

# Qiskit Installation Guide

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## Requirements

Qiskit supports Python 3.6 or later. However, both Python and Qiskit are evolving ecosystems, and sometimes when new releases occur in one or the other, there can be problems with compatibility.

If you're having trouble installing or using Qiskit after updating Python, check the [Qiskit Package metadata](#) for **Programming Language** to see which specific versions of Python are supported.

We recommend installing [Anaconda](#), a cross-platform Python distribution for scientific computing. Jupyter, included in Anaconda, is recommended for interacting with Qiskit.

Qiskit is tested and supported on the following 64-bit systems:

- Ubuntu 16.04 or later
- macOS 10.12.6 or later
- Windows 7 or later

We recommend installing [Anaconda](#), a cross-platform Python distribution for scientific computing. Jupyter, included in Anaconda, is recommended for interacting

with Qiskit.

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## Steps for Jupyter Notebook Installation:

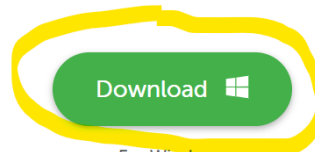
### ▼ Jupyter Notebook on Windows:

#### Installing Jupyter Notebook using Anaconda:

- Make sure to have python version 3.7 or above.
- Download anaconda software from [anaconda.com](https://www.anaconda.com).

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For Windows

Python 3.9 • 64-Bit Graphical Installer • 594 MB

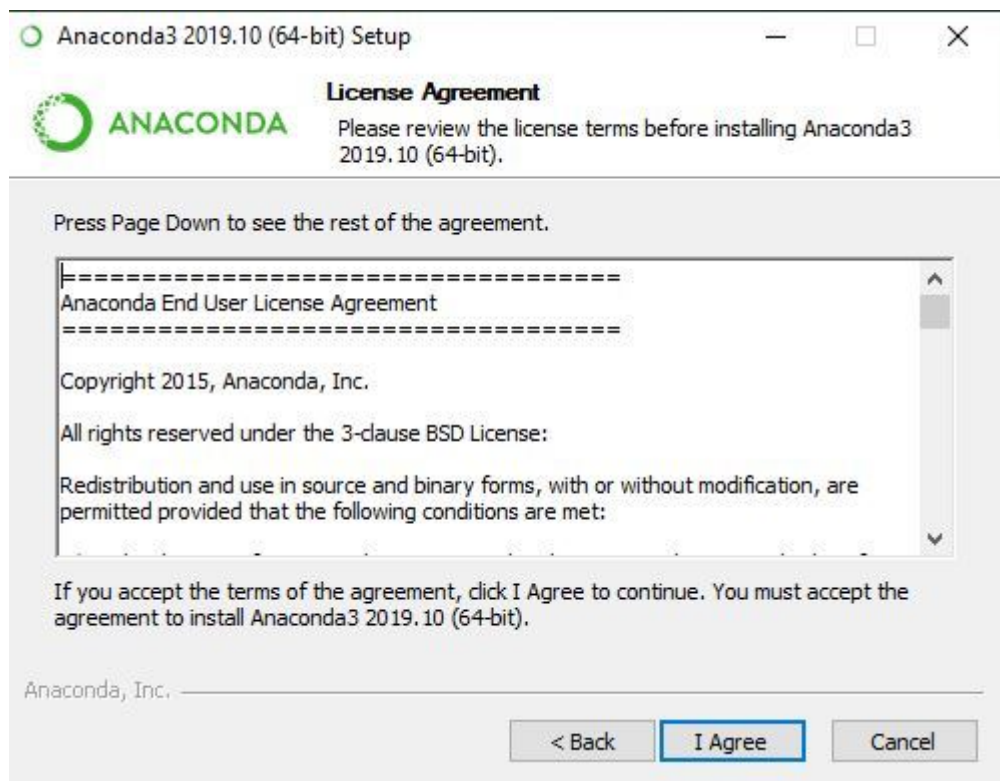
Get Additional Installers



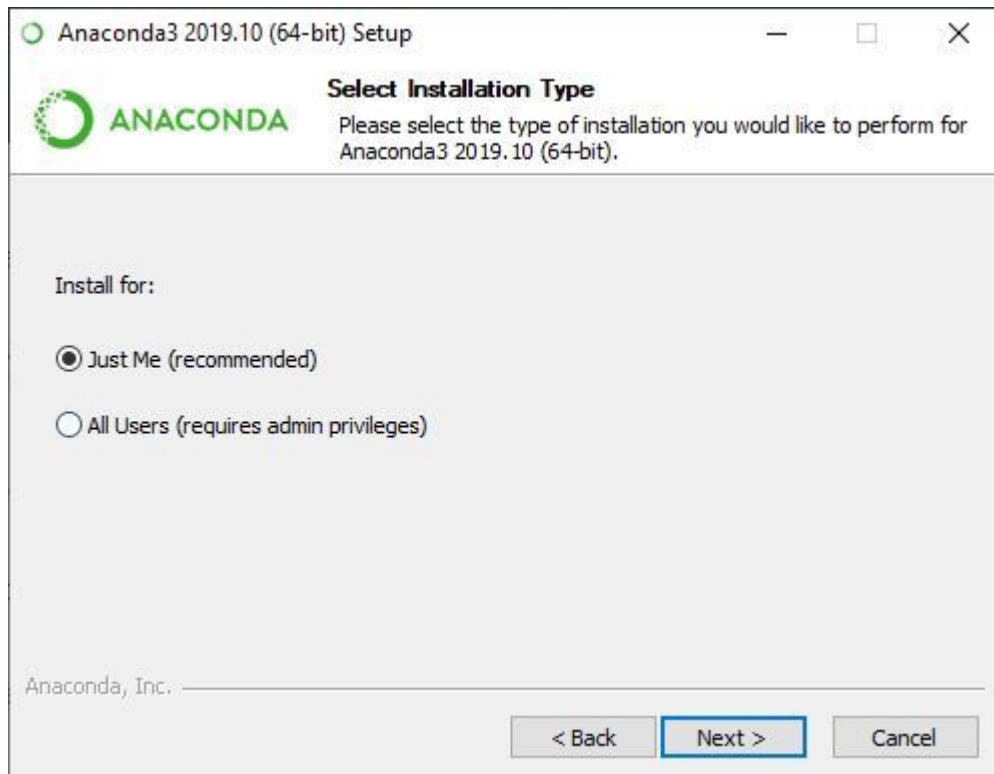
- Getting Started



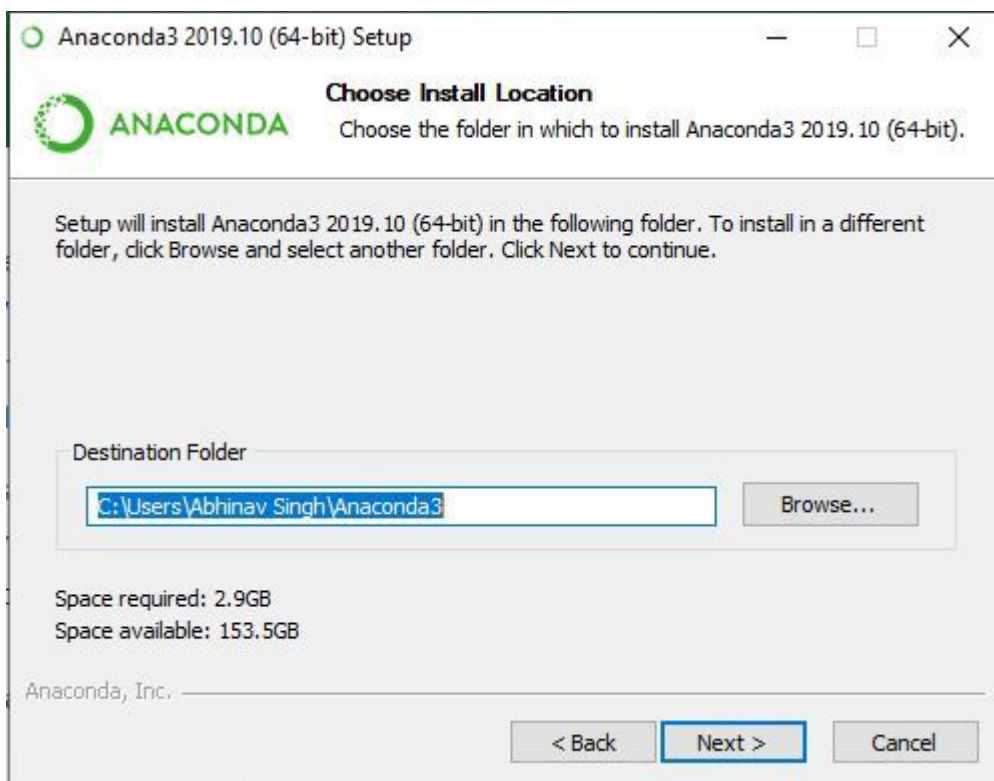
- Getting through the license agreement:



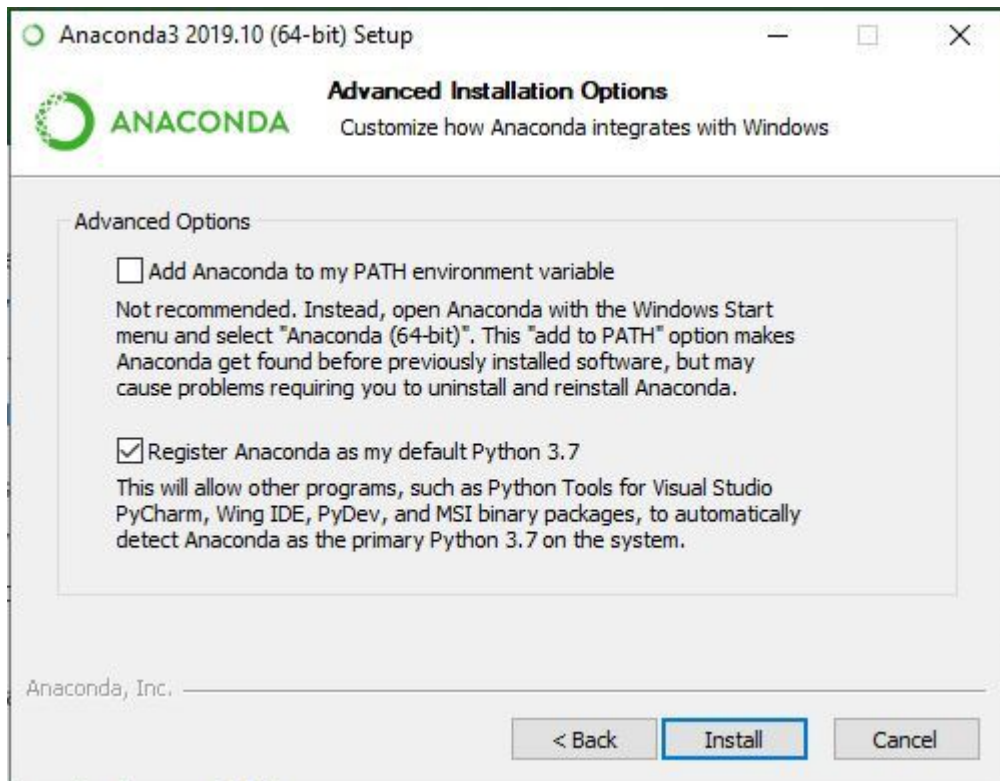
- **Select Installation Type:** Select **Just Me** if you want the software to be used by a single User



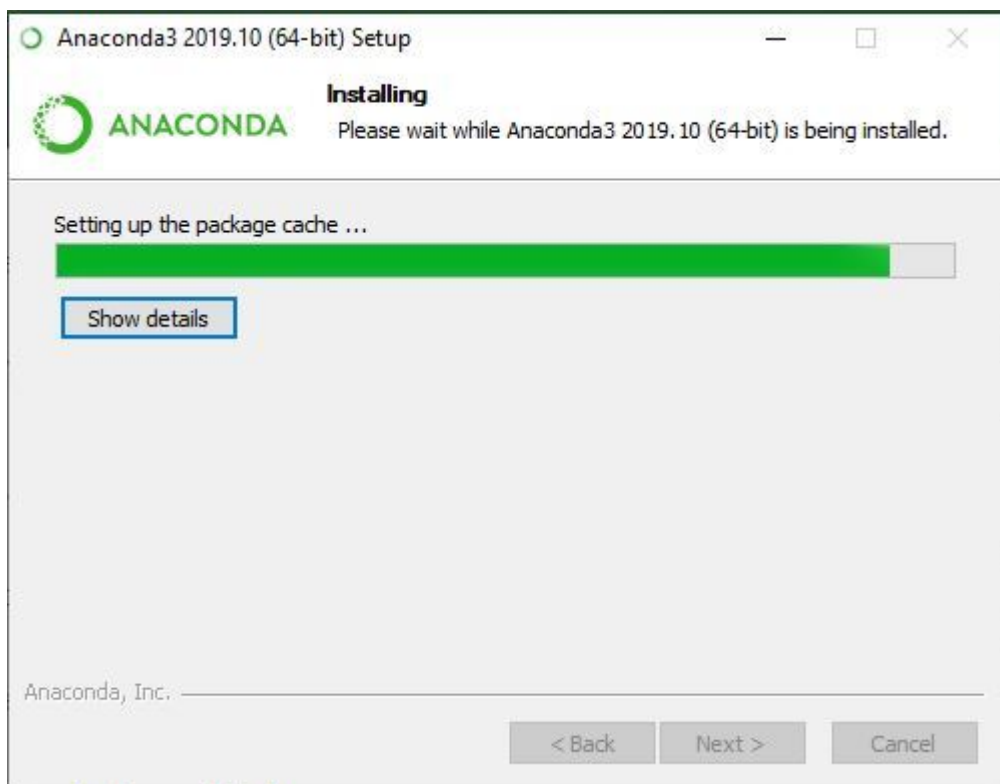
- Choose Installation Location:



- Advanced installation option:



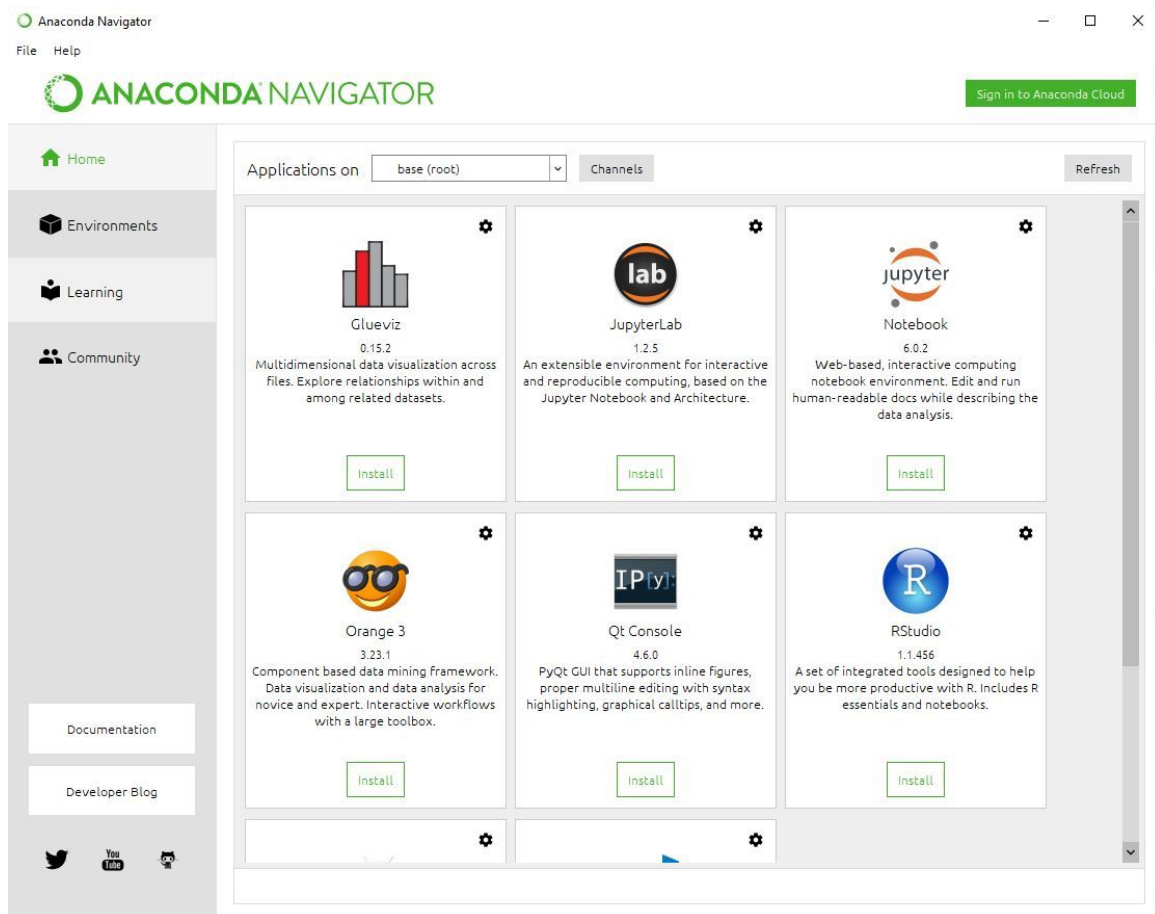
- **Getting through the Installation Process:**



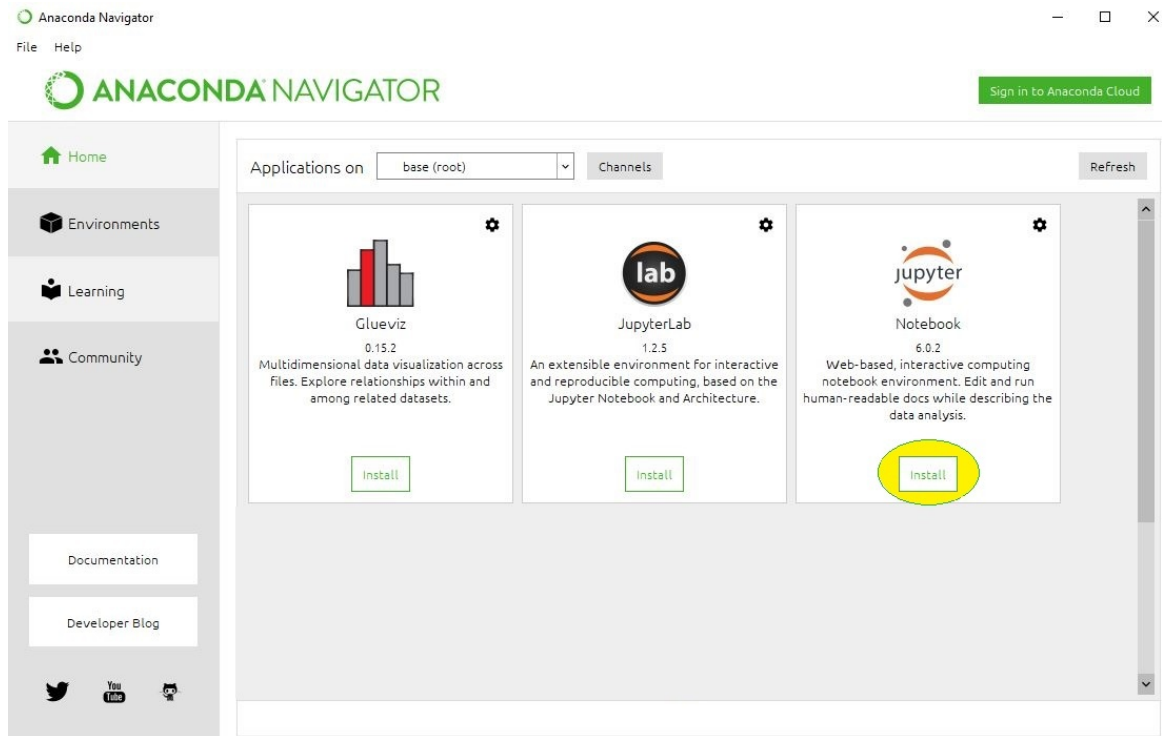
- **Finishing up the Installation:**



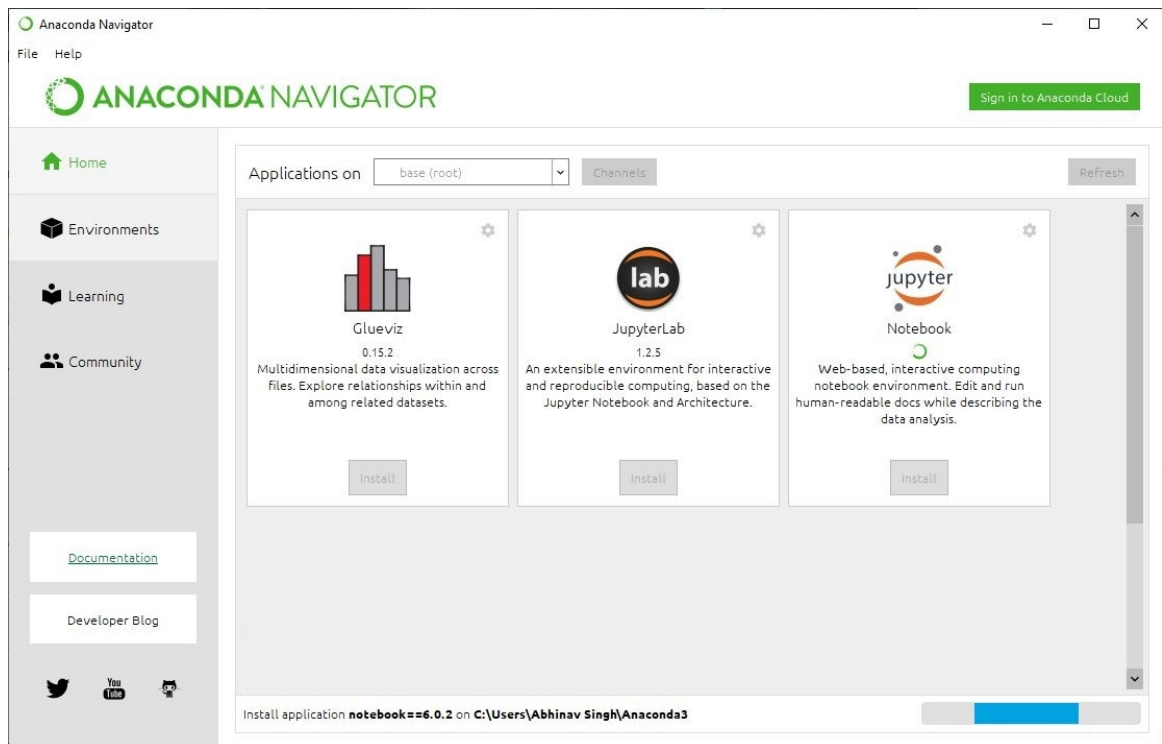
- **Launch Anaconda Navigator:**



- **Click on the Install Jupyter Notebook Button:**

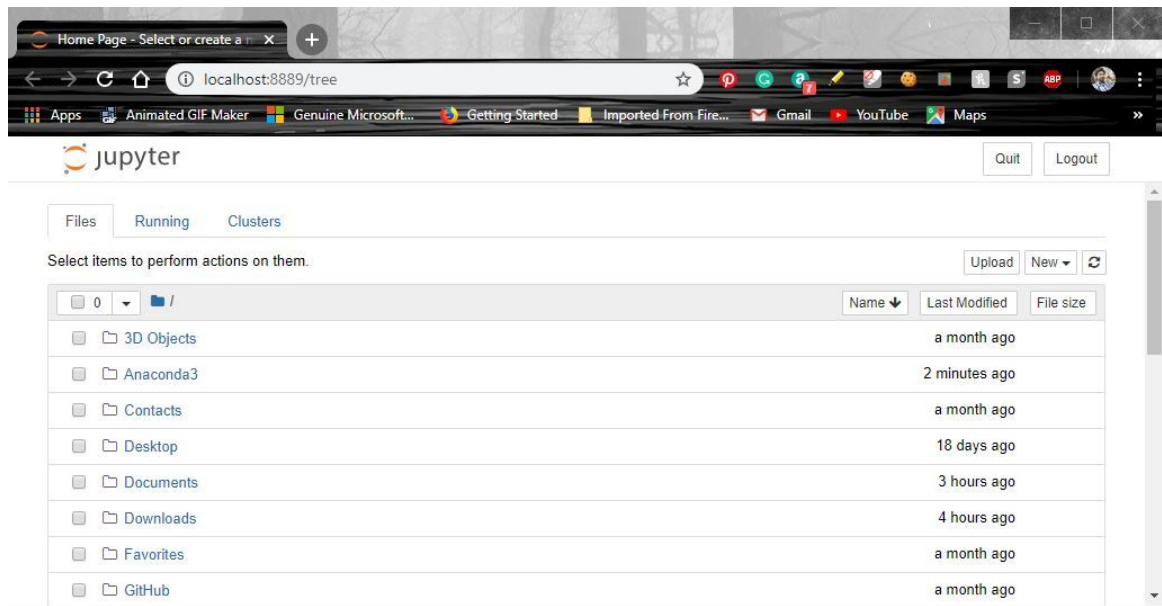


- **Beginning the Installation:**



- **After installing jupyter notebook click on launch to open jupyter notebook**





## Installing Jupyter Notebook using pip:

- Open command prompt and enter - `python -m pip install jupyter`
- While Installing package

```

Command Prompt - python -m pip install jupyter
Requirement already satisfied: more-itertools in c:\users\abhinav singh\anaconda3\lib\site-packages (from zipp>=0.5->importlib-metadata; python_version < "3.8"->jsonschema=2.5.0,>=2.4->nbformat>=4.4->nbconvert->jupyter) (8.0.2)
Building wheels for collected packages: pandocfilters, prometheus-client, backcall
  Building wheel for pandocfilters (setup.py) ... done
  Created wheel for pandocfilters: filename=pandocfilters-1.4.2-cp37-none-any.whl size=7862 sha256=849bce8e4908d819b25c81ed408862aad99063021d407852b57cbfb02e7f881c
  Stored in directory: C:\Users\Abhinav Singh\AppData\Local\pip\Cache\wheels\39\01\56\f1b08a6275acc59e846fa4c1e1b65dbc19f20157d9e66c20
  Building wheel for prometheus-client (setup.py) ... done
  Created wheel for prometheus-client: filename=prometheus_client-0.7.1-cp37-none-any.whl size=41407 sha256=11607fb79180270892bf9c160976b5ca32d012870790efafa28ff792339b158d
  Stored in directory: C:\Users\Abhinav Singh\AppData\Local\pip\Cache\wheels\1c\54\34\fd47cd9b308826cc4292b54449c1899a30251ef3b506bc91ea
  Building wheel for backcall (setup.py) ... done
  Created wheel for backcall: filename=backcall-0.1.0-cp37-none-any.whl size=10418 sha256=76f4f1869e8c47685c7023872dca8fbd94cd44119b1a4324023c65399ff1925e
  Stored in directory: C:\Users\Abhinav Singh\AppData\Local\pip\Cache\wheels\98\b0\dd\29e28ff615af3dda4c67cab719dd51357597eabff926976b45
Successfully built pandocfilters prometheus-client backcall
Installing collected packages: pyzmq, tornado, jupyter-client, wcwidth, prompt-toolkit, backcall, parso, jedi, colorama, pygments, pickleshare, ipython, ipykernel, jupyter-console, pandocfilters, entrypoints, defusedxml, testpath, webencodings, bleach, mistune, nbconvert, qtconsole, Send2Trash, pywinpty, terminado, prometheus-client, notebook, widgetsnbextension, ipywidgets, jupyter
  
```

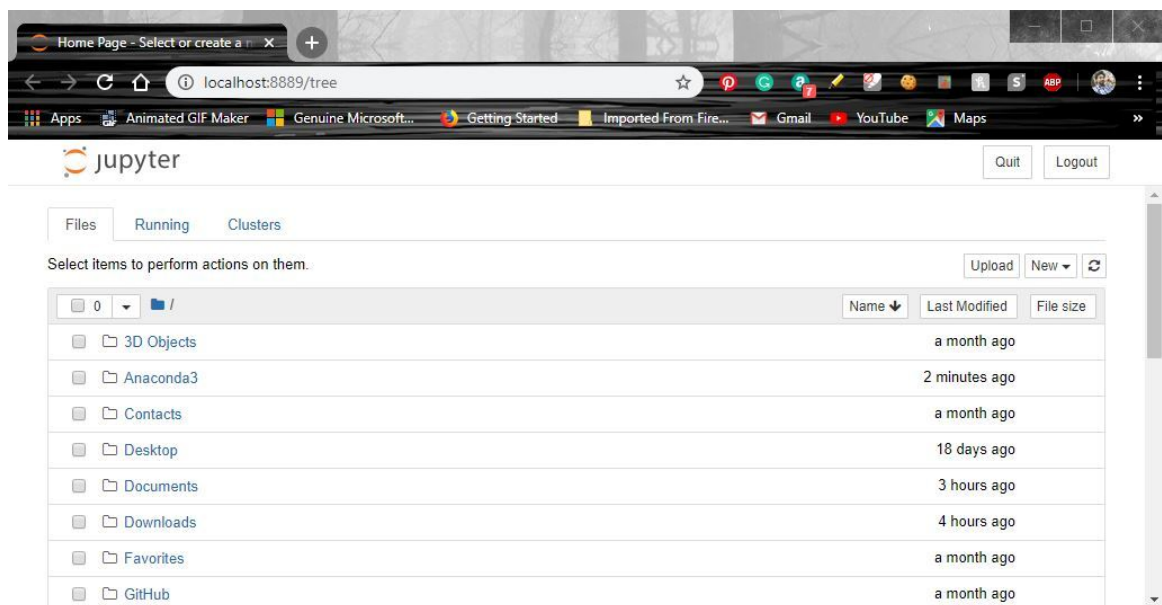
- Run the following command in command prompt to launch Jupyter Notebook - `jupyter notebook`



```
Command Prompt - jupyter notebook
C:\Users\Abhinav Singh>jupyter notebook
[I 17:52:47.792 NotebookApp] Serving notebooks from local directory: C:\Users\Abhinav Singh
[I 17:52:47.792 NotebookApp] The Jupyter Notebook is running at:
[I 17:52:47.792 NotebookApp] http://localhost:8888/?token=325083ca519c9570938f8b852606778d5cd7100fc5491f4d
[I 17:52:47.792 NotebookApp] or http://127.0.0.1:8888/?token=325083ca519c9570938f8b852606778d5cd7100fc5491f4d
[I 17:52:47.792 NotebookApp] Use Control-C to stop this server and shut down all kernels (twice to skip confirmation).
[C 17:52:47.825 NotebookApp]

To access the notebook, open this file in a browser:
file:///C:/Users/Abhinav%20Singh/AppData/Roaming/jupyter/runtime/nbserver-4908-open.html
Or copy and paste one of these URLs:
http://localhost:8888/?token=325083ca519c9570938f8b852606778d5cd7100fc5491f4d
or http://127.0.0.1:8888/?token=325083ca519c9570938f8b852606778d5cd7100fc5491f4d
```

Jupyter Notebook will open in browser



## ▼ Jupyter Notebook on Ubuntu:

### Installing Jupyter Notebook using Anaconda:

- Make sure to have python version 3.7 or above.
- Download anaconda software from [anaconda.com](https://www.anaconda.com).

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For Linux

Python 3.9 • 64-Bit (x86) Installer • 659 MB

Get Additional Installers



Have you registered  
webinar? 🤖

- Open terminal in the downloaded location and enter the command : `bash`  
`Anaconda3-2022.05-Linux-x86_64.sh`
- Press Enter many times, till you read all terms and condition. Then you will be prompt to write 'yes' to accept all the terms and conditions.

```
sandeep@sandeep-Inspiron-5559: ~/Downloads
g any encryption software, please check your country's laws, regulations and pol
cies concerning the import, possession, or use, and re-export of encryption sof
ware, to see if this is permitted. See the Wassenaar Arrangement http://www.was
senaar.org/ for more information.

Anaconda has self-classified this software as Export Commodity Control Number (E
CCN) EAR99 which includes mass market information security software using or per
forming cryptographic functions with asymmetric algorithms. No license is requir
ed for export of this software to non-embargoed countries.

The Intel Math Kernel Library contained in Anaconda Distribution is classified b
y Intel as ECCN 5D992.c with no license required for export to non-embargoed cou
ntries.

The following packages listed on https://www.anaconda.com/cryptography are inclu
ded in the repository accessible through Anaconda Distribution that relate to cr
yptography.

Last updated February 25, 2022

Do you accept the license terms? [yes|no]
[no] >>>
Please answer 'yes' or 'no':
>>> yes
```

- Then, press Enter to install anaconda in default location.

```
sandeep@sandeep-Inspiron-5559: ~/Downloads

The Intel Math Kernel Library contained in Anaconda Distribution is classified by Intel as ECCN 5D992.c with no license required for export to non-embargoed countries.

The following packages listed on https://www.anaconda.com/cryptography are included in the repository accessible through Anaconda Distribution that relate to cryptography.

Last updated February 25, 2022

Do you accept the license terms? [yes|no]
[no] >>>
Please answer 'yes' or 'no':
>>> yes

Anaconda3 will now be installed into this location:
/home/sandeep/anaconda3

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

[/home/sandeep/anaconda3] >>> 
```

- Type “yes” when you will be prompt to initialize conda init.

```
sandeep@sandeep-Inspiron-5559: ~/Downloads

zope.interface      pkgs/main/linux-64::zope.interface-5.4.0-py39h7f8727e_0
zstd                pkgs/main/linux-64::zstd-1.4.9-haebb681_0

Preparing transaction: done
Executing transaction: \

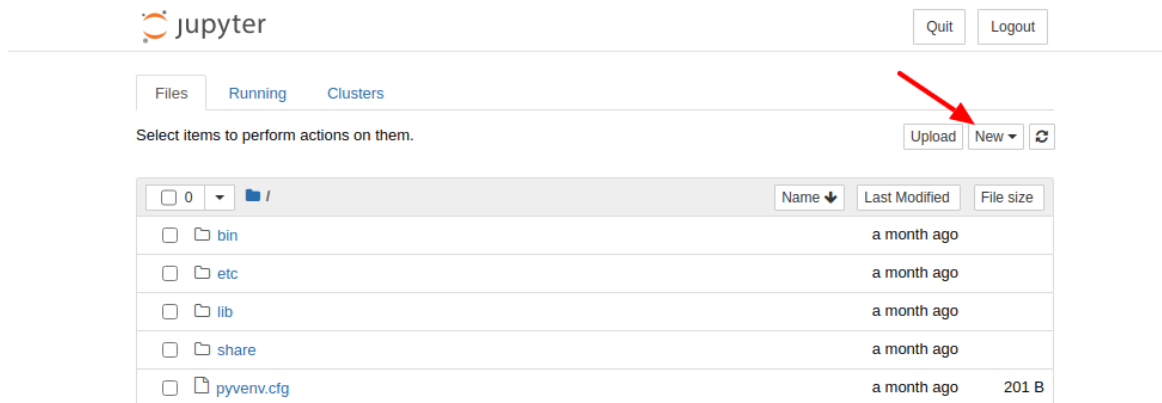
  Installed package of scikit-learn can be accelerated using scikit-learn-intelex.
  More details are available here: https://intel.github.io/scikit-learn-intelex
  For example:

  $ conda install scikit-learn-intelex
  $ python -m sklearnex my_application.py

done
installation finished.
Do you wish the installer to initialize Anaconda3
by running conda init? [yes|no]
[no] >>> 
```

- Run the following command in command prompt to launch Jupyter Notebook  
- `jupyter notebook`

This is the home screen of jupyter which will run in your browser.



## Installing Jupyter Notebook using Pip:

- Make sure to have python version 3.7 or above.
- Open terminal and enter - `python -m pip install jupyter`
- Run the following command in command prompt to launch Jupyter Notebook  
- `jupyter notebook`

This is the home screen of jupyter which will run in your browser.

## ▼ Jupyter Notebook on macOS:

Install Anaconda Distribution using either the graphical installer (“wizard”) or the command line (“manual”) instructions below. If you are unsure, choose the graphical install. Jupyter, included in Anaconda.

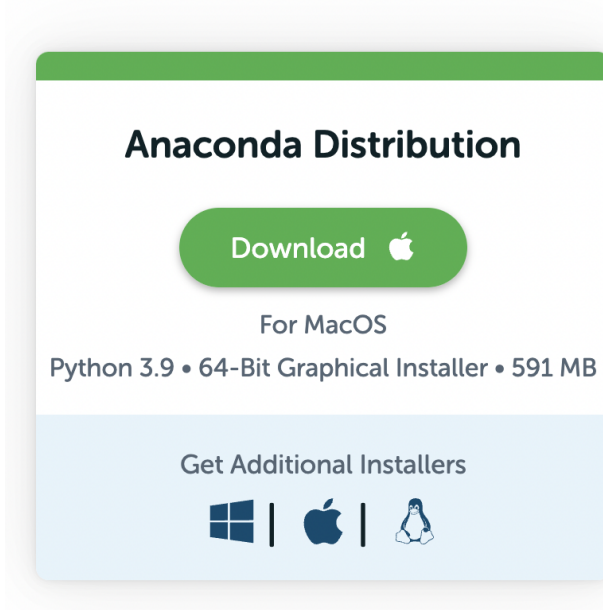
### macOS graphical install

1. Download the graphical [macOS installer](#) for your version of Python.

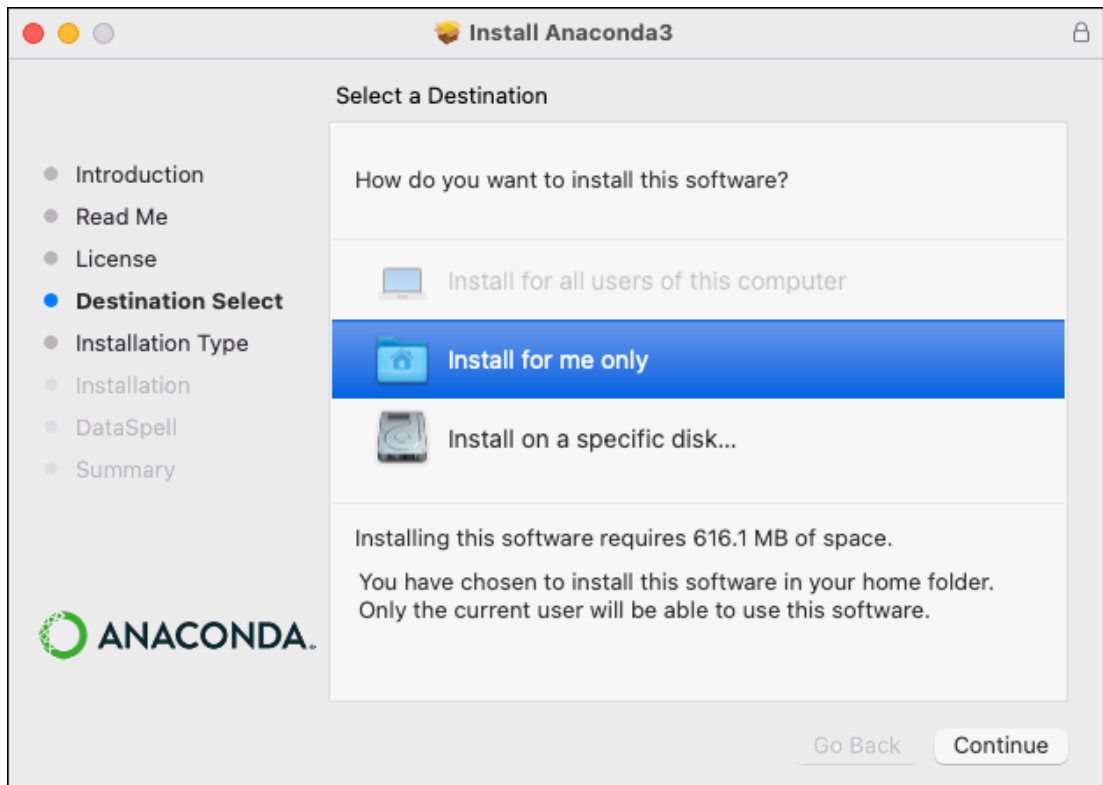
Individual Edition is now

# ANACONDA DISTRIBUTION

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



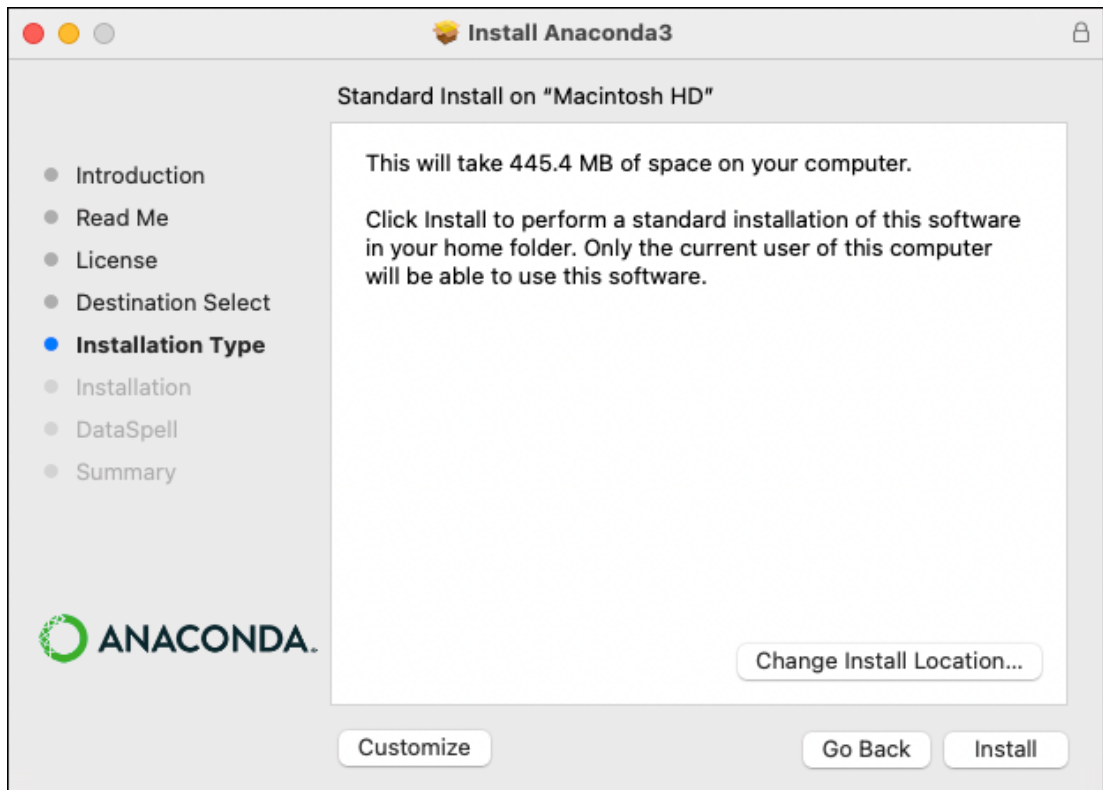
2. Double-click the downloaded file and click **Continue** to start the installation.
3. Answer the prompts on the Introduction, Read Me, and License screens.
4. Click **Change Install Location** to install Anaconda Distribution for all users or on a specific disk. This is not recommended. **Install for me only** is the default (and recommended) selection. Click **Continue** to return to Installation Type.



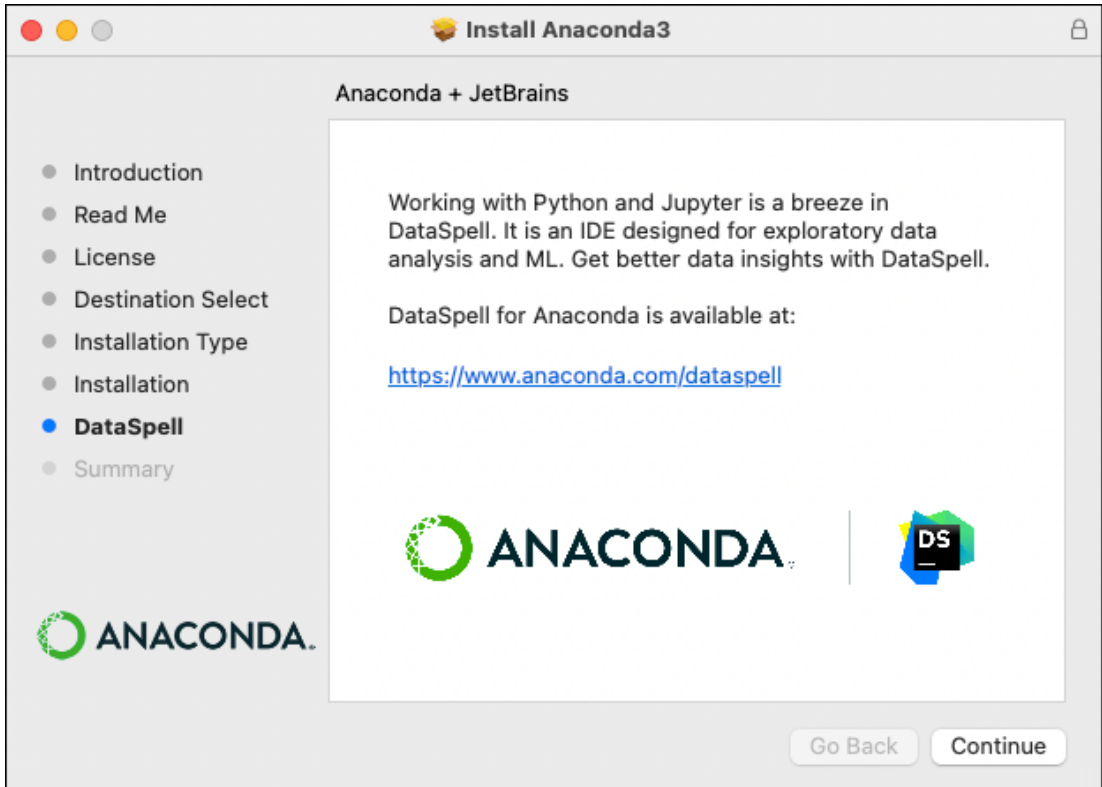
**Note:** If you get the error message “You cannot install Anaconda in this location,” reselect **Install for me only**.

5. Click **Install** to install Anaconda in the opt folder in your user directory (recommended).

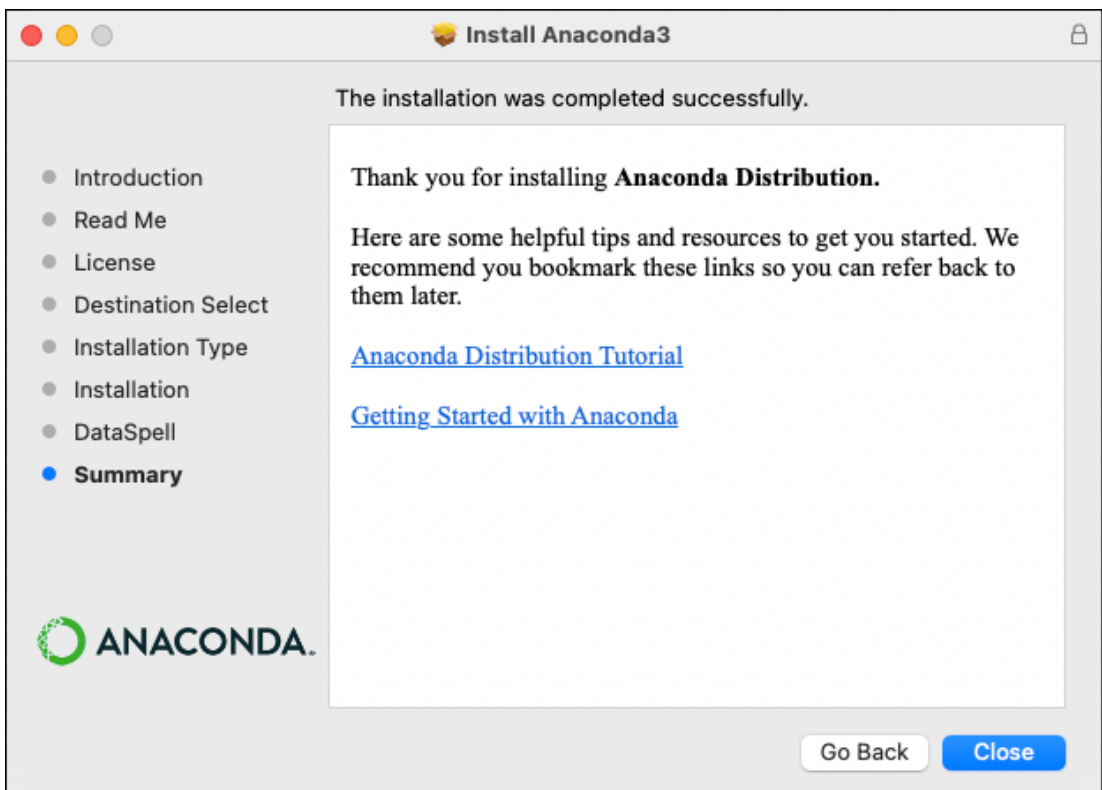




6. Once the install is complete, click **Continue**.
7. Optional: To install DataSpell for Anaconda, click <https://www.anaconda.com/dataspell>. Or to continue without Dataspell, click **Continue**.



8. A successful installation displays the following screen:



9. Verify your installation: Open Anaconda-Navigator and Launch Jupyter Notebook.

## Using the command-line install

Use this method if you prefer to use a terminal window.

1. In your browser, download the command-line version of the macOS installer for your system.
2. (Recommended) Verify the installer's data integrity with SHA-256. For more information on hash verification, see cryptographic hash validation.
  - Open a terminal and run the following:

```
shasum -a 256 /PATH/FILENAME  
# Replace /PATH/FILENAME with your installation's path and filename.
```

3. Install for Python 3.7:

- For Python 3.7, enter the following:

```
# Include the bash command regardless of whether or not you are using the  
Bash shell  
bash ~/Downloads/Anaconda3-2020.05-MacOSX-x86_64.sh  
# Replace ~/Downloads with your actual path# Replace the .sh file name with  
the name of the file you downloaded
```

4. Press Enter to review the license agreement. Then press and hold Enter to scroll.
5. Enter “yes” to agree to the license agreement.
6. Use Enter to accept the default install location, use CTRL+C to cancel the installation, or enter another file path to specify an alternate installation directory. If you accept the default install location, the installer displays `PREFIX=/home/<USER>/anaconda<2/3>` and continues the installation. It may take a few minutes to complete.

### Note

Unlike the graphical install, installing the shell file will place it in `~/anaconda<2 or 3>` by default, not `~/opt`. This is due to limitations with installing `.pkg` files on macOS Catalina.

7. Installation may take a few minutes to complete.

### Note

Anaconda recommends you accept the default install location. Do not choose the path as `/usr` for the Anaconda/Miniconda installation.

8. The installer prompts you to choose whether to initialize Anaconda Distribution by running `conda init`. recommend entering “yes”.

If you enter “no”, then conda will not modify your shell scripts at all. In order to initialize conda after the installation process is done, first run `source PATH-TO-CONDA/bin/activate` and then run `conda init`.

### Note

If you are on macOS Catalina, the new default shell is zsh. To initialize after the installation proces is done with a zsh shell,

run `source <path to conda>/bin/activate` followed by `conda init zsh`.

9. The installer finishes and displays, “Thank you for installing Anaconda<2/3>!”
10. Optional: The installer describes the partnership between Anaconda and JetBrains and provides a link to install Dataspell for Anaconda at <https://www.anaconda.com/dataspell>.
11. Close and re-open your terminal window for the installation to take effect, or enter the command `source ~/.bashrc` to refresh the terminal.
12. You can also control whether or not your shell has the base environment activated each time it opens.

```
# The base environment is activated by default  
conda config --set auto_activate_base True
```

```
# The base environment is not activated by default  
conda config --set auto_activate_base False
```

```
# The above commands only work if conda init has been run first# conda init is  
available in conda versions 4.6.12 and later
```

13. Verify your installation: Open Anaconda-Navigator and Launch Jupyter Notebook.

**Note:** If you install multiple versions of Anaconda, the system defaults to the most current version, as long as you haven’t altered the default install path.

## ▼ Steps for Qiskit Installation:

- First open Terminal if you are using (Ubuntu/macOS) or Command Prompt if you are using Windows.

- Then enter this command for Qiskit installation: `pip install qiskit`
- You will get final message like this :

```
om cffi>=1.12->cryptography>=1.3->requests-ntlm>=1.1.0->qiskit-ibmq-provider==0.19.2->qiskit) (2.20)
Installing collected packages: qiskit
Successfully installed qiskit-0.37.1
```

- If you intend to use visualization functionality or Jupyter notebooks it is recommended to install qiskit with the visualization extra requirements

```
pip install qiskit [ visualization ]
```

**Note:** It is worth pointing out that if you're a zsh user (which is the default shell on newer versions of macOS), you'll need to put `qiskit[visualization]` in quotes:

```
pip install 'qiskit[visualization]'
```

- Final message in this step will be:

```
(from bleach->nbconvert->notebook>=4.4.1->widgetsnbextension~=3.5.0->ipywidgets>=7.3.0->qiskit)
Installing collected packages: qiskit
Successfully installed qiskit-0.37.1
```

- To verify if Qiskit installed successfully.
  - Open Anaconda-Navigator and Launch Jupyter Notebook.
  - Create python notebook in desired location in your system.
  - Run `import qiskit` in Notebook, you **should not** get any error.
  - To Run sample code copy paste sample code given below in Notebook and Run. You should get output given below.

## Sample Code

```
import numpy as np
from qiskit import QuantumCircuit, transpile
from qiskit.providers.aer import QasmSimulator
from qiskit.visualization import plot_histogram

# Use Aer's qasm_simulator
simulator = QasmSimulator()

# Create a Quantum Circuit acting on the q register
circuit = QuantumCircuit(2, 2)
```

```

# Add a H gate on qubit 0
circuit.h(0)

# Add a CX (CNOT) gate on control qubit 0 and target qubit 1
circuit.cx(0, 1)

# Map the quantum measurement to the classical bits
circuit.measure([0,1], [0,1])

# compile the circuit down to low-level QASM instructions
# supported by the backend (not needed for simple circuits)
compiled_circuit = transpile(circuit, simulator)

# Execute the circuit on the qasm simulator
job = simulator.run(compiled_circuit, shots=1000)

# Grab results from the job
result = job.result()

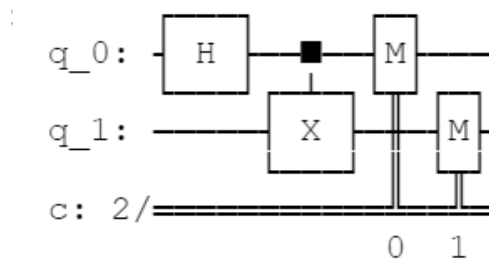
# Returns counts
counts = result.get_counts(compiled_circuit)
print("\nTotal count for 00 and 11 are:",counts)

# Draw the circuit
circuit.draw()

```

## Output

```
Total count for 00 and 11 are: {'00': 488, '11': 512}
```



**Note: Run this code on jupyter notebook for better visualization.**

## Contacts

Feel free to mail or WhatsApp us for any query.

- Neeraj Chauhan



- neerajch21@iitk.ac.in
- 9165892927
- Varun Vankudre
  - varunsv21@iitk.ac.in
  - 9987184382
- Dinkar Tewari
  - dinkart21@iitk.ac.in
  - 8918362808