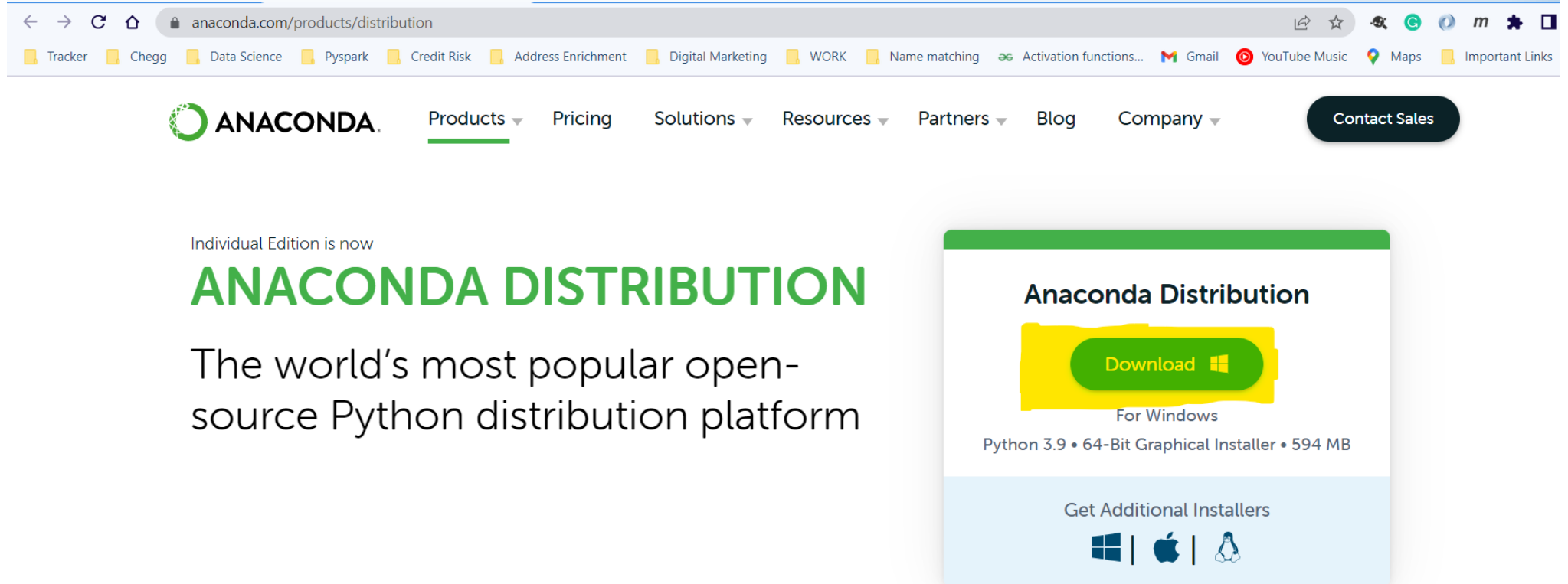
The world's most popular open-source Python distribution platform



## Steps of installation

### Step 3)

Once you have selected your operating system click on download button.



The screenshot shows the Anaconda Distribution website. The browser address bar displays 'anaconda.com/products/distribution'. The navigation bar includes the Anaconda logo, a 'Products' dropdown menu, and links for Pricing, Solutions, Resources, Partners, Blog, and Company. A 'Contact Sales' button is located on the right. The main content area features the text 'Individual Edition is now' followed by 'ANACONDA DISTRIBUTION' in large green letters. Below this, it states 'The world's most popular open-source Python distribution platform'. On the right, a card titled 'Anaconda Distribution' displays a yellow 'Download' button with a Windows logo. Below the button, it specifies 'For Windows' and 'Python 3.9 • 64-Bit Graphical Installer • 594 MB'. At the bottom of the card, a section titled 'Get Additional Installers' shows icons for Windows, macOS, and Linux.

anaconda.com/products/distribution

Tracker Chegg Data Science Pyspark Credit Risk Address Enrichment Digital Marketing WORK Name matching Activation functions... Gmail YouTube Music Maps Important Links


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# ANACONDA DISTRIBUTION

The world's most popular open-source Python distribution platform




### Anaconda Distribution

[Download](#) 

For Windows

Python 3.9 • 64-Bit Graphical Installer • 594 MB

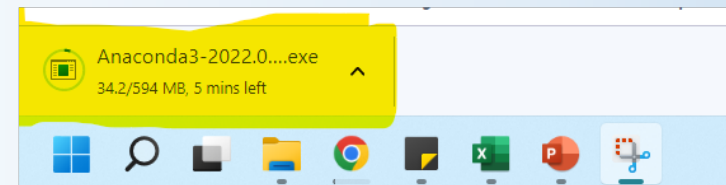
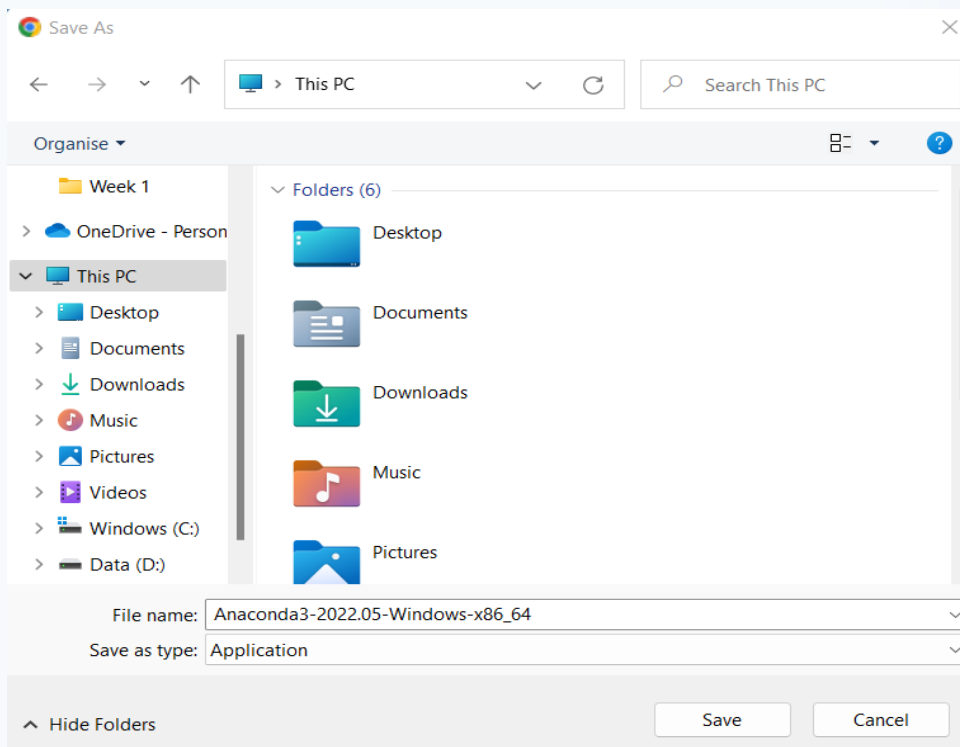
Get Additional Installers

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# Steps of installation

## Step 4)

Select the directory where you want to download your software and your download will start.

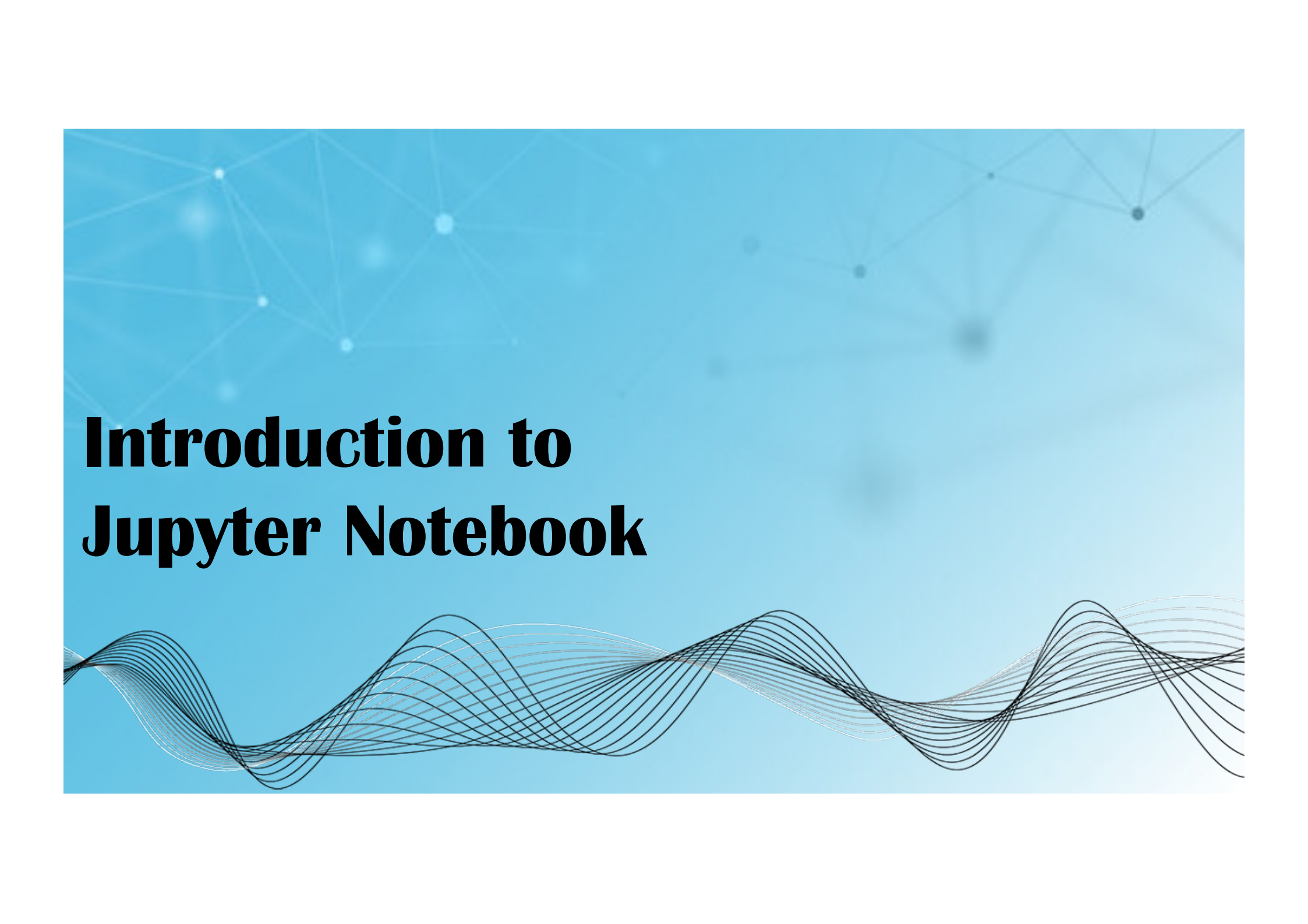


## Steps of installation

### Step 5)

Open your setup file which you have downloaded and select your default settings at each step and at last click on finish.





# **Introduction to Jupyter Notebook**

# Jupyter Notebooks



A Jupyter Notebook is an open source web application that allows data scientists to create and share documents that include live code, equations, and other multimedia resources.

## Use of Jupyter Notebook:

Jupyter notebooks are used for all sorts of data science tasks such as exploratory data analysis (EDA), data cleaning and transformation, data visualization, statistical modeling, machine learning, and deep learning.

## Advantage of Using Jupyter Notebook :

- Useful for "showing the work" through a combination of code, markdown, links, and images.
- Jupyter notebooks can also be converted to a number of standard output formats (HTML, PowerPoint, LaTeX, PDF, Restructured Text, Markdown, Python)



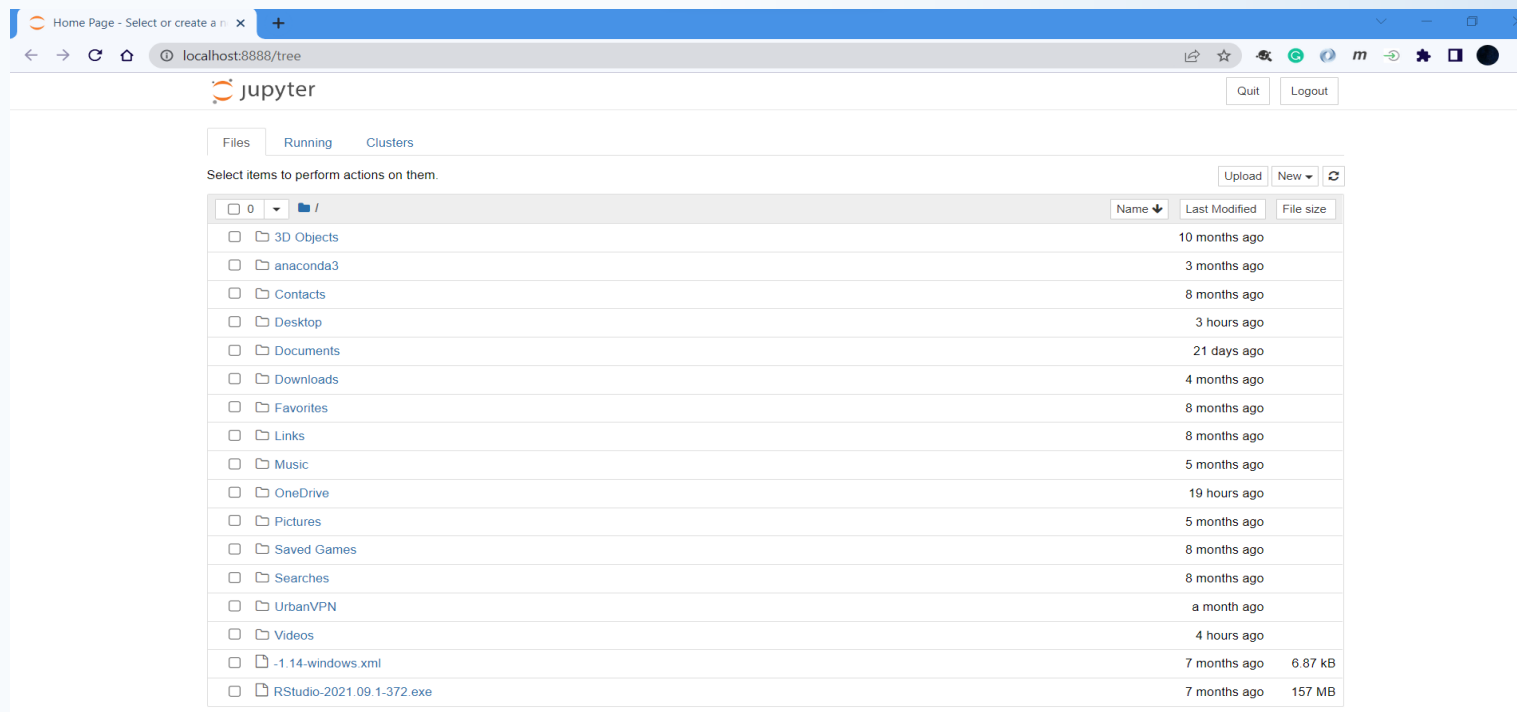


# **Working of Jupyter Notebook**

# Working of Jupyter Notebooks

Step 1) Open Jupyter Notebook from apps

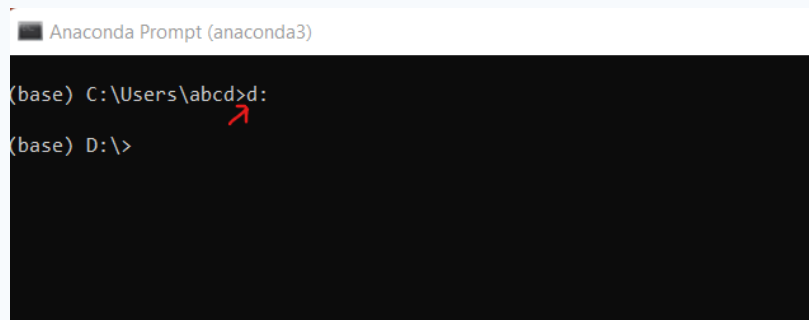
Step 2) In your default browser a web page will open like this and default directory will be C drive of your system.



# Working of Jupyter Notebooks

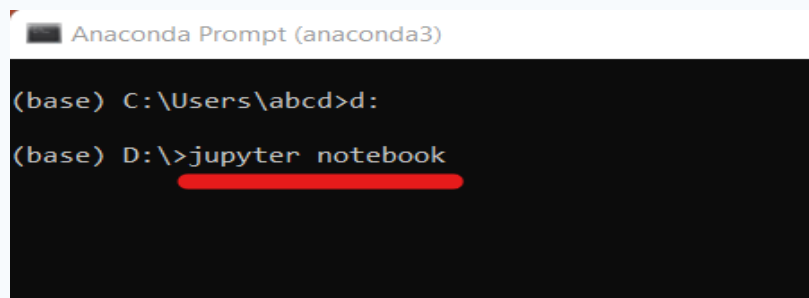
Step 3) If you want to run and save your code in other directory then follow these steps:

- 1) Open Anaconda Prompt (anaconda3) from start menu.
- 2) Type the directory name followed by colon (:) and then press Enter (Example – d:)
- 3) Type **jupyter notebook** and then Enter.



```
Anaconda Prompt (anaconda3)
(base) C:\Users\abcd>d:
(base) D:\>
```

A screenshot of the Anaconda Prompt window. The title bar reads 'Anaconda Prompt (anaconda3)'. The command prompt shows the user at the C: drive, typing 'd:' to switch to the D: drive. A red arrow points to the 'd:' input. The prompt then shows '(base) D:\>'.

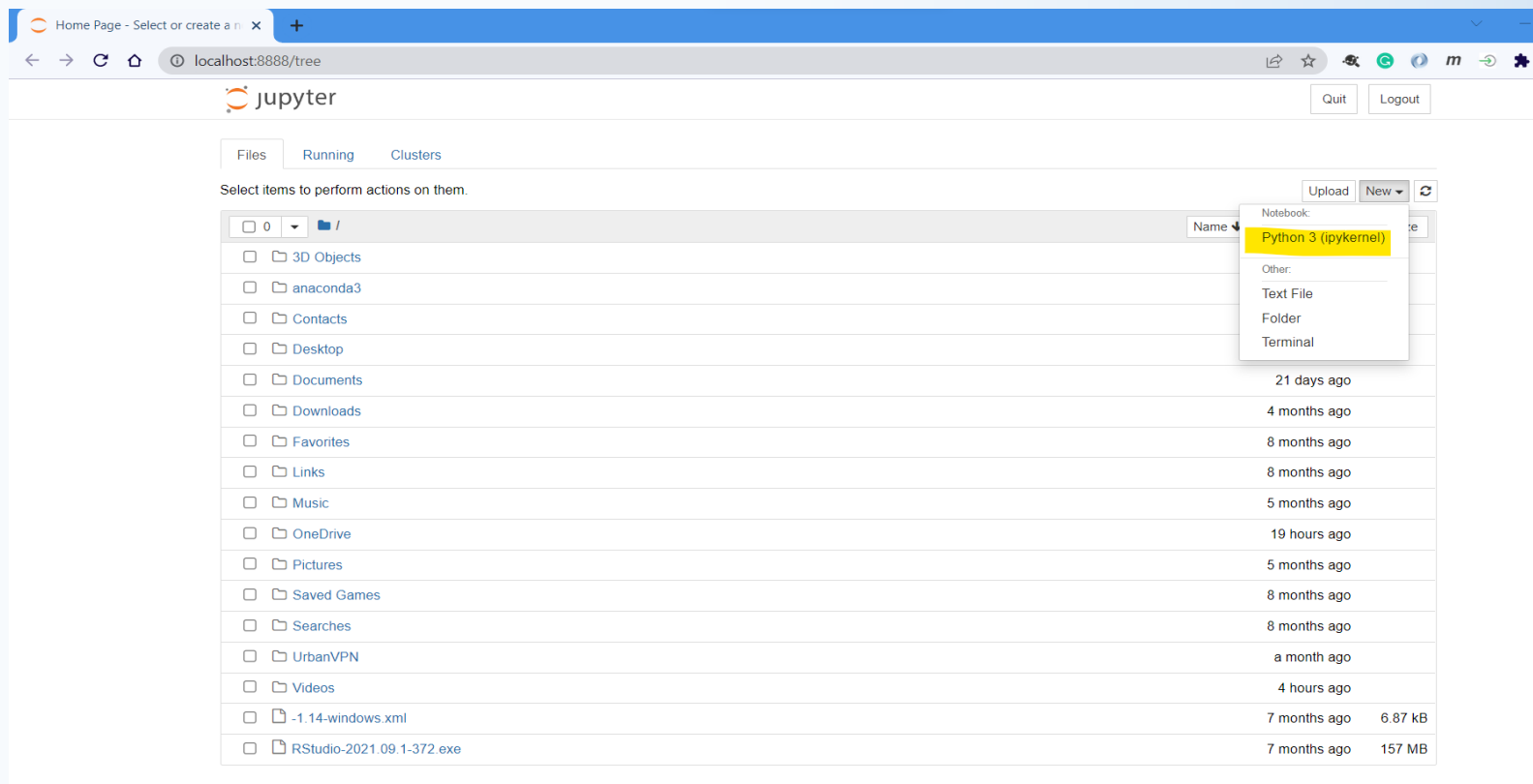


```
Anaconda Prompt (anaconda3)
(base) C:\Users\abcd>d:
(base) D:\>jupyter notebook
```

A screenshot of the Anaconda Prompt window. The title bar reads 'Anaconda Prompt (anaconda3)'. The command prompt shows the user at the D: drive, typing 'jupyter notebook'. The command is highlighted with a red underline.

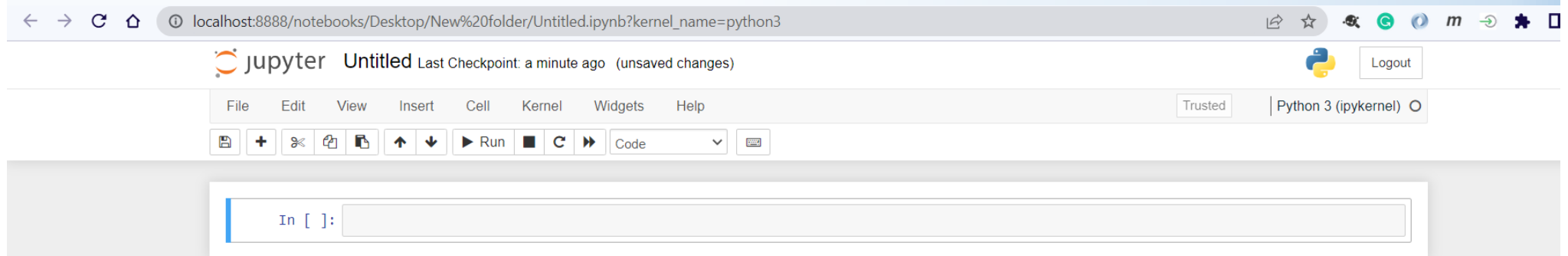
# Working of Jupyter Notebooks

Step 4) Open your preferred folder and then click on New -> Python 3.



# Working of Jupyter Notebooks

Step 5) A new notebook will be opened with name 'Untitled.ipynb' and you can run your code here.



## Commands and Shortcut of Jupyter Notebooks

Action	Menu	Keyboard Shortcuts
Run selected cells	Cell -> Run Cells	Ctrl + Enter
Run the current cell and go down	Cell -> Run Cells and Select Below	Shift + Enter
Save and checkpoint	File -> Save and Checkpoint	Ctrl + S
Insert cell above	Insert -> Insert Cell Above	A
Insert cell below	Insert -> Insert Cell Below	B
Change the cell type to Code	Cell -> Cell Type -> Code	Y
Change the cell type to Markdown	Cell -> Cell Type -> Markdown	M
Code completion or indent		Tab



**Google Colab**

# Google Colab



- Colab is a free Jupyter notebook environment that runs entirely in the cloud.
- It does not require a setup.
- Notebooks that you create can be simultaneously edited.
- Supports many popular machine learning libraries which can be easily loaded in your notebook.

## You can perform the following using Google Colab:

- Write and execute code in Python
- Create/Upload/Share notebooks
- Import/Save notebooks from/to Google Drive
- Import/Publish notebooks from GitHub
- Import external datasets e.g. from Kaggle
- Integrate PyTorch, TensorFlow, Keras, OpenCV
- Free Cloud service with free GPU/TPU.



# Google Colab

## Steps to use Google Colab

### Step 1 )

Log in to your Google account in your browser.

### Step 2 )

Open the following link : <https://colab.research.google.com>

Once you open this link a demo notebook will be opened.

### Step 3)

Go to **File -> New Notebook**

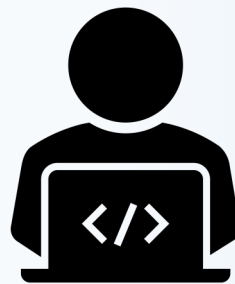
A new notebook will open similar to Jupyter Notebook.

### Step 4)

Write your code and Save it.

It will be saved in your Google Drive.

**Note :** If you want to find the location of your file then Go to **File -> Locate in Drive**



Keep Learning..... Keep Coding..... Keep going.....