INTRODUCTION TO PYTHON PROGRAMMING LANGUAGE

WORKSHOP DETAILS

- Instructor: Tanya Khanna
- Email: tk759@scarletmail.rutgers.edu
- Workshop Materials:
  - Github Link: https://github.com/Tanya-Khanna/DataScienceWorkshop_Fall-2024_NBL
  - Spring 2024 Workshops:
    - Link

SCHEDULE

Introduction to Python Programming	September 9, 2024; 4 - 5:30 PM
Advanced Python Programming	September 16, 2024; 4 - 5:30 PM
Web Scraping with Python	September 23, 2024; 4 - 5:30 PM
Mastering Data Analysis: Pandas and Numpy	September 30, 2024; 4 - 5:30 PM
Data Management with Python: SQL and NoSQL	October 7, 2024; 4 - 5:30 PM
Python for Visualization and Exploration	October 14, 2024; 4 - 5:30 PM
Introduction to Machine Learning: Supervised Learning	October 21, 2024; 4 - 5:30 PM
Introduction to Machine Learning: Unsupervised Learning	October 28, 2024; 4 - 5:30 PM
Deploying Machine Learning Models	November 4, 2024; 4 - 5:30 PM
Ethical AI and Responsible Data Science	November 11, 2024; 4 - 5:30 PM

https://libcal.rutgers.edu/calendar/nblworkshops?cid=4537&t=d&d=0000-00-00&cal=4537&inc=0

TABLE OF CONTENTS

What is Python?

A programming language that is:

- general purpose [multi-use like a swiss army knife]
- high level [user-friendly]
- structured
- Interpreted [real time translation!]
- object-oriented [building-block style like LEGO]

What can Python do?

A way to enter instructions for the computer to perform.

- Crunch numbers
- Manipulate files
- Analyze data
- Create graphs

"If this condition is true, perform this action; otherwise, do that action."

"Do this action exactly 27 times."

"Keep doing that until this condition is true."

Who uses Python?

- Researchers
- Data Scientists
- Web Developers
- Software Developers
- Mathematicians
- Or **anyone** wanting to automate stuff that they do.

Why learn Python?

- (Relatively) easy to learn / clean syntax
- Versatile: can do lots of stuff!
- It’s extendable
- It’s free

Downsides of Python?

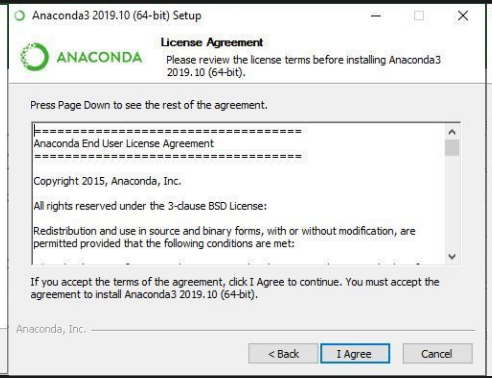
- Can run slower than other languages like C++
- Might require more machine time
- Not the go-to choice for mobile app development

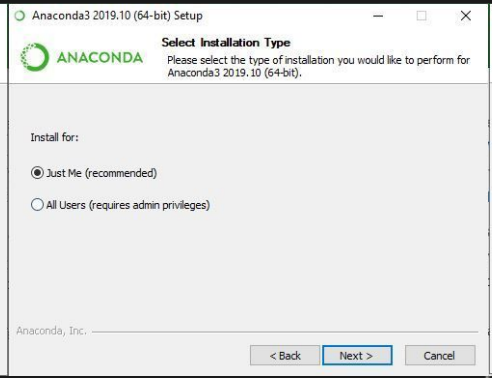
Ways to Run Python: Jupyter Notebooks

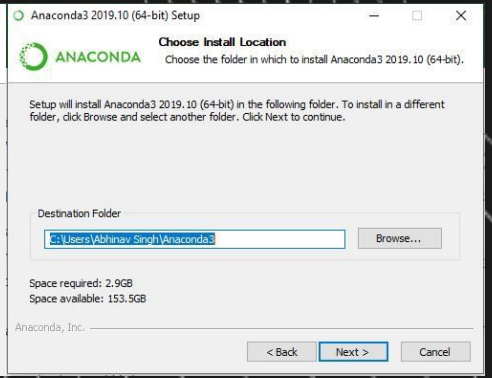
- Open-source web application for live code, equations, visualizations, and narrative text.
- Supports over 40 programming languages, including Python, R, Julia, and Scala.
- Widely used in industry and academia.
- Real-time code execution.

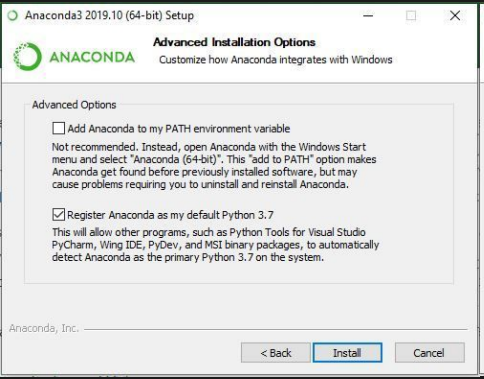
Installation: Windows

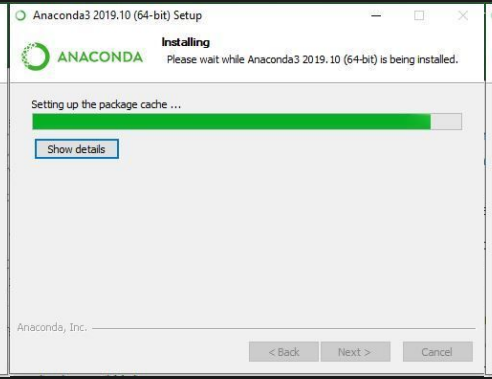
Download and install Anaconda; latest version of Anaconda Graphical Installer for Windows.

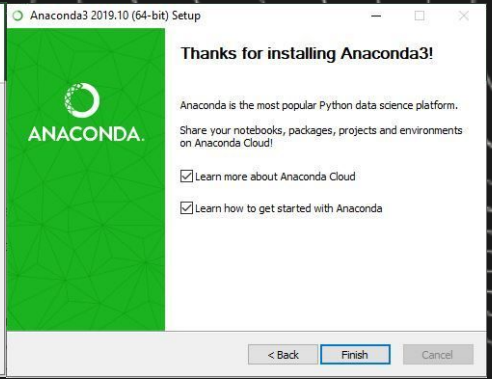






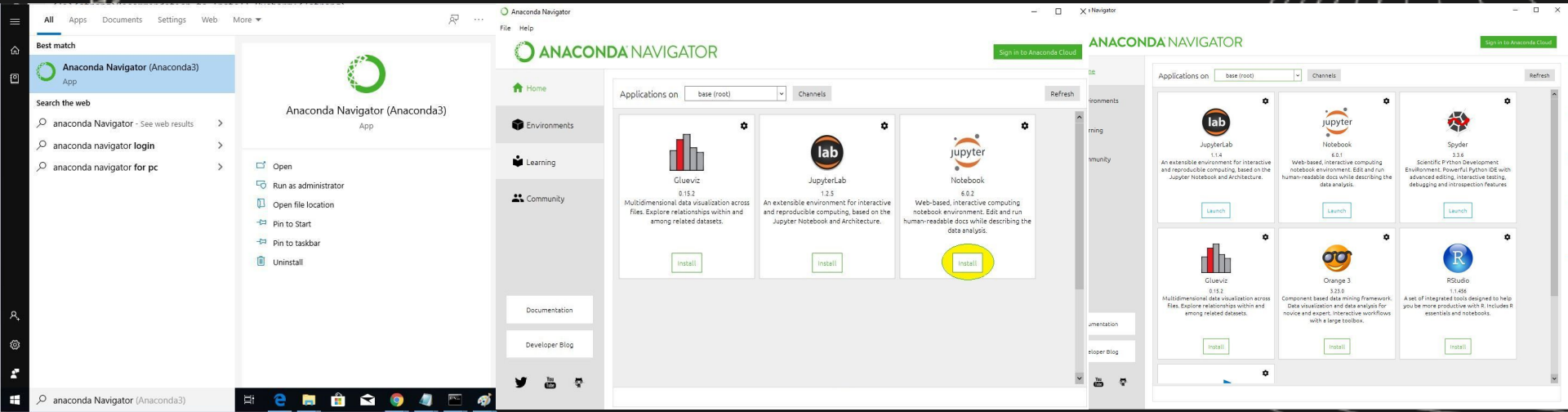






Installation: Windows

Once the installation process is done, Anaconda can be used to perform multiple operations. To begin using Anaconda, search for Anaconda Navigator from the Start Menu in Windows.



Installation: Mac

Download and install Anaconda; latest version of Anaconda Graphical Installer for MacOS.

- The process of installing Jupyter Notebook using Anaconda on Mac is very similar to the Windows installation.
- Open the Anaconda Navigator from your Applications folder. Click on the Jupyter Notebook icon to launch the application.
- Jupyter Notebook Install Using `pip` on Mac:
    - Download and install the latest version of Python from the official website (https://www.python.org/downloads/).
    - Open the Terminal and run the following command to install Jupyter Notebook:

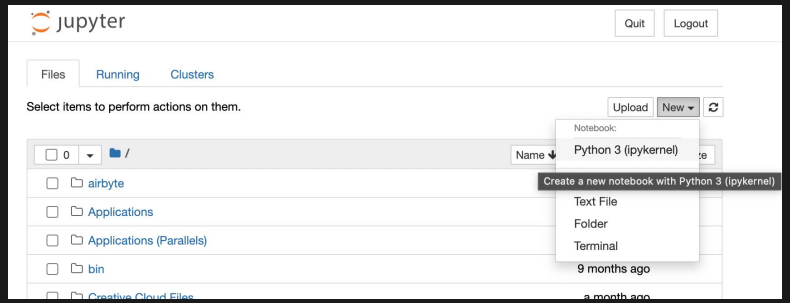
      pip3 install jupyter

    - Type the following command in the Terminal to launch Jupyter Notebook:

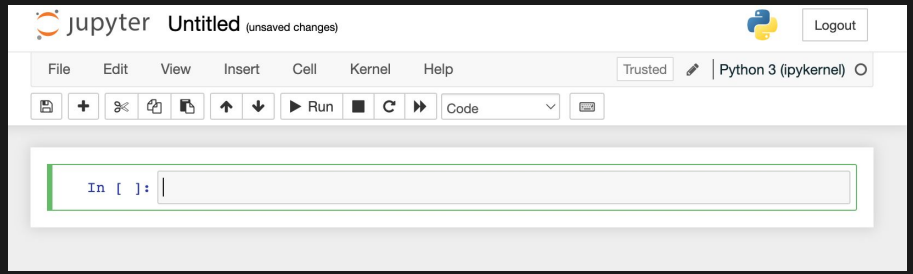
      jupyter notebook

Getting Started With Jupyter Notebook

1. To create a new notebook, click on the “New” button in the top right corner of the Jupyter Notebook interface and select “Python 3” (or the version you have installed) from the drop-down menu.



2. A new notebook will open with an empty code cell. You can start writing your code, markdown text, or equations in the cell. To execute the code in a cell, press Shift + Enter.



3. You can add new cells, delete cells, or change the cell type (code, markdown, or raw) using the toolbar at the top of the notebook. Additionally, you can access various notebook settings, download the notebook in different formats, or save and checkpoint your progress using the “File” and “Kernel” menus.