



Master of Science in Applied Data Science: Python Installation Instructions on Windows & macOS



Python Installation Instructions

Python is supported on a range of operating systems. In general, Linux and macOS have Python pre-installed. For other operating systems like Windows, Python can be downloaded from the website (<https://www.python.org/downloads/>).

For this course, we will install Python through an open source data science package management system called conda. It is developed by Anaconda, Inc. and runs on Windows, macOS and Linux.

Python has two versions:

- Python 2.x
- Python 3.x

Of these two, Python 2 is older and is no longer supported or maintained by Python.org. So, we will use the latest stable version of Python 3 that comes with the conda installer.

There are two types of conda installers:

Anaconda	A full setup with IDE, GUI, CLI and scientific packages	Needs 3GB+ disk space
Miniconda	Minimal installer with conda, Python and dependencies	Needs 400MB disk space

We recommend downloading **Miniconda** for its lean setup, it contains all the essential tools required for this course. Additional Python packages can be easily installed using the conda or pip package managers.

To download Miniconda, visit the url: <https://docs.conda.io/en/latest/miniconda.html>

Choose the installation file by

- your operating system - Windows or macOS



- your computer's CPU bit size - 32 or 64 bit (most present day computers are 64 bit)
- Python 3.x version

Python version	Name	Size
Python 3.7	Miniconda3 Windows 64-bit	51.6 MiB
	Miniconda3 Windows 32-bit	52.2 MiB
Python 2.7	Miniconda2 Windows 64-bit	50.9 MiB
	Miniconda2 Windows 32-bit	48.7 MiB

Once you have the installation file downloaded to your computer, follow the below operating system specific instructions.

Installation Steps: WINDOWS OS

- The first step is to verify if your computer already has Python installed. Here's a simple way to check that:
 - Open Command Prompt from the Windows Start menu
 - Type `python --version` and press Enter
 - If Python is installed, a version number will be returned
 - If Python is not installed, a blank line will appear

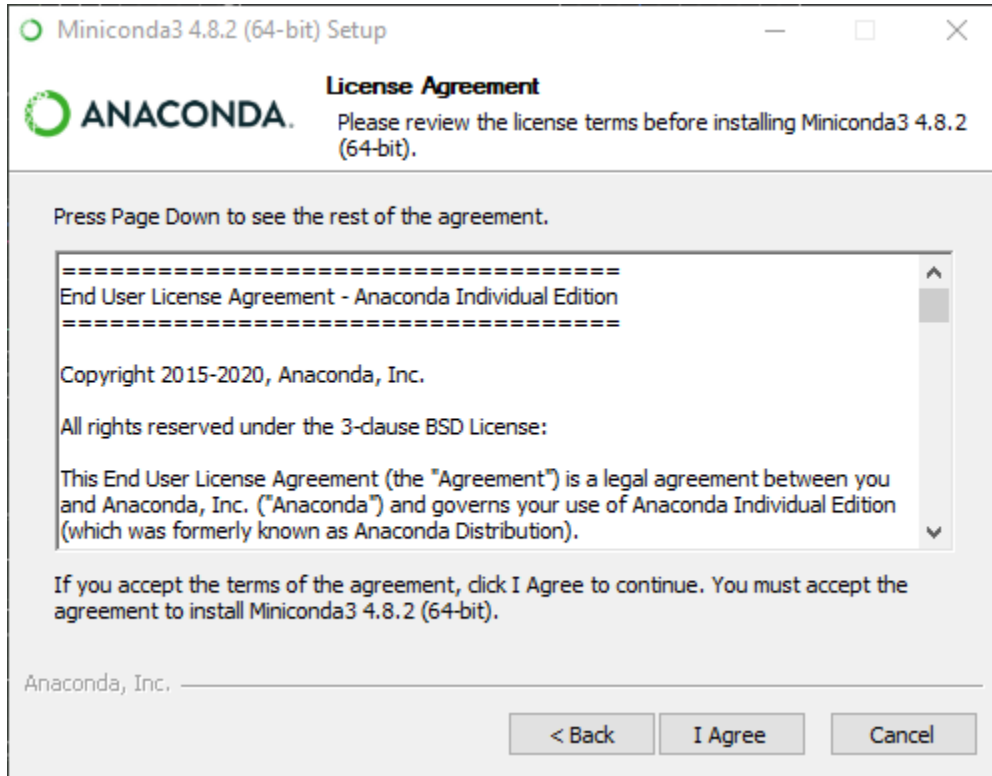
```
C:\>python --version  
C:\>
```

- Remember this, as it will be useful later during Miniconda installation
- Now open the Miniconda installation file that you have downloaded to your computer

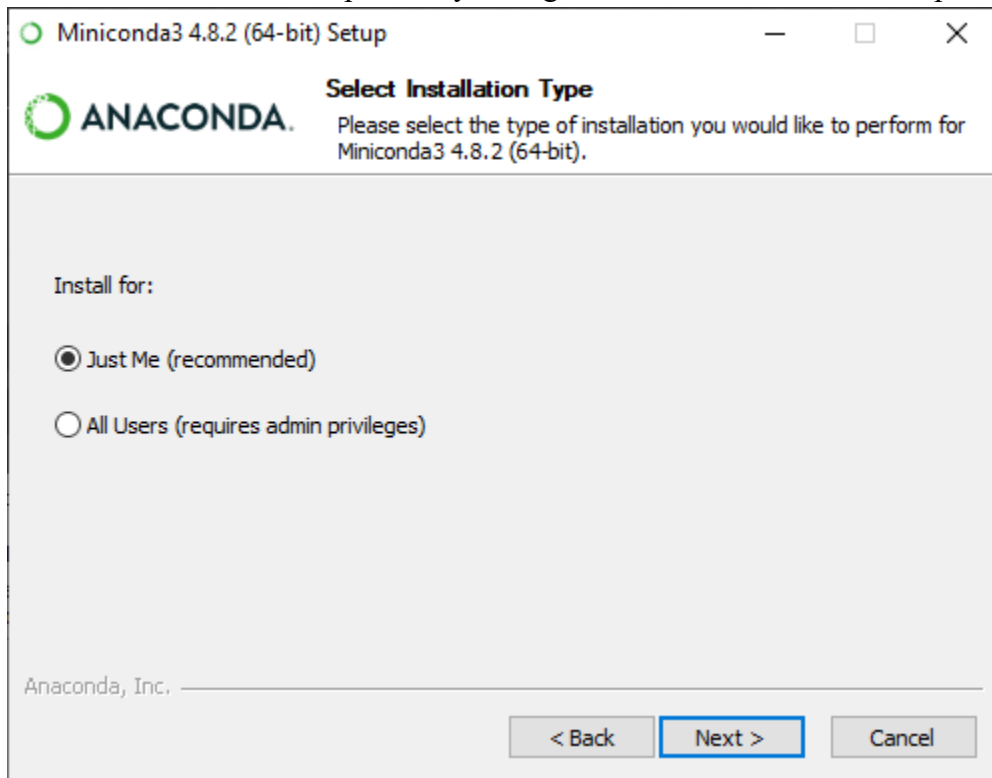
- A setup guide window will appear (similar to the below image), click *Next*.



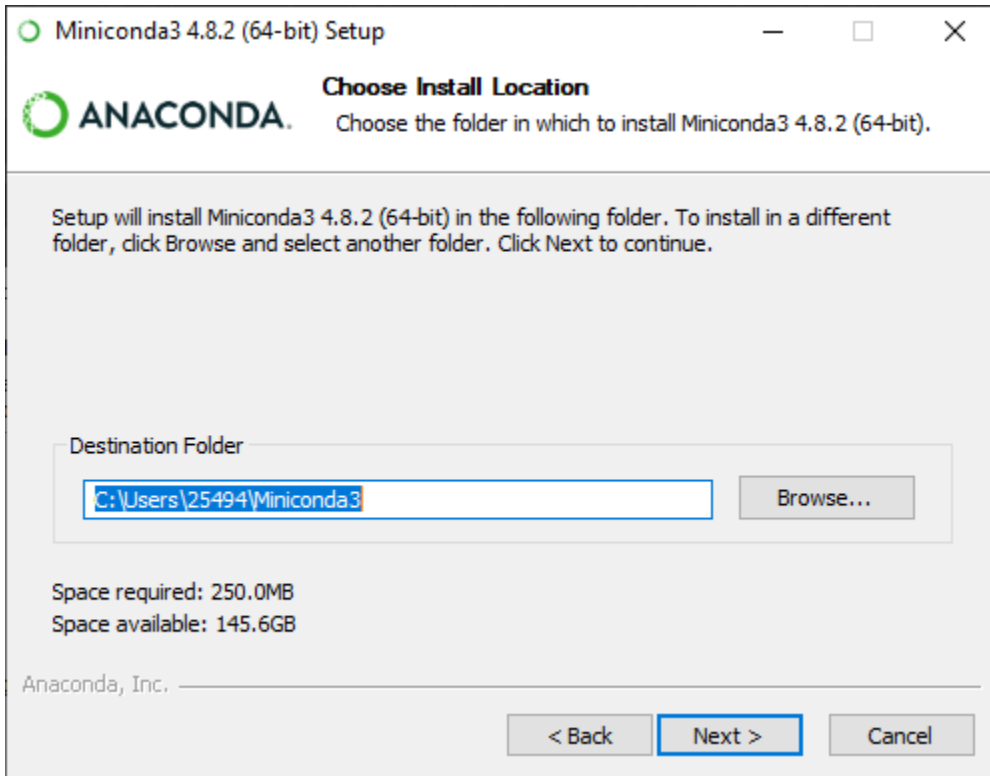
- Click *I Agree* on the license agreement window and proceed to the next window.



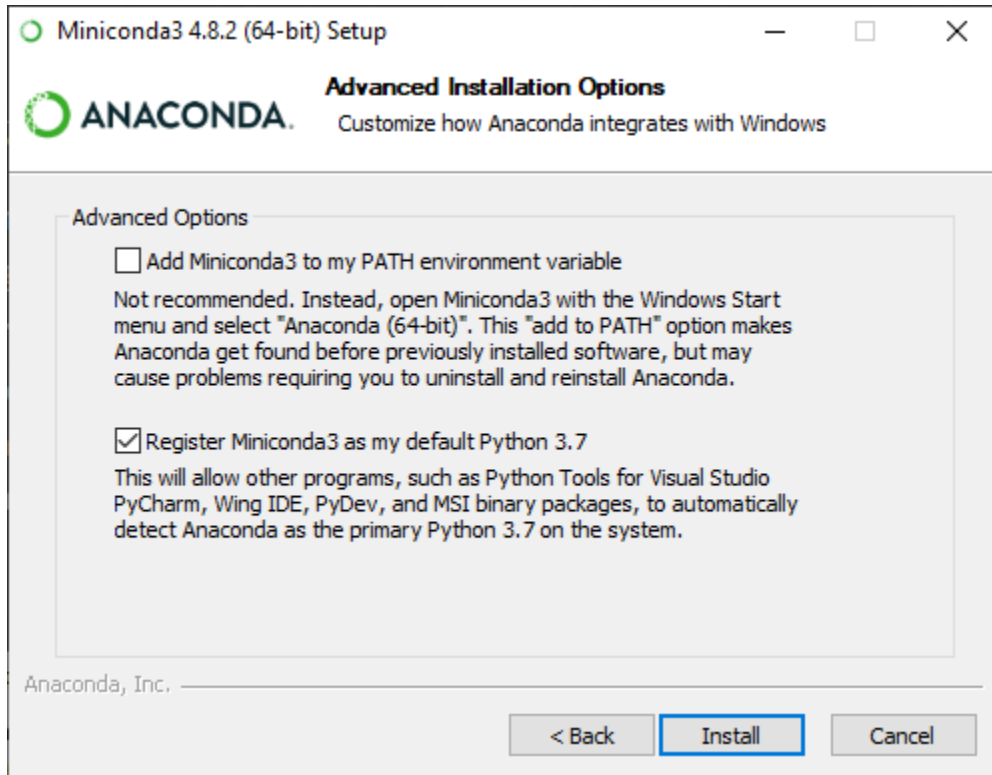
- Choose the *Just Me* option on *Install for* window. This is important if you are installing Miniconda on a work computer as you might not have the administrator privileges.



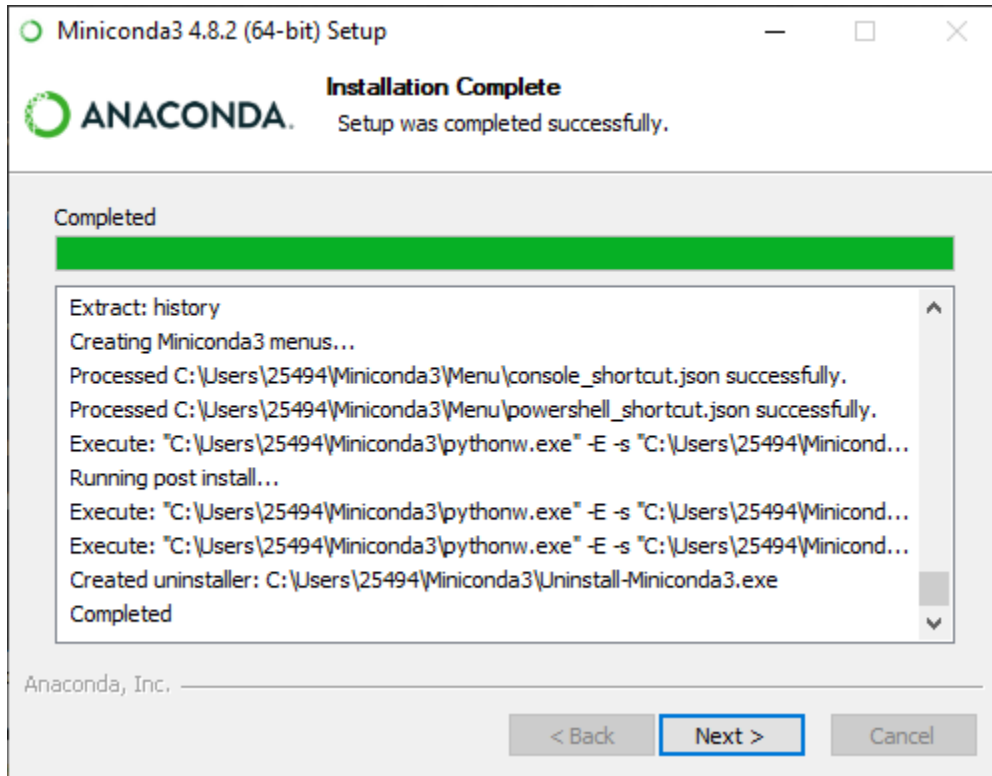
- Select the installation folder for Miniconda, we recommend the default option at: `C:\Users\<your-username>\Anaconda3`. Make sure not to have spaces in your filepath.



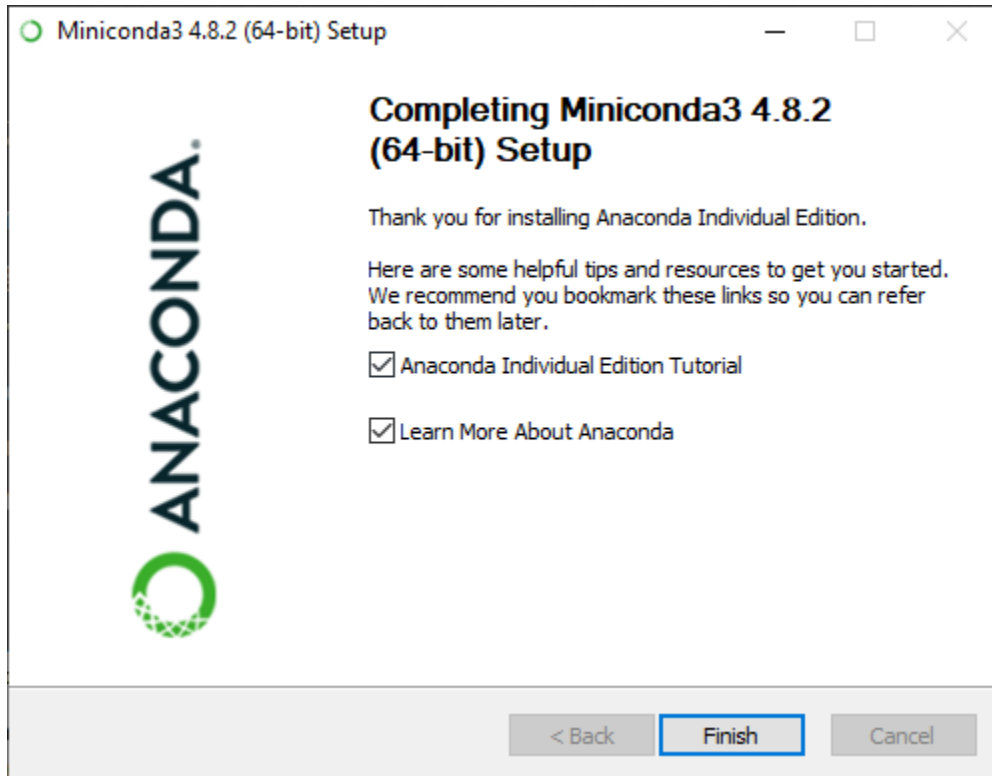
- The next step is an important part of the installation process.
 - Keep the first option “Add Miniconda3 to my PATH environment variable” unchecked. You can always add Miniconda to the PATH at a later time if you find it necessary to use conda from your Command Prompt, Powershell or GIT Bash. For now you can use the CLI prompt provided by Miniconda.
 - The second option “Register Miniconda3 as my default Python” is selected by default. You can keep this selected if this is your first Python installation and if you want to use this Python version in other applications. If you already have Python pre-installed and using it for other applications, then you might want to uncheck this option as well.



- The next window will install Python, conda and other required dependencies. This might take 1-2 minutes. Proceed to the *Next* window once installation is complete.



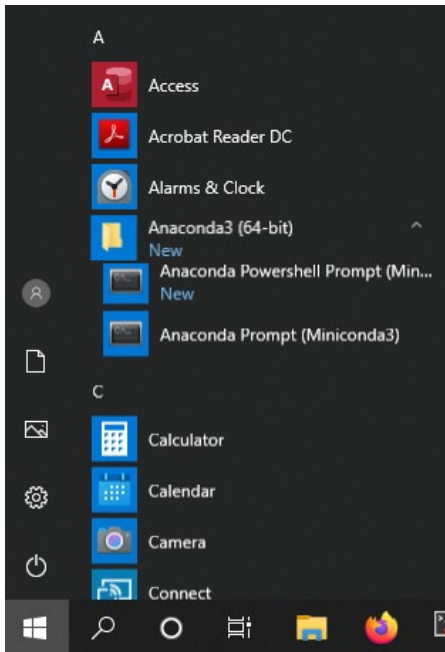
- Click *Finish* and exit setup. You can refer to the resources or opt out based on your preference.



- Optionally, you can restart your computer now.

Verify Installation:

- Open Anaconda prompt from Windows Start menu.



- Enter `conda list`. If conda is installed and working, this will display a list of installed packages and their versions.

```
Anaconda Prompt (Miniconda3)
(base) C:\>conda list
# packages in environment at C:\Users\25494\Miniconda3:
#
# Name                    Version           Build    Channel
asn1crypto                1.3.0             py37_0
ca-certificates           2020.1.1          0
certifi                   2019.11.28       py37_0
cffi                       1.14.0           py37h7a1dbc1_0
chardet                   3.0.4            py37_1003
conda                     4.8.2            py37_0
conda-package-handling    1.6.0            py37h62dcd97_0
console_shortcut          0.1.1            4
cryptography              2.8               py37h7a1dbc1_0
idna                      2.8               py37_0
menuinst                  1.4.16           py37he774522_0
openssl                   1.1.1d           he774522_4
pip                       20.0.2           py37_1
powershell_shortcut      0.0.1            3
pycosat                   0.6.3            py37he774522_0
pyparser                  2.19             py37_0
pyopenssl                 19.1.0           py37_0
pysocks                   1.7.1            py37_0
python                    3.7.6            h60c2a47_2
pywin32                   227              py37he774522_1
requests                  2.22.0           py37_1
ruamel_yaml               0.15.87          py37he774522_0
setuptools                 45.2.0           py37_0
six                       1.14.0           py37_0
sqlite                    3.31.1           he774522_0
```



- Enter the command `python`. This command runs the Python shell. If conda is installed and working, the version information it displays when it starts up will include *Anaconda*. To exit the Python shell, enter the command `quit()`.

```
Anaconda Prompt (Miniconda3)
(base) C:\>python
Python 3.7.6 (default, Jan  8 2020, 20:23:39) [MSC v.1916 64 bit (AMD64)]
:: Anaconda, Inc. on win32
Type "help", "copyright", "credits" or "license" for more information.
>>> print("Hello World!")
Hello World!
>>> quit()
```

Create New Environment:

- With conda, you can create, export, list, remove, and update environments that have different versions of Python and/or packages installed in them. The packages used in an environment are bound to that environment and will not affect other projects. Switching or moving between environments is called activating the environment.
- To create a basic environment for your course, use the command `conda create --name <environment name>`
For example: `conda create --name ADS500B`
- When conda asks you to `proceed ([y]/n)?`, type `y` for yes.
- To use this environment, it needs to be activated with the command: `conda activate ADS500B`. You will notice that the environment switches from *base* to the newly activated *ADS500B*.

```
(base) C:\>conda activate ADS500B
(ADS500B) C:\>
```

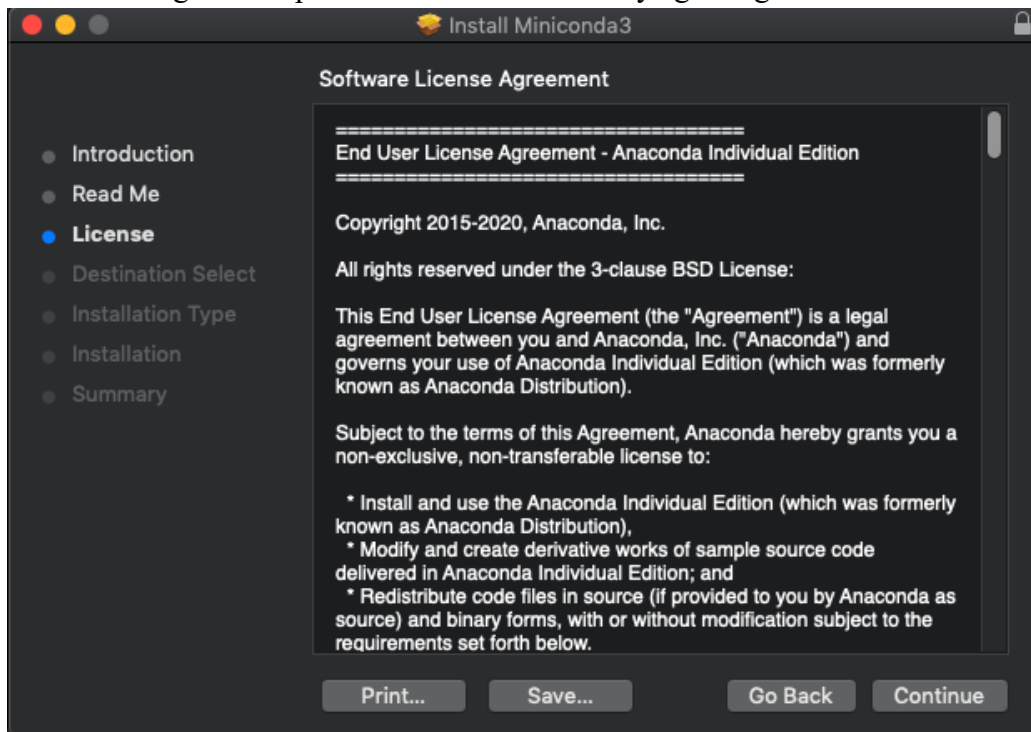
- Use `conda deactivate` to deactivate the environment after use. The environment name is not required for deactivation. But before you do that, let us install Jupyter within our environment and test Python in a Jupyter notebook. To do that follow the instructions in the Jupyter installation document.

Installation Steps: macOS

- Miniconda has two types of installation files for macOS:
 - Package file (.pkg) for GUI based installation
 - Shell file (.sh) for installation through Terminal
- Download either of these file types based on your preference.

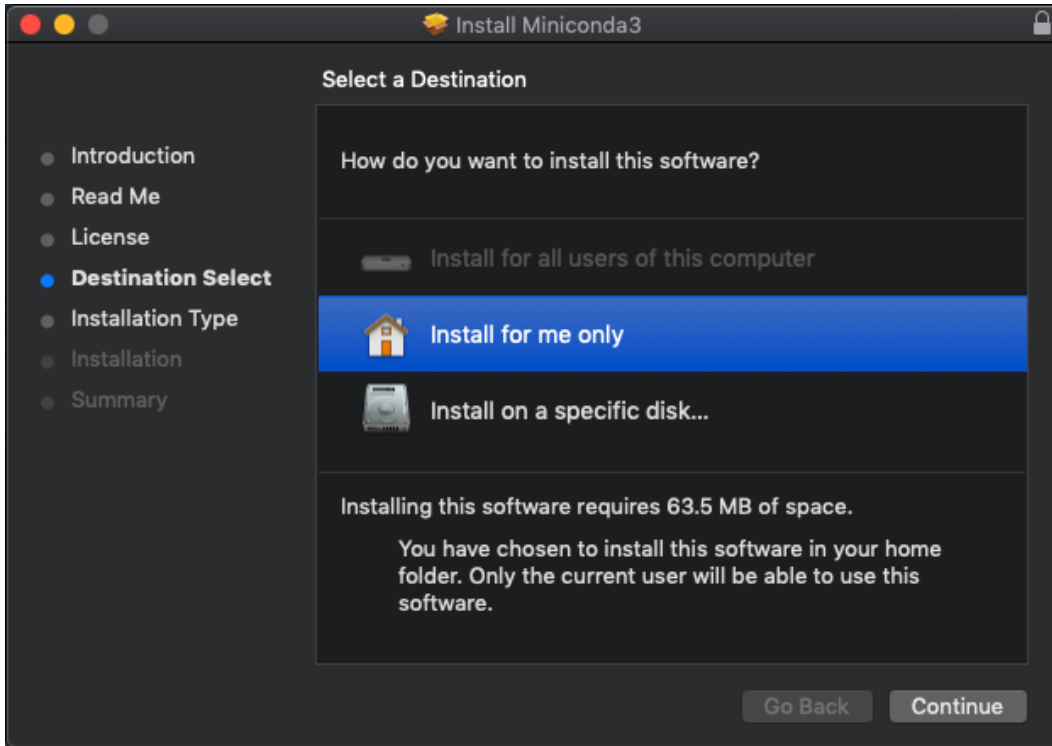
Package File Installation (GUI):

- Open the installer file you have downloaded to your computer.
- Follow through the steps on the installer screen by agreeing to the license terms.

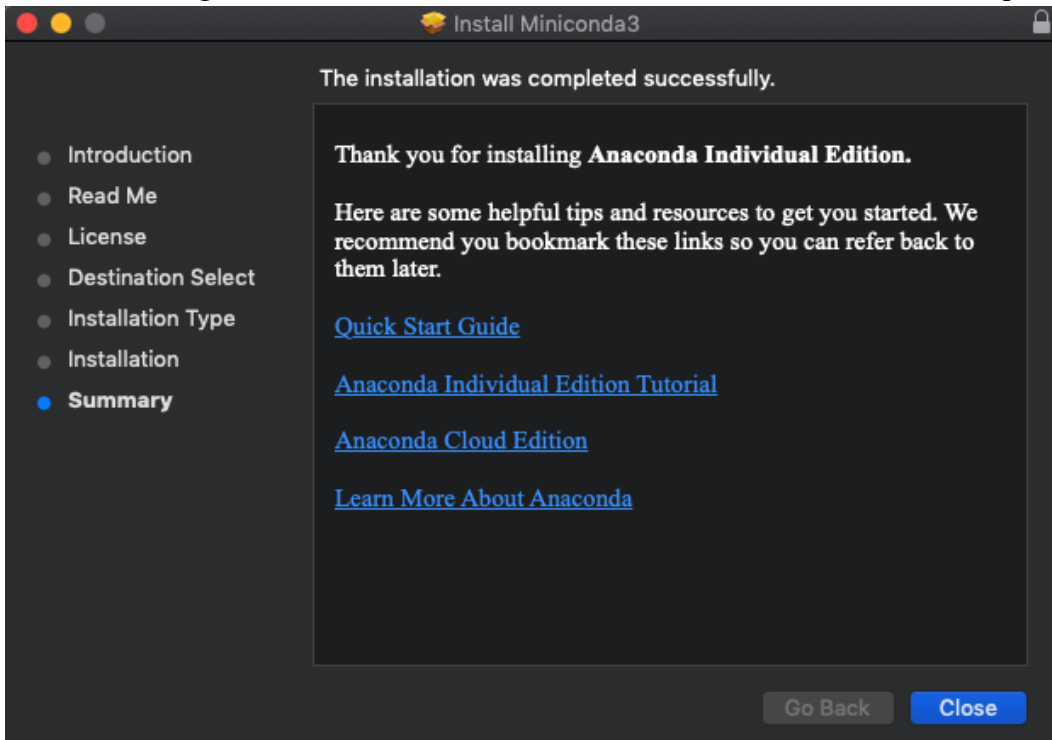


- Choose the default option *Just Me* on the Destination select window, this is important if you do not have the administrator privileges for the computer. The default installation

path for GUI based installation is at `/Users/<your-username>/opt` folder.



- Continue through the installation, and close the installation window once complete.





Shell File Installation (CLI):

- Open the Terminal and navigate to the folder where the installation file is downloaded to.
- Run the bash command followed by the filename like:
`bash Miniconda3-latest-MacOSX-x86_64.sh`
- Follow through the screen prompts and agree to license terms by entering `yes`

```
Welcome to Miniconda3 py37_4.8.3

In order to continue the installation process, please review the license
agreement.
Please, press ENTER to continue
>>> █
```

- Next, select the default installation location by pressing ENTER key. Unlike the .pkg file, the default path for shell installation is at: `/Users/<your-username>`

```
Miniconda3 will now be installed into this location:
/Users/BruceWyne/miniconda3

- Press ENTER to confirm the location
- Press CTRL-C to abort the installation
- Or specify a different location below
```

- The installer prompts “Do you wish the installer to initialize Miniconda3 by running conda init?” Type `yes`.

```
Preparing transaction: done
Executing transaction: done
installation finished.
Do you wish the installer to initialize Miniconda3
by running conda init? [yes|no]
[yes] >>> █
```

- This will make changes to your bash_profile at: `/Users/<your-username>/.bash_profile`. Once the installation is complete, close and reopen the Terminal.

```
==> For changes to take effect, close and re-open your current shell. <==

If you'd prefer that conda's base environment not be activated on startup,
set the auto_activate_base parameter to false:

conda config --set auto_activate_base false

Thank you for installing Miniconda3!
```



Verify Installation:

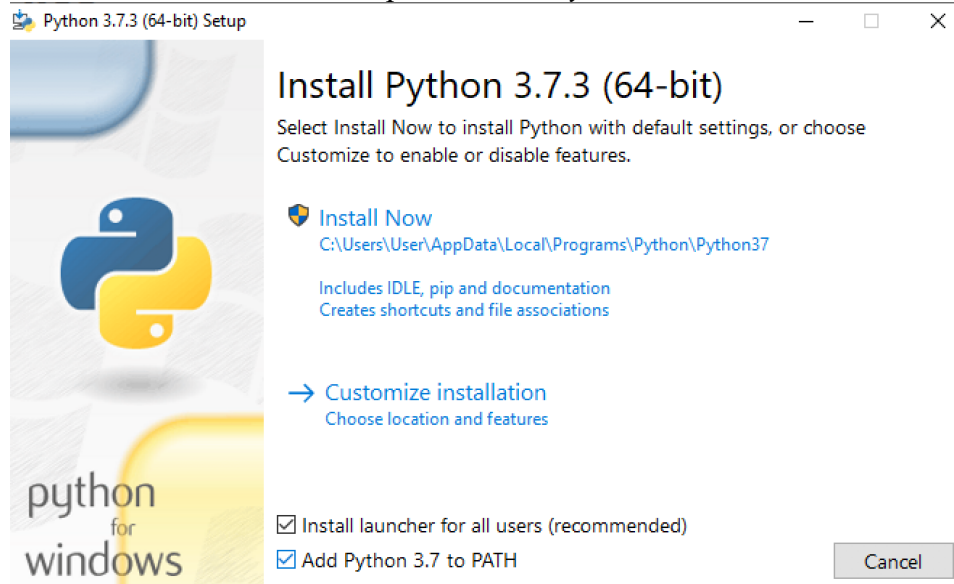
- Whether you have installed Miniconda using GUI (.pkg file) or Terminal (shell file), you need to open the Terminal to verify if conda and Python are installed.
- You might notice a prefix `(base)` before your computer name when you open the Terminal. This means conda's base environment is activated. If not, you can activate it with the command: `conda activate base`
- Let's confirm this by typing `conda env list`, which displays the list of environments, and your current environment will be highlighted with an asterisk (*).
- Next, type `python --version` to verify the version of python installed through Miniconda, which should be Python 3.x. Most macOS computers come pre-installed with a 2.7 version of Python.
- To exit out of your base environment, type: `conda deactivate`
- The conda base environment will be auto activated every time you open the Terminal. As we will be creating a different environment for our course, you might want to turn the auto activation off with the command: `conda config --set auto_activate_base false`

Create New Environment:

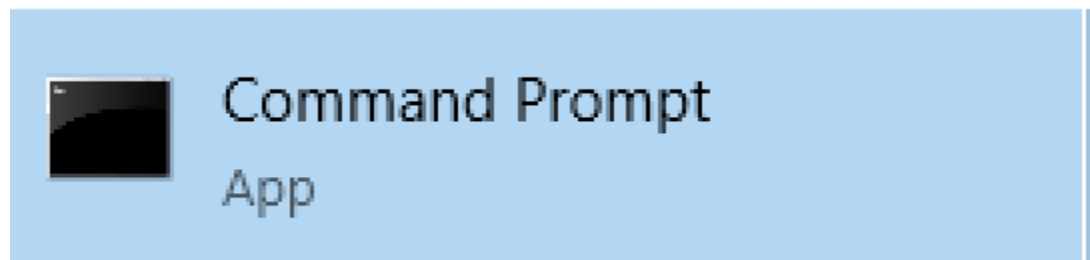
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- When conda asks you to `proceed ([y]/n)?`, type `y` for yes
- To use this environment, it needs to be activated with the command: `conda activate ADS500B`. You will notice the prefix `(ADS500B)` when the environment is activated.
- Use `conda deactivate` to deactivate the environment after use. The environment name is not required for deactivation. But before you do that, let us install Jupyter within our environment and test Python in a Jupyter notebook.

Python installation without Anaconda (Windows 10)

1. Apart from this course, you can install Python directly without using Anaconda package manager.
 - a. Download the latest Python 3 release from <https://www.python.org/>. Choose either the *web-based installer* or the *executable installer*.
 - b. Run the installer. Select the option to *Add Python 3.x to PATH*.



2. Install Python packages using *pip*
 - a. Open a *Command Prompt* window



- b. For example, enter the following command to install NumPy package:
`pip install numpy`
This will download and install the package.