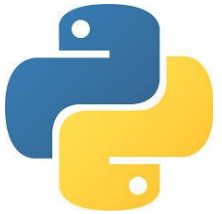
APSSDC

Andhra Pradesh State Skill Development Corporation

Programming Using Python



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For Attendance and Verification Purpose

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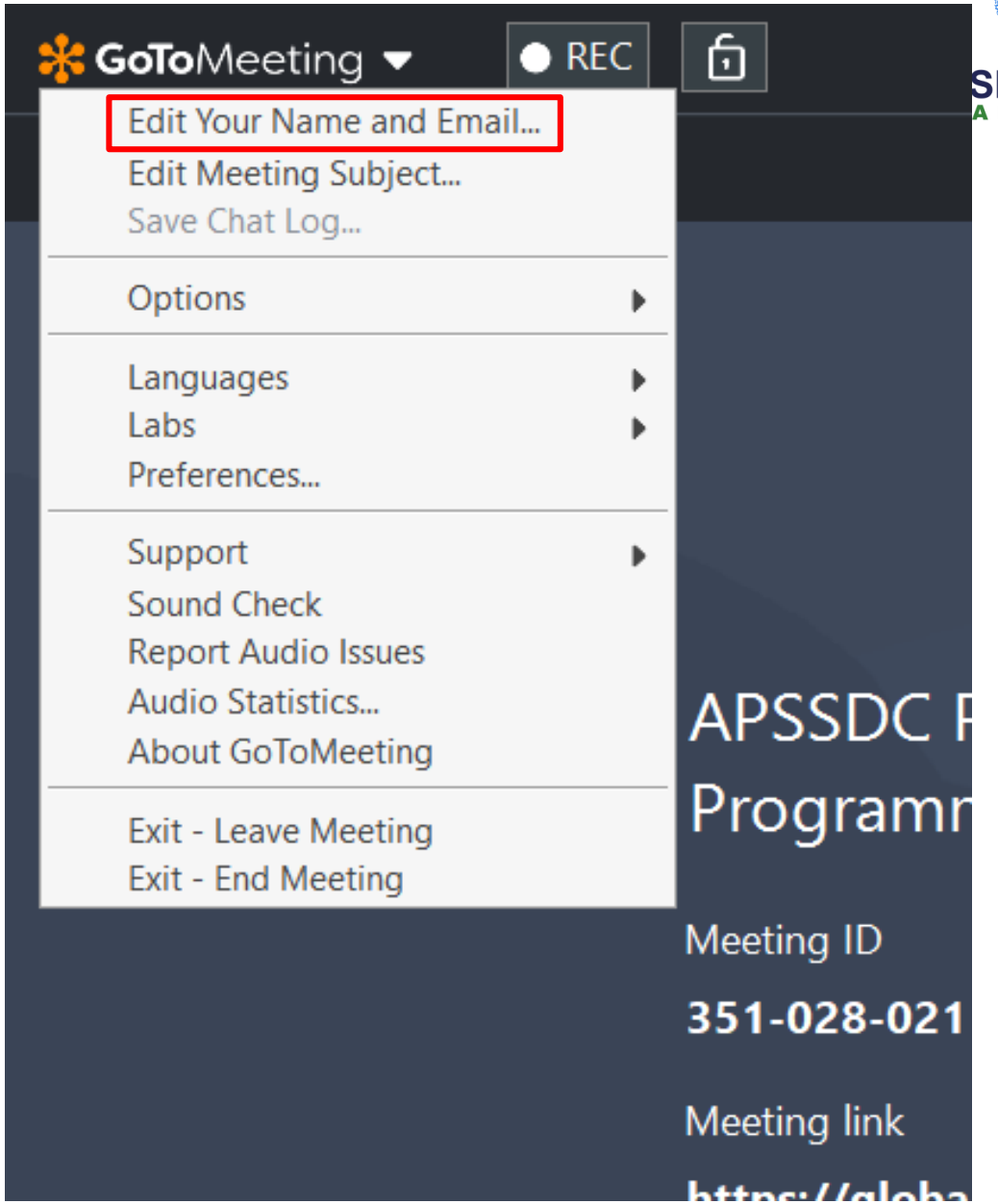

Session Resources

http://bit.ly/apssdc-python-mb10

Why you are attending this training

Why python?

Why python

PYPL Index | 10 TOP IDE | 10 TOP ODE | 10 TOP DB

PYPL PopularitY of Programming Language

Worldwide, Dec 2020 compared to a year ago:

Rank	Change	Language	Share	Trend
1		Python	30.34 %	+1.2 %
2		Java	17.23 %	-1.7 %
3		JavaScript	8.65 %	+0.6 %
4		C#	6.44 %	-0.8 %
5	↑	C/C++	6.11 %	+0.1 %
6	↓	PHP	5.88 %	-0.3 %
7		R	3.84 %	+0.1 %
8		Objective-C	3.75 %	+1.2 %
9		Swift	2.17 %	-0.3 %
10	↑	Matlab	1.77 %	-0.0 %
11	↓	TypeScript	1.62 %	-0.2 %
12	↑↑↑	Go	1.52 %	+0.3 %
13	↓	Kotlin	1.44 %	-0.2 %

The PYPL PopularitY of Programming Language Index is created by analyzing how often language tutorials are searched on Google.

The more a language tutorial is searched, the more popular the language is assumed to be. It is a leading indicator. The raw data comes from Google Trends.

If you believe in collective wisdom, the PYPL Popularity of Programming Language index can help you decide which language to study, or which one to use in a new software project.

Python as a Language

Python is the language of the Python Interpreter and those who can converse with it. An individual who can speak Python is known as a Pythonista. It is a very uncommon skill, and may be hereditary. Nearly all known Pythonistas use software initially developed by Guido van Rossum.

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History

Python is an interpreted, high-level, general-purpose programming language.

- 1994 -----> v1.0
- 2000 -----> v2.0 – 2020 2.7
- 2008 -----> v3.0
- 2019 -----> v3.8 3.7+
- 2020 -→ 3.9.0

Guido Van Rossum

Language properties

1. Everything is an object
2. Modules, classes, functions
3. Exception handling
4. Dynamic typing, polymorphism
5. Static scoping
6. Operator overloading
7. Indentation for block structure

High-level data types

1. Numbers: int, float, complex
2. Strings: immutable
3. Lists, Tuple, Sets, dictionaries: containers
4. Other types for e.g. binary data, regular expressions, introspection
5. Extension modules can define new “built-in” data types

Comparsions

Java

1. Typically 3-5 times shorter than equivalent Java programs
2. Run-time works harder than Java's
3. Components can be developed in Java and combined to form applications in Python
4. Python can be used to prototype components into Java implementation

Comparsions, cont'd

Perl

1. Come from similar backgrounds
2. Python is more applicable than Perl
3. Perl emphasizes support for common application-oriented tasks
4. Python emphasizes support for common programming methodologies

Comparsions, cont'd

C++

1. Differences are similar to Java's
2. Often 5-10 times shorter than equivalent C++ code
3. Python shines as a glue language; used to combine components written in C++

Features of Python

- Easy To Learn, Code And Read
- Free And Open-source
- High-level Programming Language
- Portable And Extensible
- Interpreted
- Object-oriented
- Embeddable
- Large Range Of Library
- GUI Programming
- Dynamically Typed

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High Level → Human Understandable → Complier, Interpreter
Assembly/Intermediate/Middle → half humans and half machine → Embedded C
Assign A, #10
move 10, #10 → Assemble Programming → machine Code → Assembler
Low Level → Machine Understandable 0101010100

Python Programming Applications

Python had been developed to assimilate and work dynamically across various platforms. Here is a list of applications on its functional role:

1. Artificial Intelligence
2. Machine Learning
3. Data Analysis
4. Web Development
5. Game Development
6. Embedded Applications
7. Scripting Applications

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Softwares

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- Basic python IDLE
    - from https://www.python.org/downloads/
  - VS Code
  - PyCharm
  - Sublime Text
  - Atom
  - Spyder
- Jupyter Notebook by Anaconda Distributions
    - From https://www.anaconda.com/products/individual
- Google Colab by Google cloud service
    - From https://colab.research.google.com/
    - DataLab
- Different online editors
    - From https://repl.it/languages/python3
    - Kaggle
    - Azure Jupyter notebooks

Google Colab Resources:

Here I run some test.

https://colab.research.google.com/notebook#fileId=1dint4ly-7h8Trw0XRJ1uhC_VKe_wDJfY

In short:

n1-highmem-2 instance

2vCPU @ 2.2GHz

13GB RAM

100GB Free Space

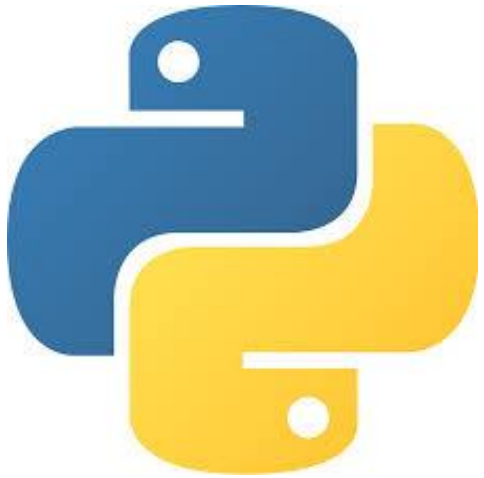
idle cut-off 90 minutes

maximum 12 hours

2020 Update:

GPU instance downgraded to 64GB disk space.

Anaconda for Python



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Anaconda

It Is a platform/navigator to run python

Why should we use Anaconda for Python?

Many **scientific packages require a specific version of Python** to run. It's difficult to keep various Python installations on one computer from interacting and breaking, and harder to keep them up-to-date.

Anaconda Distribution makes management of multiple Python versions on one computer easier, and provides a large collection of highly optimized, commonly used data science libraries to get you started faster Link for installation of Anaconda Software: https://www.anaconda.com/distribution/

Jupyter

- Jupyter is a web - application
- Jupyter name is a reference to the three core programming languages supported by Jupyter, which are Julia, Python and R

Jupyter Notebook: The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text.

Uses include: data cleaning and transformation, numerical simulation, statistical modelling, data visualization, machine learning, and much more.

Advantages: Best for data exploration, data preparation, data validation, ….

Anaconda Installation

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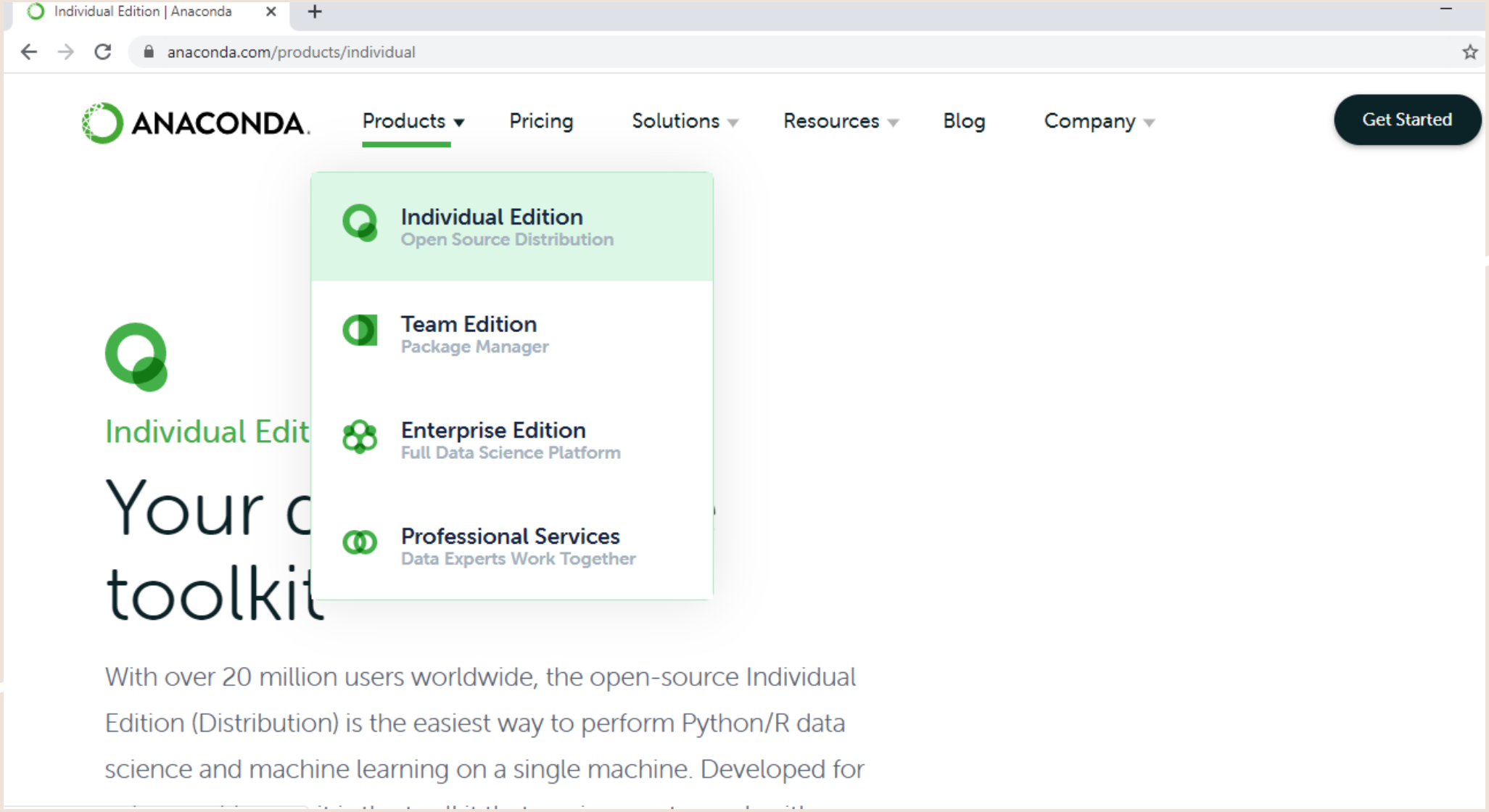
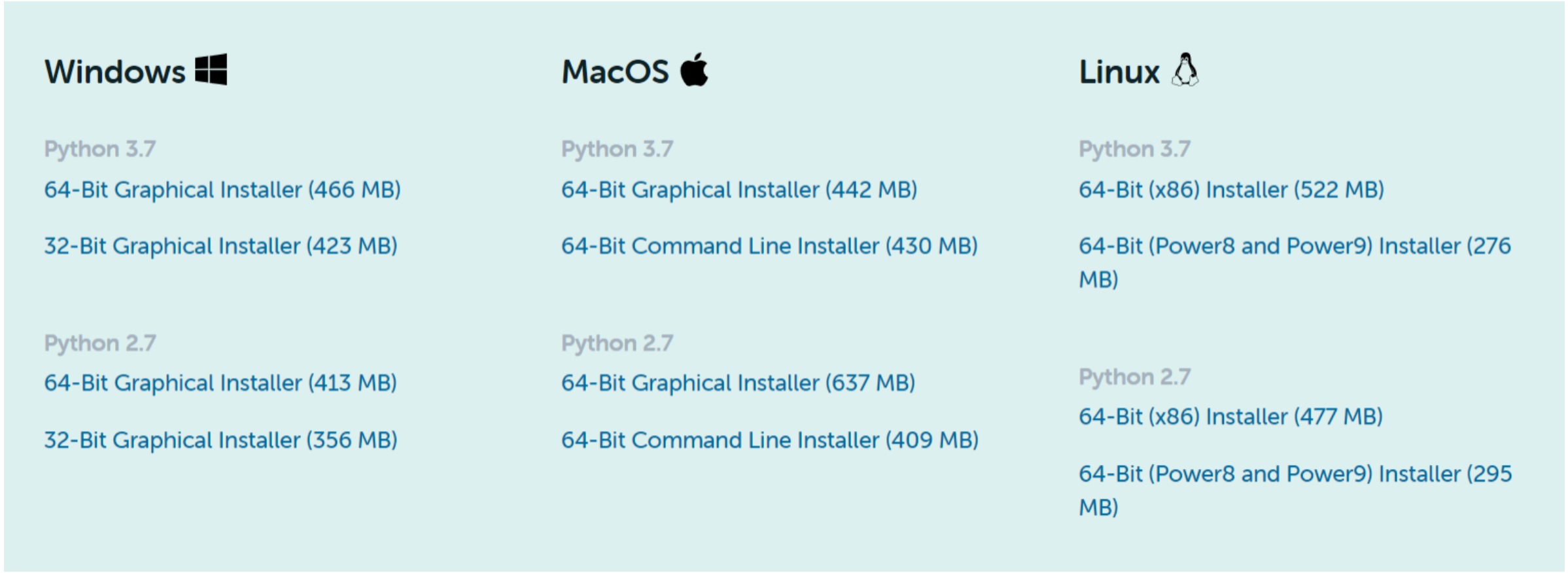
Installation

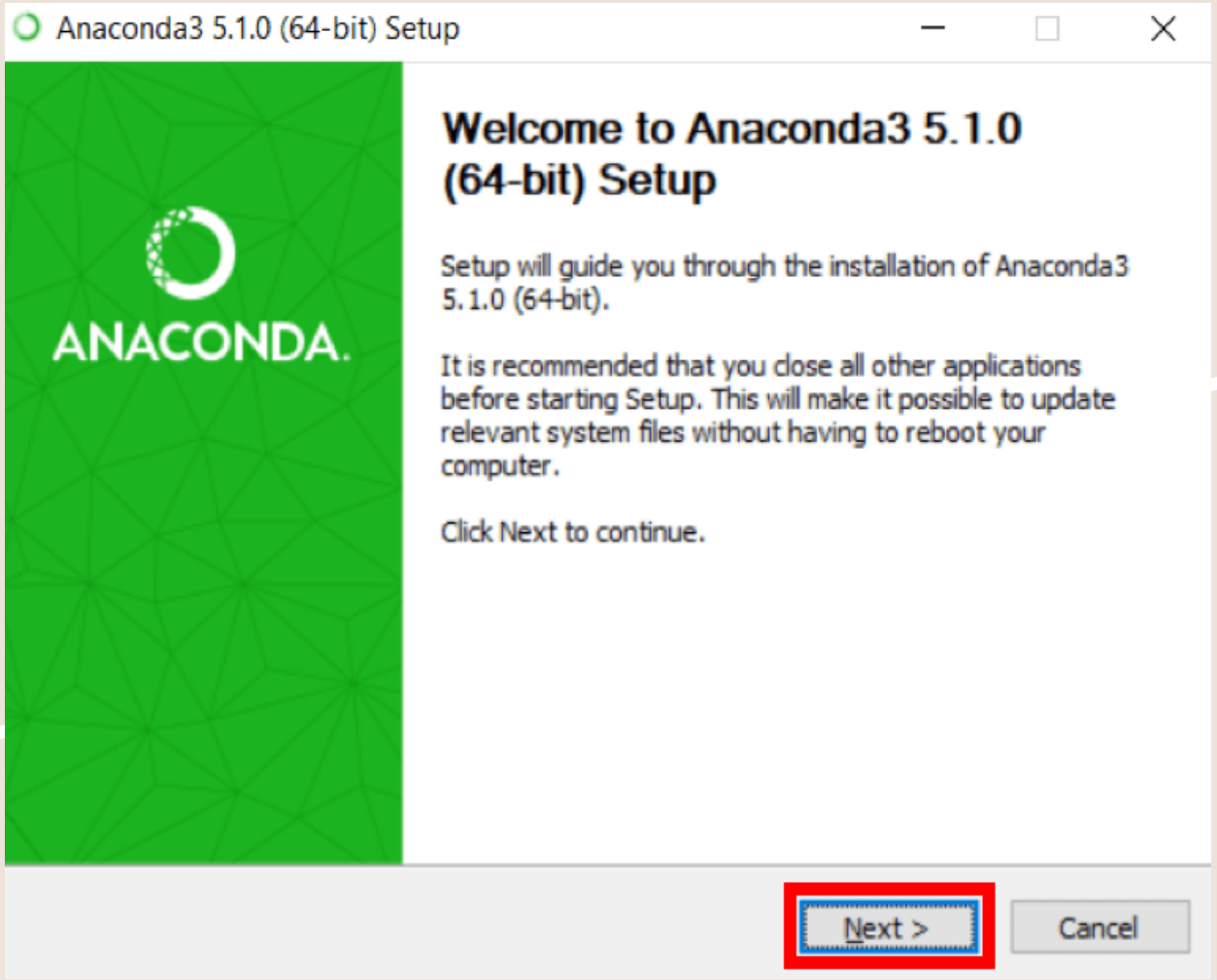


Downloading Anaconda Software

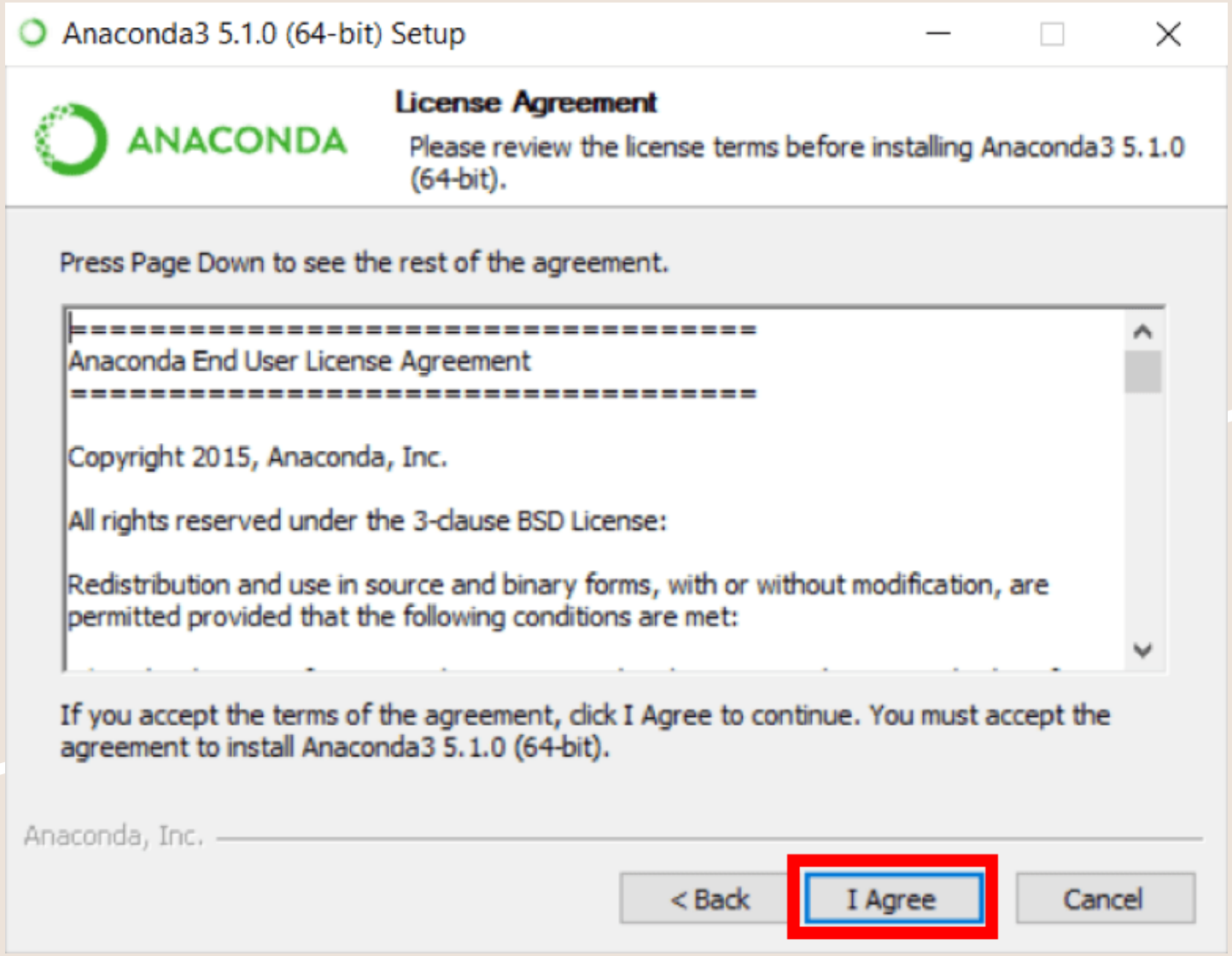


Visit: https://www.anaconda.com/products/individual

Installation



Installation



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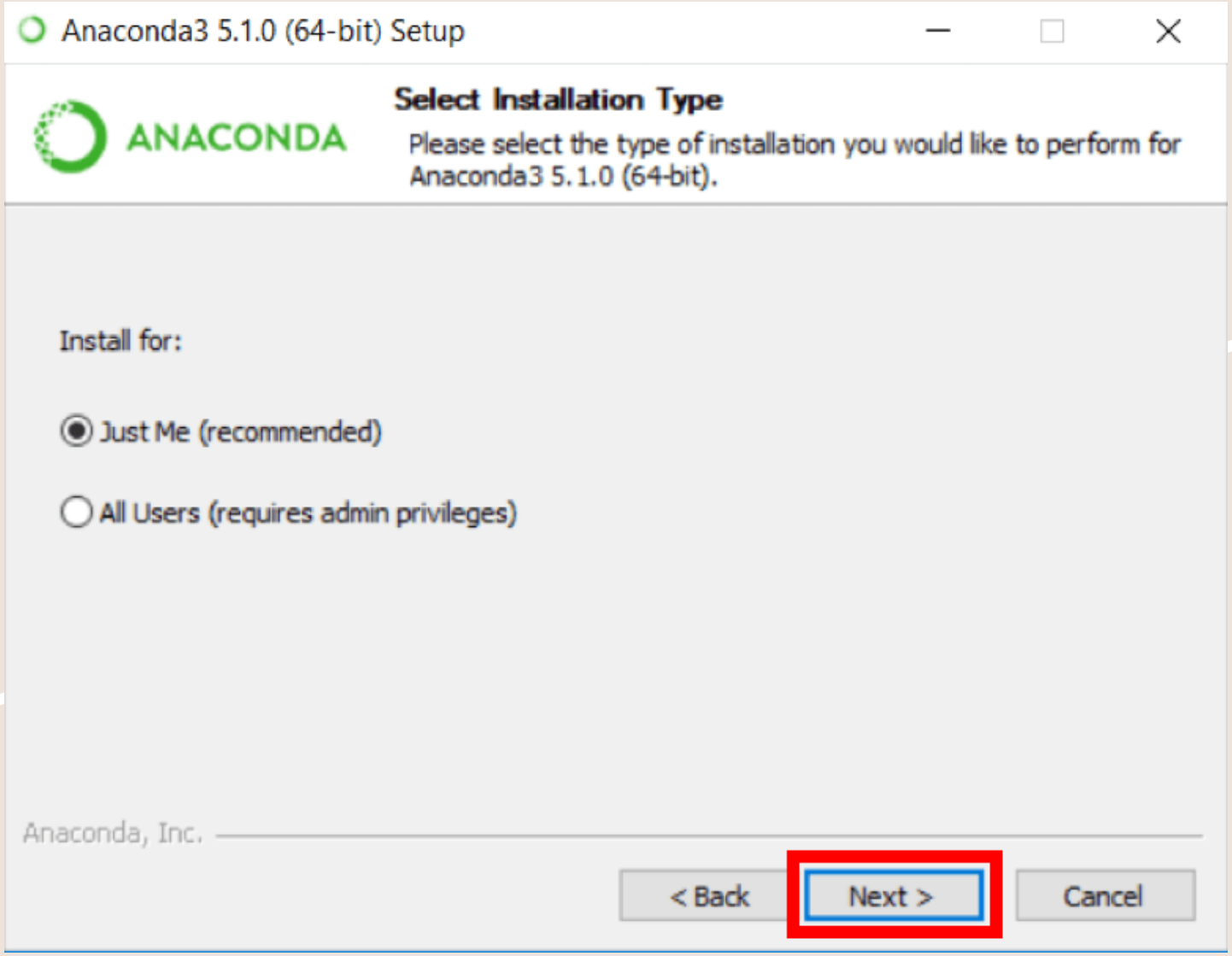

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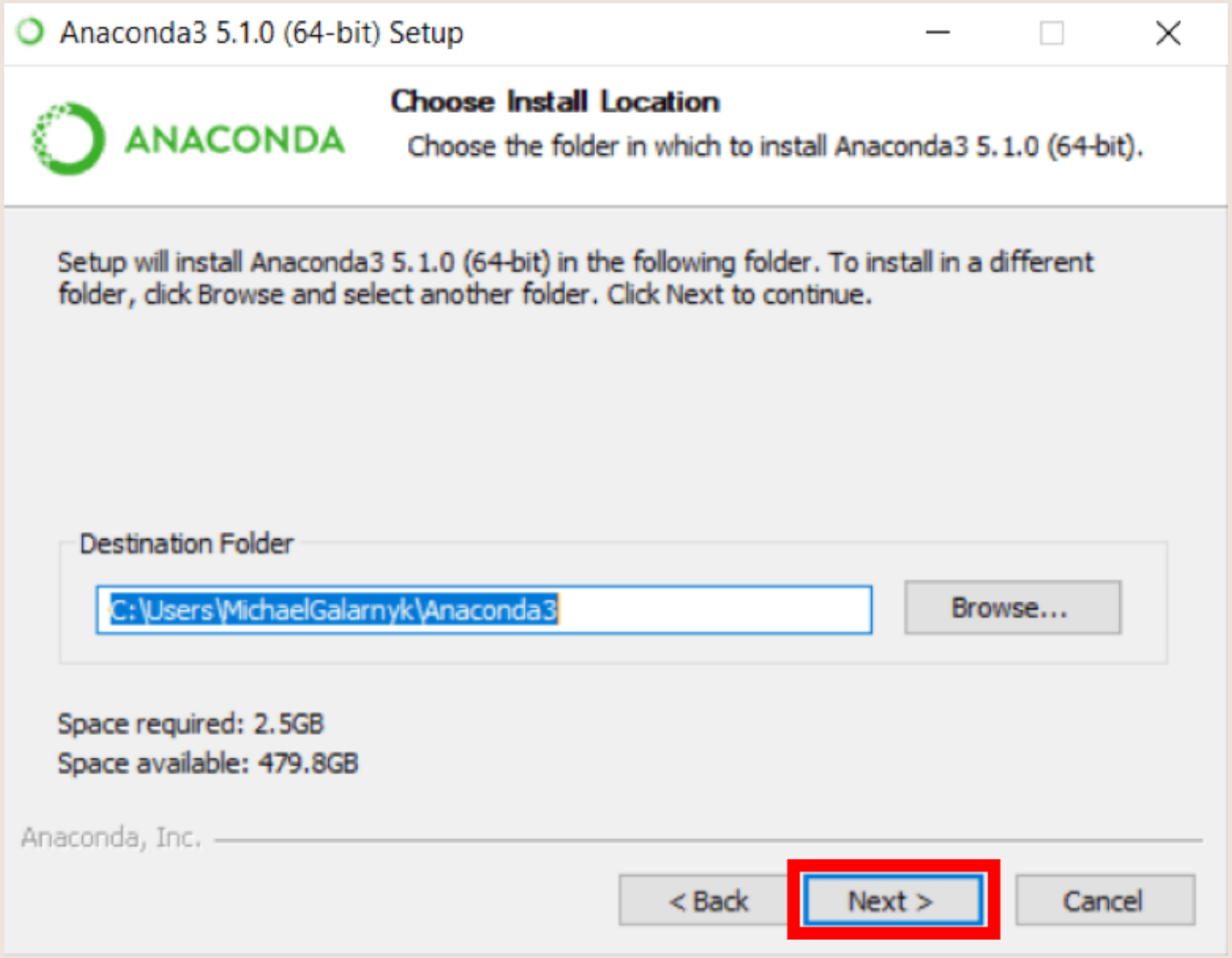

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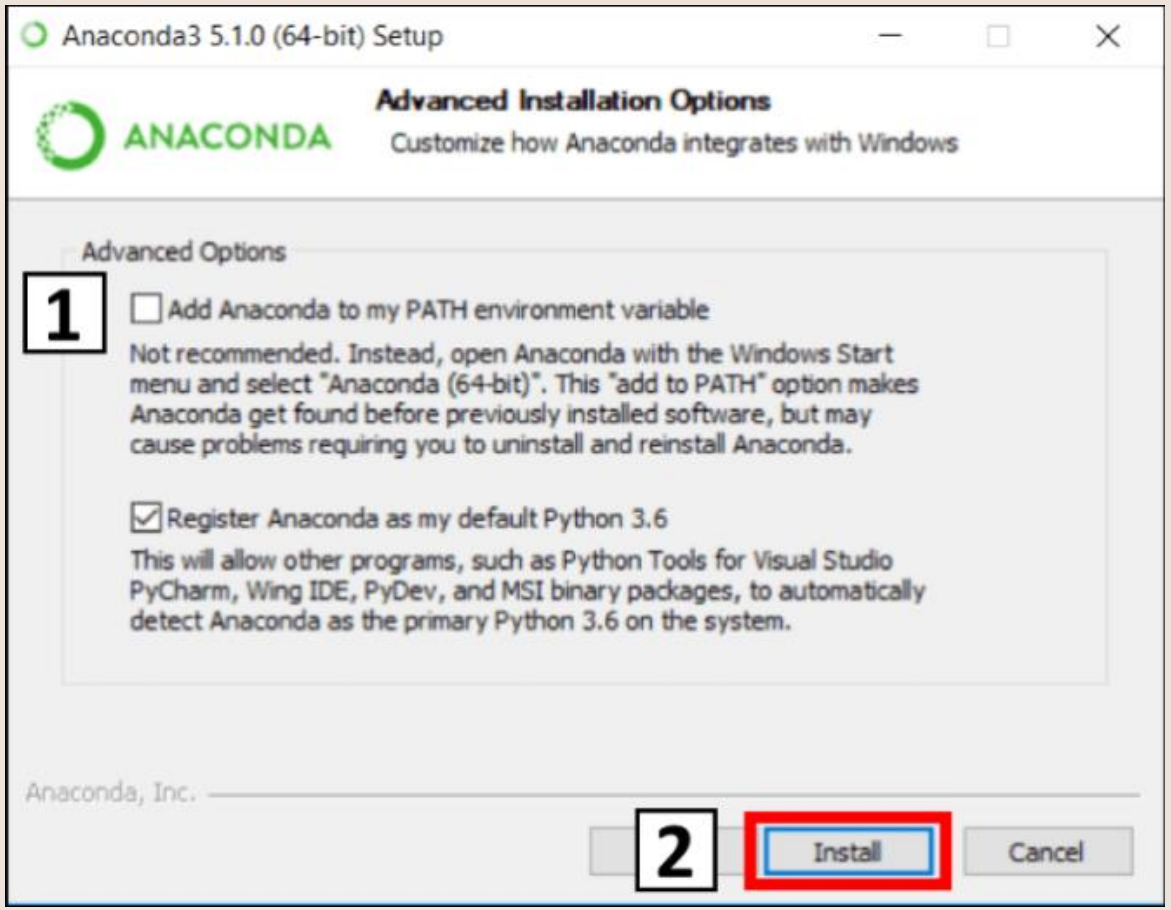

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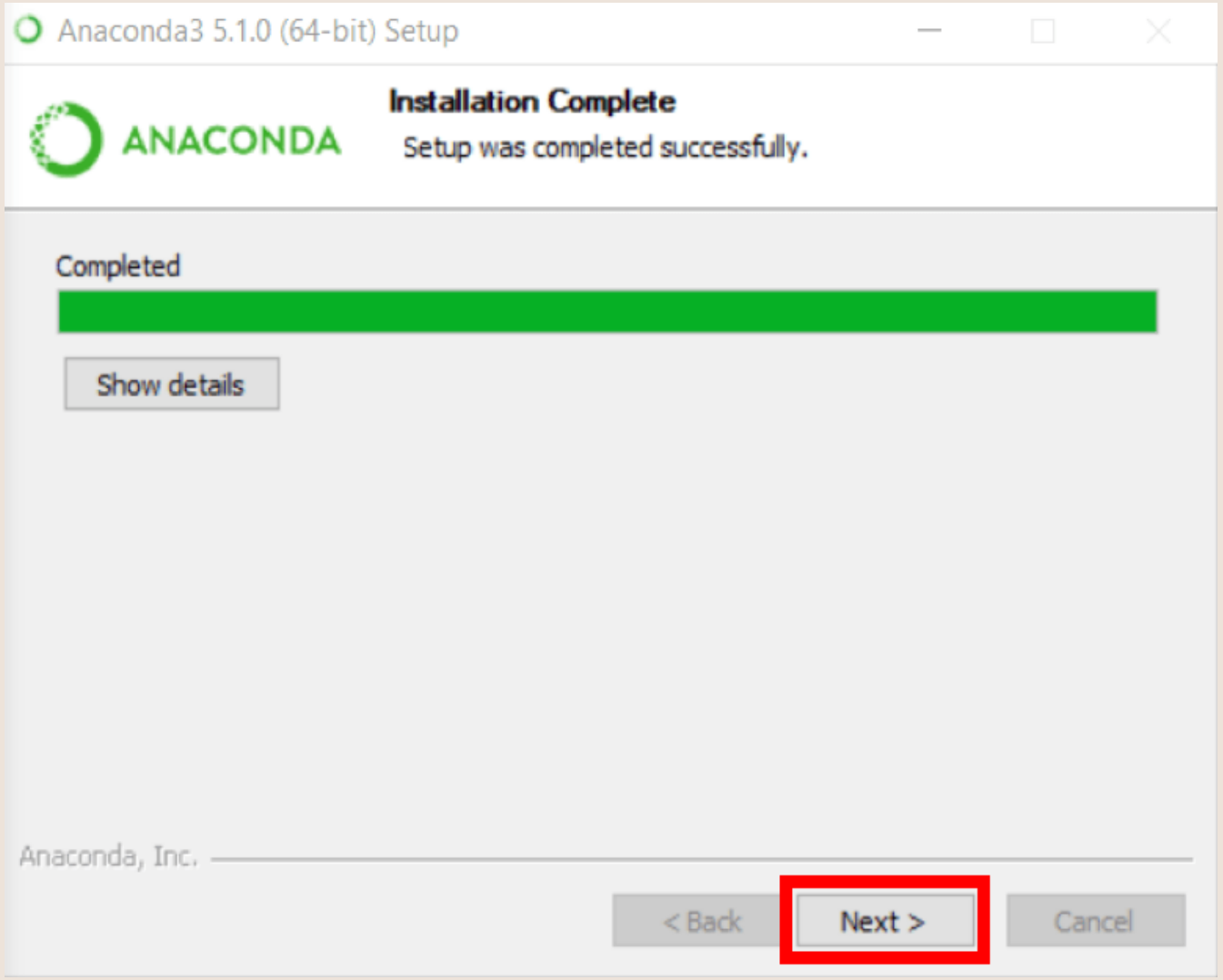

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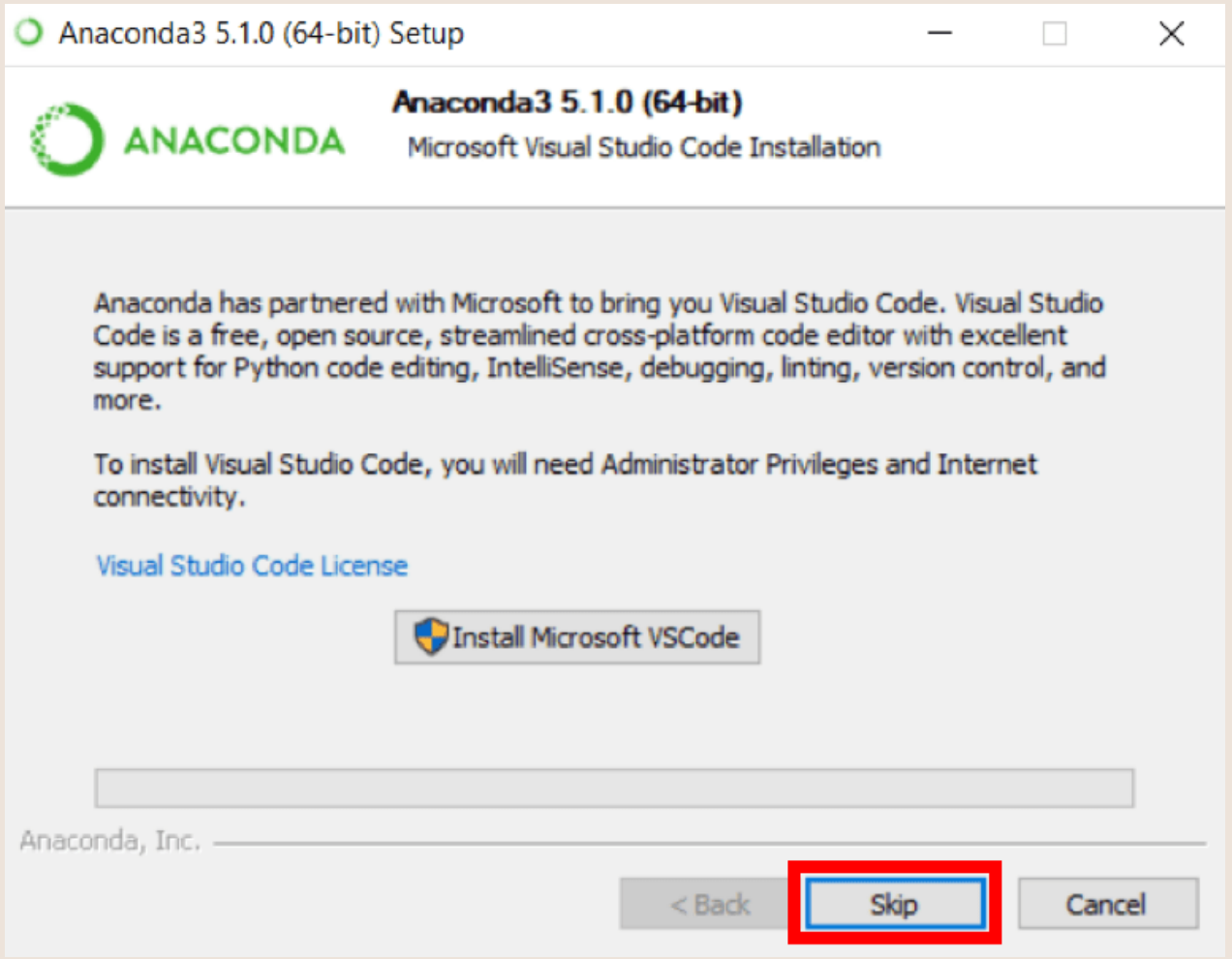
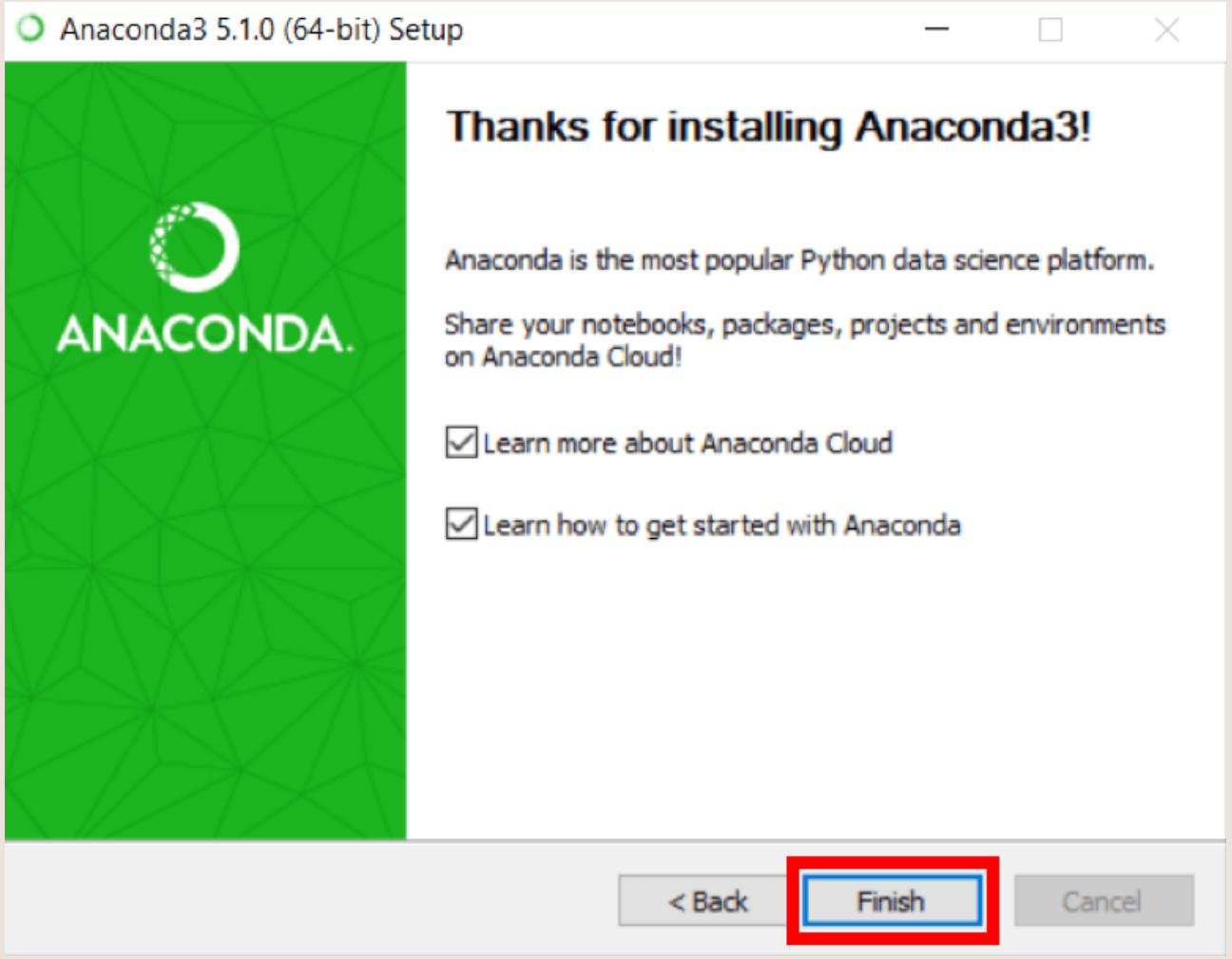


Installation



Let us start Jupyter Notebook

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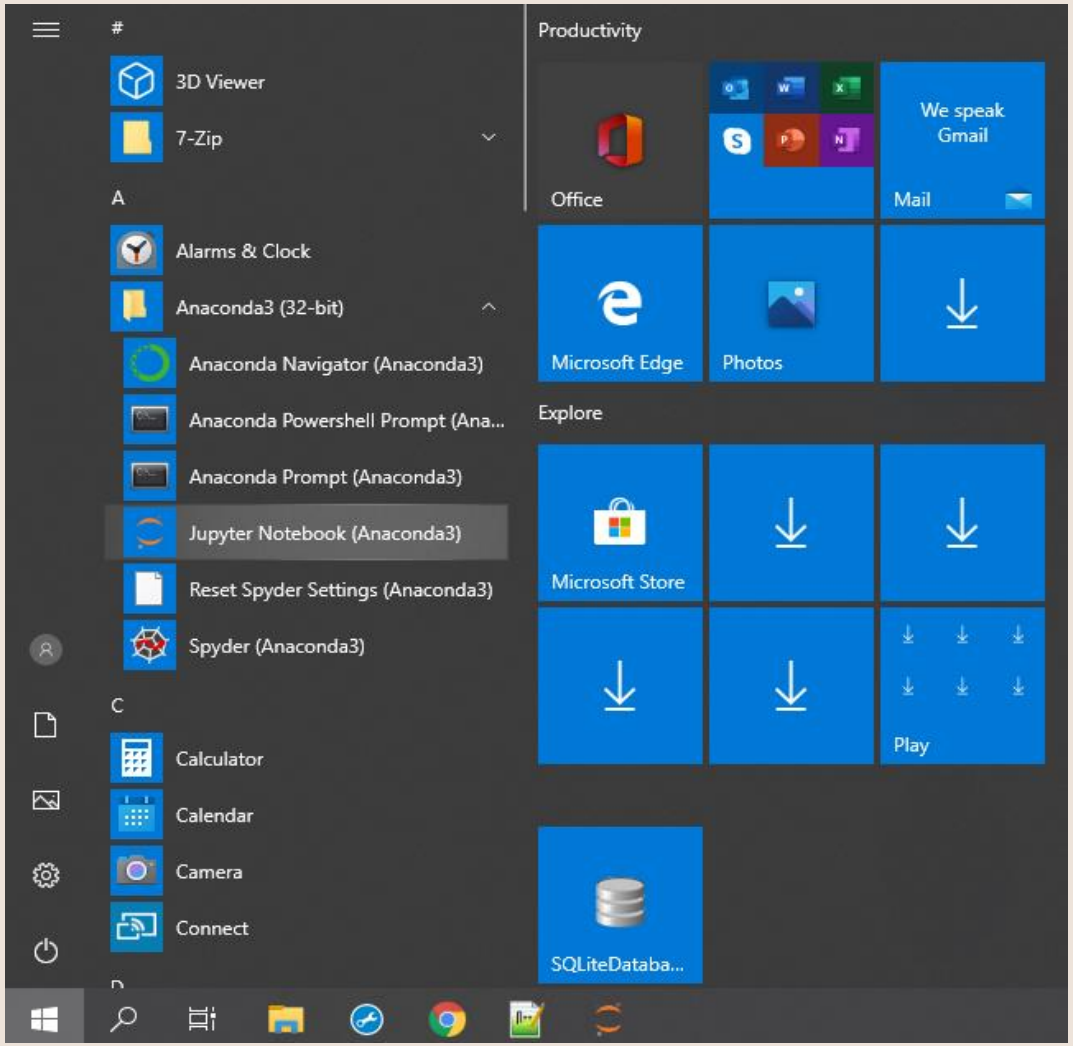
Launch Jupyter Notebook



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