

Master of Science in Applied Data Science: Python Installation Instructions on Windows & macOS python^{**}

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: <u>https://docs.conda.io/en/latest/miniconda.html</u> 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
 - $\circ~$ If Python is installed, a version number will be returned
 - If Python is not installed, a blank line will appear



- 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.

O Miniconda3 4.8.2 (64-bit) S	etup	-		×
O ANACONDA.	Welcome to Miniconda (64-bit) Setup Setup will guide you through the insta 4.8.2 (64-bit). It is recommended that you dose all of before starting Setup. This will make if relevant system files without having to computer. Click Next to continue.	IS 4.8.2	2 /iniconda3 cations to update our	1
	Ne	xt >	Cance	3I



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

O Miniconda3 4.8.2 (64-bit) Setup		—		\times
O ANACONDA.	License Agreem Please review the (64-bit).	ent license terms b	efore installing M	iiniconda3	4.8.2
Press Page Down to see th	e rest of the agreen	nent.			
End User License Agreeme	nt - Anaconda Indiv	idual Edition			^
Copyright 2015-2020, Ana	conda, Inc.				
All rights reserved under t	ne 3-dause BSD Lice	ense:			
This End User License Agre and Anaconda, Inc. ("Ana (which was formerly known	ement (the "Agreer conda") and govern n as Anaconda Distri	nent") is a legal a s your use of An ibution).	agreement betwe aconda Individua	een you al Edition	~
If you accept the terms of agreement to install Minicor	the agreement, did nda3 4.8.2 (64-bit).	I Agree to cont	inue. You must a	ccept the	
Anaconda, Inc					
		< Back	I Agree	Can	cel



• 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.

O Miniconda3 4.8.2 (64-bit) Setup	_		×	
O ANACONDA.	Select Installation Type Please select the type of installation you would like to perform for Miniconda3 4.8.2 (64-bit).				
Install for: () Just Me (recommended))				
○ All Users (requires admi	n privileges)				
Anaconda, Inc. ————	< Back	Next >	Can	cel	



• 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.

O Miniconda3 4.8.2 (64-bit	t) Setup		_		×
O ANACONDA.	Choose Install I Choose the folde	L ocation r in which to install I	Miniconda3 4.	8.2 (64-bit	t).
Setup will install Miniconda folder, click Browse and se	3 4.8.2 (64-bit) in th lect another folder.	e following folder. T Click Next to contini	īo install in a c ue.	lifferent	
Destination Folder C: \Users\25494\Minico	onda3		Bro	WSE]
Space required: 250.0MB Space available: 145.6GB					
Anaconda, Inc. ————		< Back	Next >	Cano	el

- 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.



O Miniconda3 4.8.2 (64-bit) Setup	_		×
O ANACONDA.	Advanced Installation Options Customize how Anaconda integrates wi	ith Windows		
Advanced Options				
Add Miniconda3 t	o my PATH environment variable			
Not recommended. I menu and select "An Anaconda get found cause problems requ ☑ Register Minicond This will allow other p PyCharm, Wing IDE, detect Anaconda as	nstead, open Miniconda3 with the Window aconda (64-bit)". This "add to PATH" optio before previously installed software, but iring you to uninstall and reinstall Anacond la3 as my default Python 3.7 orograms, such as Python Tools for Visual 3 PyDev, and MSI binary packages, to auto the primary Python 3.7 on the system.	is Start n makes may la. Studio matically		
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• 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.

O Miniconda3 4.8.2 (64-bit)) Setup — 🗆	\times
O ANACONDA.	Installation Complete Setup was completed successfully.	
Completed		
Extract: history Creating Miniconda3 menu Processed C:\Users\2549 Processed C:\Users\2549 Execute: "C:\Users\25494 Running post install Execute: "C:\Users\25494 Execute: "C:\Users\25494 Created uninstaller: C:\Users\25494 Created uninstaller: C:\Users\25494	Js 4\Miniconda3\Menu\console_shortcut.json successfully. 4\Miniconda3\Menu\powershell_shortcut.json successfully. 4\Miniconda3\pythonw.exe" -E -s "C:\Users\25494\Minicond 4\Miniconda3\pythonw.exe" -E -s "C:\Users\25494\Minicond a\Miniconda3\pythonw.exe" -E -s "C:\Users\25494\Minicond sers\25494\Miniconda3\Uninstall-Miniconda3.exe	^
Anaconda, Inc	< Back Next > Cano	el



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

O Miniconda3 4.8.2 (64-bit)	Setup	_		\times
O ANACONDA.	Completing Minicone (64-bit) Setup Thank you for installing Anaconda Here are some helpful tips and re We recommend you bookmark the back to them later. Anaconda Individual Edition Tu Learn More About Anaconda	da3 4.8.2 a Individual Edii sources to get ese links so you utorial	tion. you start	ted. er
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• Optionally, you can restart your computer now.

Verify Installation:

• Open Anaconda prompt from Windows Start menu.



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	Access
	Acrobat Reader DC
	Alarms & Clock
	Anaconda3 (64-bit)
8	Anaconda Powershell Prompt (Min New
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	Calculator
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• Enter conda list. If conda is installed and working, this will display a list of installed packages and their versions.

🔳 Anaconda Prompt (Miniconda	3)		_		×
(base) (:))conde list					^
# packages in environmen	t at C:\Usans\2	E494\Miniconda3:			
# packages in environmen		.5454 (MINICONDAS.			
# Name	Version	Build	Chann	പ	
asn1crvpto	1.3.0	pv37 0	chann		
ca-certificates	2020.1.1	p;;;_0			
certifi	2019.11.28	pv37 0			
cffi	1.14.0	pv37h7a1dbc1 0			
chardet	3.0.4	py37 1003			
conda	4.8.2	pv37 0			
conda-package-handling	1.6.0	pv37h62dcd97_0			
console shortcut	0.1.1	4			
cryptography	2.8	pv37h7a1dbc1 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			
pycparser	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			
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• 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 guit().

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*.



• 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.

	💝 Install Miniconda3	
	Select a Destination	
IntroductionRead Me	How do you want to install this software?	
 License Destination Select 	Install for all users of this computer	
 Installation Type Installation 	nstall for me only	
	Install on a specific disk	
	Installing this software requires 63.5 MB of space.	
	You have chosen to install this software in your home folder. Only the current user will be able to use this software.	
	Go Back Continue	I

• 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!</pre>
```



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:

- 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 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 <u>https://www.python.org/</u>. Choose either the *web-based installer* or the *executable installer*.



- 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.