National College of Ireland

Configuration Manual

MSc Internship
Cyber Security

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MSc Project Submission Sheet

School of Computing

Student Name:	Nilisha B. Wandile	
Student ID:	X18134416	
Programme:	MSc in Cyber Security	**Year:** 2019-2020
Module:	MSc Internship	
Lecturer:	Ben Fletcher	
Submission Due Date:	12/12/2019	
Project Title:	Advanced techniques for storing passwords using image steganography and multi-level encryption with password splitting method	
Word Count:	1920	**Page Count:** 25

I hereby certify that the information contained in this (my submission) is information pertaining to research I conducted for this project. All information other than my own contribution will be fully referenced and listed in the relevant bibliography section at the rear of the project.
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I agree to an electronic copy of my thesis being made publicly available on NORMA the National College of Ireland's Institutional Repository for consultation.

Signature: ……

Date: 11/12/2019

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Background

In this project we have used 3 technologies, Python version 3.7, Spyder 3.7.4 which is a Scientific Python Development Environment and Anaconda 3.7 to display the results in the console. Anaconda is an opensource distribution where codes in Python, R, machine learning programs can be performed [1]. Sections below highlight the configuration steps for each tool on operating systems like Windows 10, Mac and Linux.

Section 1

1.1 Python v. 3.7

1.1.1 Windows 10

Before downloading the python version 3.7, first, it is important to check if python is already installed on the system. This can be done by opening the command prompt and type python. If it is already there, it will take you to python and low something like this:

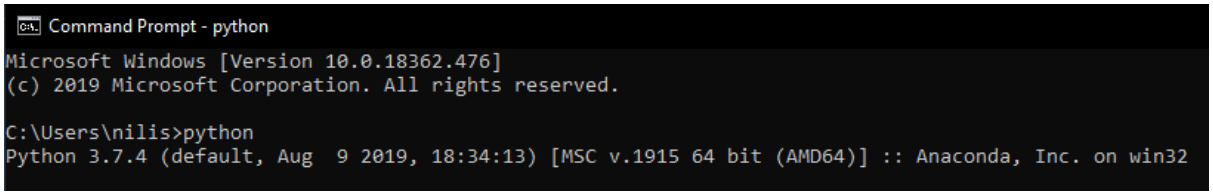
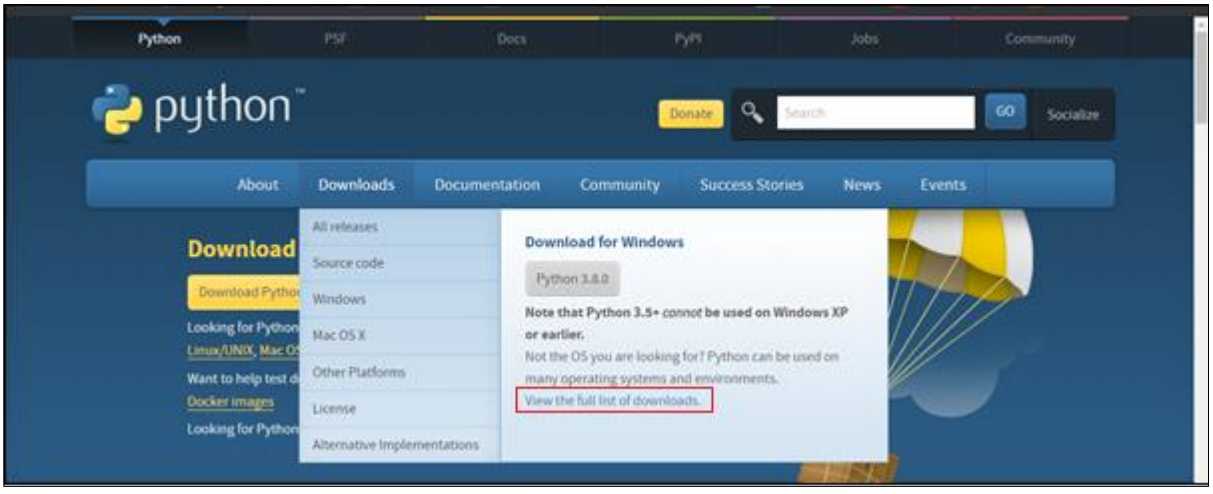
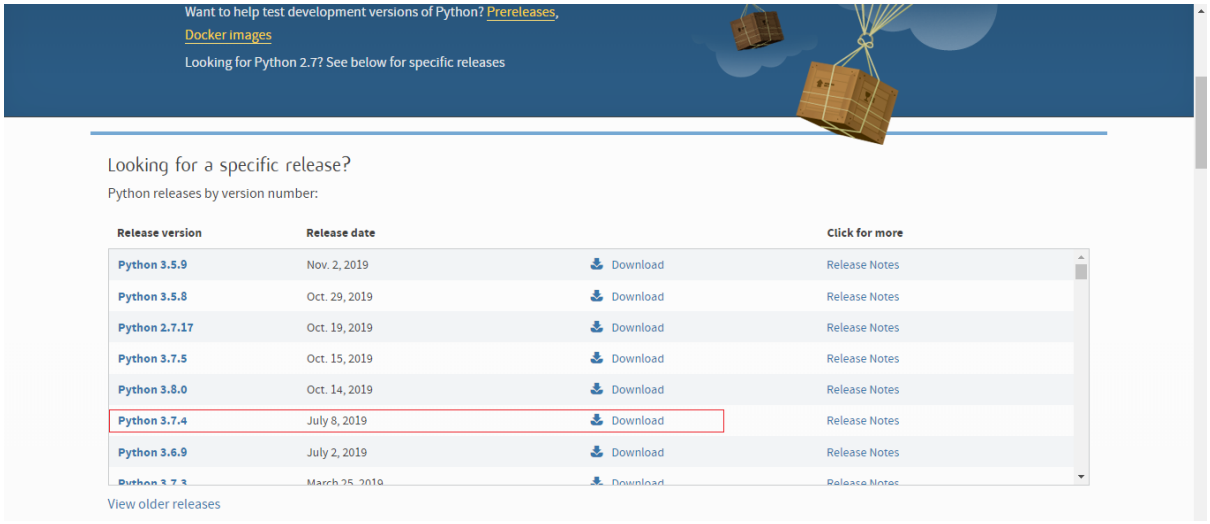


Figure 1: Checking python on cmd

If python is not installed in the system already, follow the below steps-

Step 1: Go to python's official website or visit python.org/downloads/ and click on downloads. Click on View the full list of downloads.

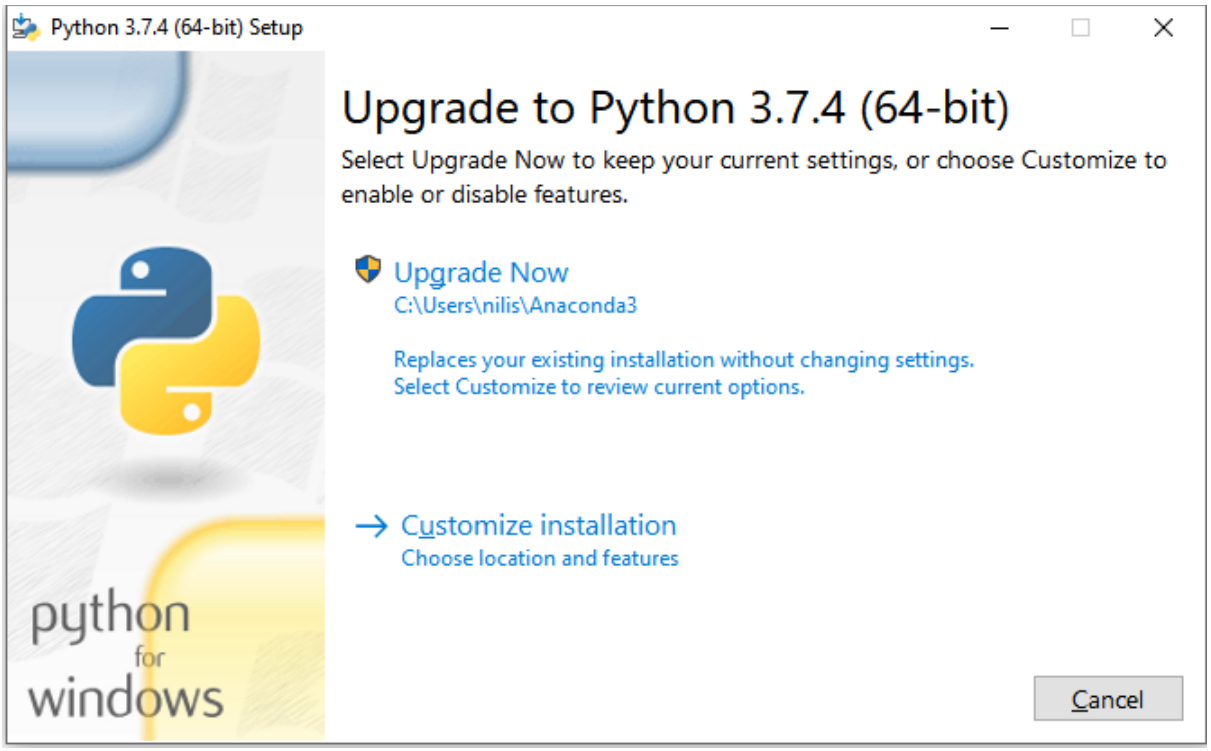




Step 2: Click on Python 3.7.4 download as we have used this version for our proposed solution.

Step 3: Once, the download is finished, locate the exe file and execute it.

Step 4: If any version of python is already installed on the system it will display below screen-



Click on **Upgrade Now**

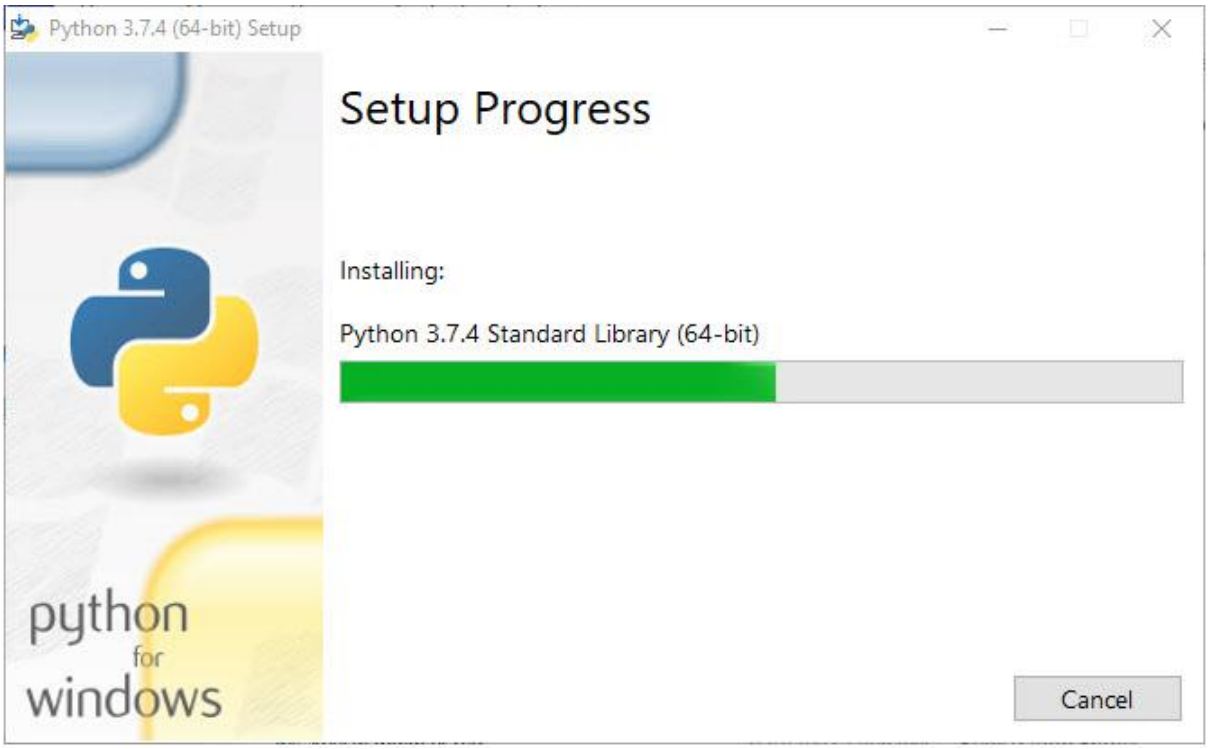
Else, a box with the below steps will be shown.
Click on **Install Now** and make sure to check both the checkboxes **Install launcher for all users (recommended)** and the **Add Python 3.7 to PATH**.

Step 5: Click on Install Now

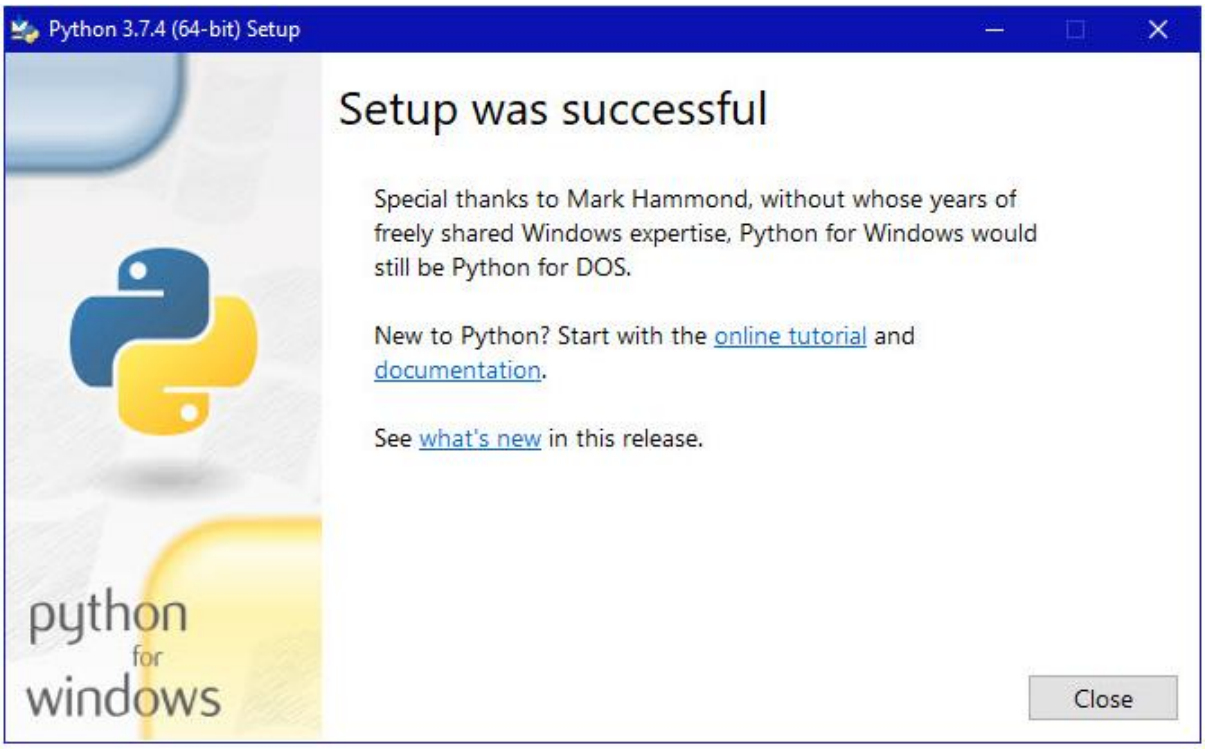
After clicking on **Install Now**, a pop-up will be displayed asking, "**Do you want to allow this app to make changes to your device**". Click on the **Yes** button.

Step 6:

Python 3.7.4 (64-bit) Setup window will be displayed showing with setup progress.



During this process, it will install various libraries and packages which will be displayed above the progress bar. Once the installation is complete below pop-up will appear on the screen showing a message **Setup was successful**.



Step 7: Click the **Close** button.

If the environment variable needs to be configured permanently it can be done in Windows at the user level and system level. It can be configured temporarily in the command prompt [2].

To verify the installation is successful or not, go to command prompt and type python. A window like Figure 1 will be displayed confirming the successful installation.

To set the environment variable temporarily, use set command on command prompt.

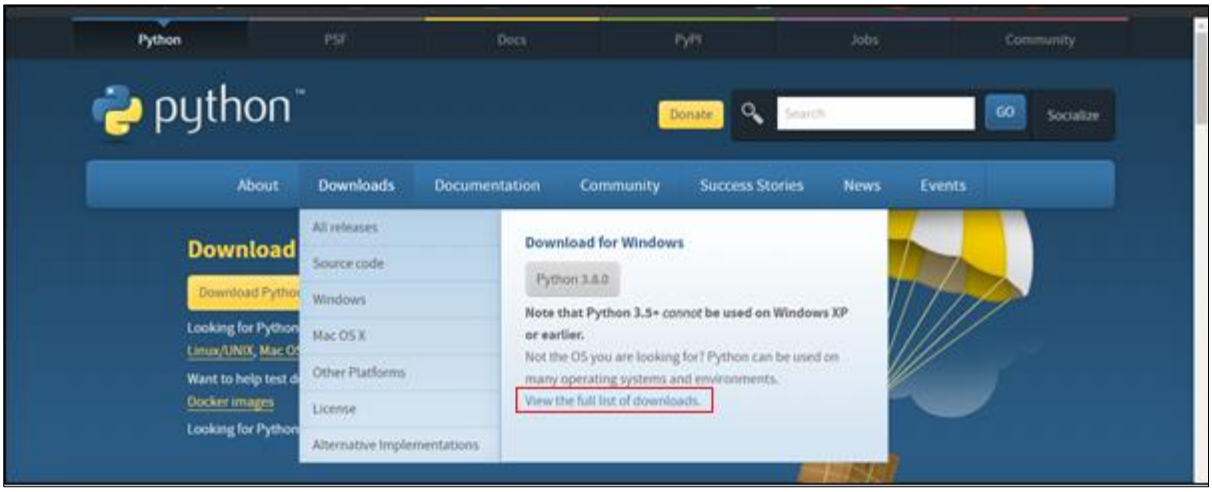
```
C:\>set PATH=C:\Program Files\Python 3.7;%PATH%
C:\>set PYTHONPATH=%PYTHONPATH%;C:\My_python_lib
C:\>python
```

Figure 2: Set command on command prompt [3]

1.1.2 macOS

The macOS comes with Python 2.7 pre-installed by Apple [4]. But since we need python 3.7.4 we will have to follow the same steps as windows.

Step 1: Go to python's official website or visit python.org/downloads/ and click on **Downloads**. Click on **View the full list of downloads**.



After clicking on that, you will be taken to the below screen.

Step 2: Click on **Download macOS 64-bit installer.**

Follow steps 3 to 7, same as the Windows.

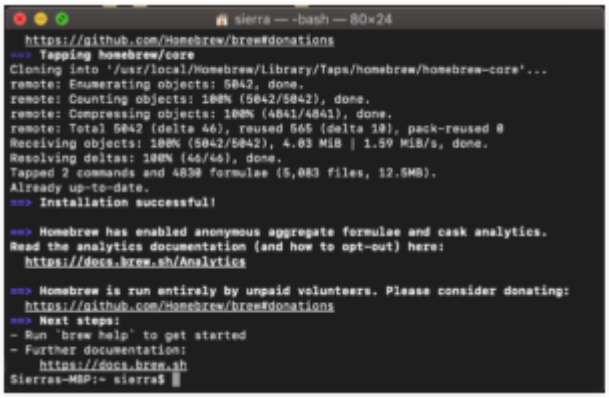
Else, the user just needs to update the existing version which requires **Homebrew Package Manager**

To install homebrew on the system, follow below steps,

Step 1: Open the terminal on the macOS from the Applications section and then Utilities. Now in the terminal, you can enter the following command-

```
/usr/bin/ruby -e "$(curl -fsSL
https://raw.githubusercontent.com/Homebrew/install/master/install)"
```

Step 2: You will be asked to enter the system password to install Homebrew.

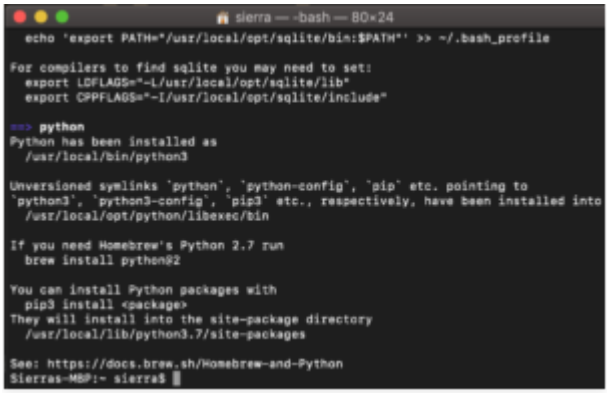


Installation Successful! A message will be displayed and now you are ready to install Python 3 on your system.

Step 3: To install Python 3, open the terminal follow Step 1 and enter the below command.

```
brew install python3
```

Once the command has been processed, Python's version 3 would be installed on your macOS.

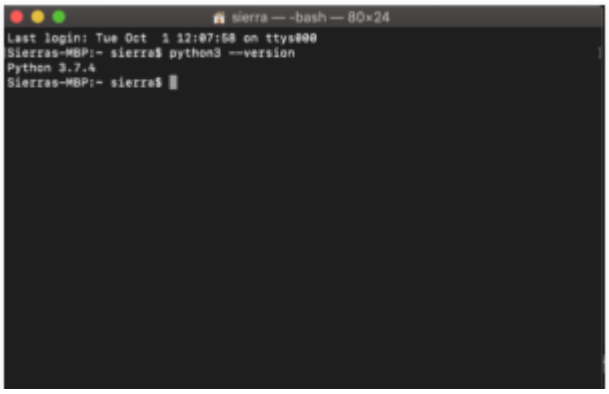


Step 4: To confirm the successful installation, enter below commands-

```
python
```

```
pip3
```

Finally, the below window will be displayed [5].



1.1.3 Linux

All Linux systems including the OS mentioned below, come with Python pre-installed on it. To check that, enter below command-

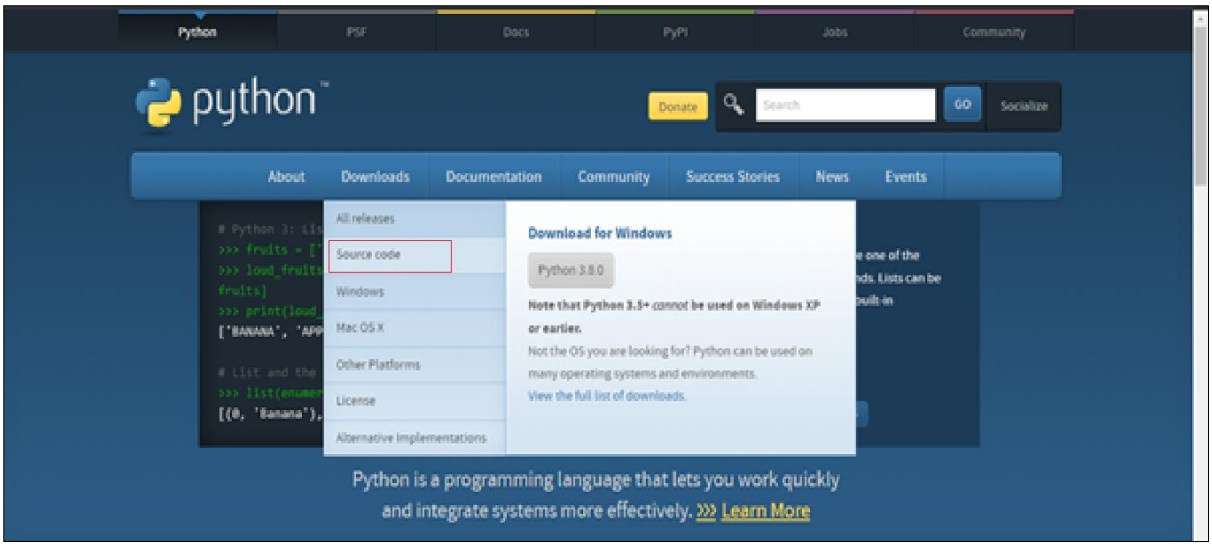
```
$ python --version
```

Enter below command to check the latest version of python 3.x.x-

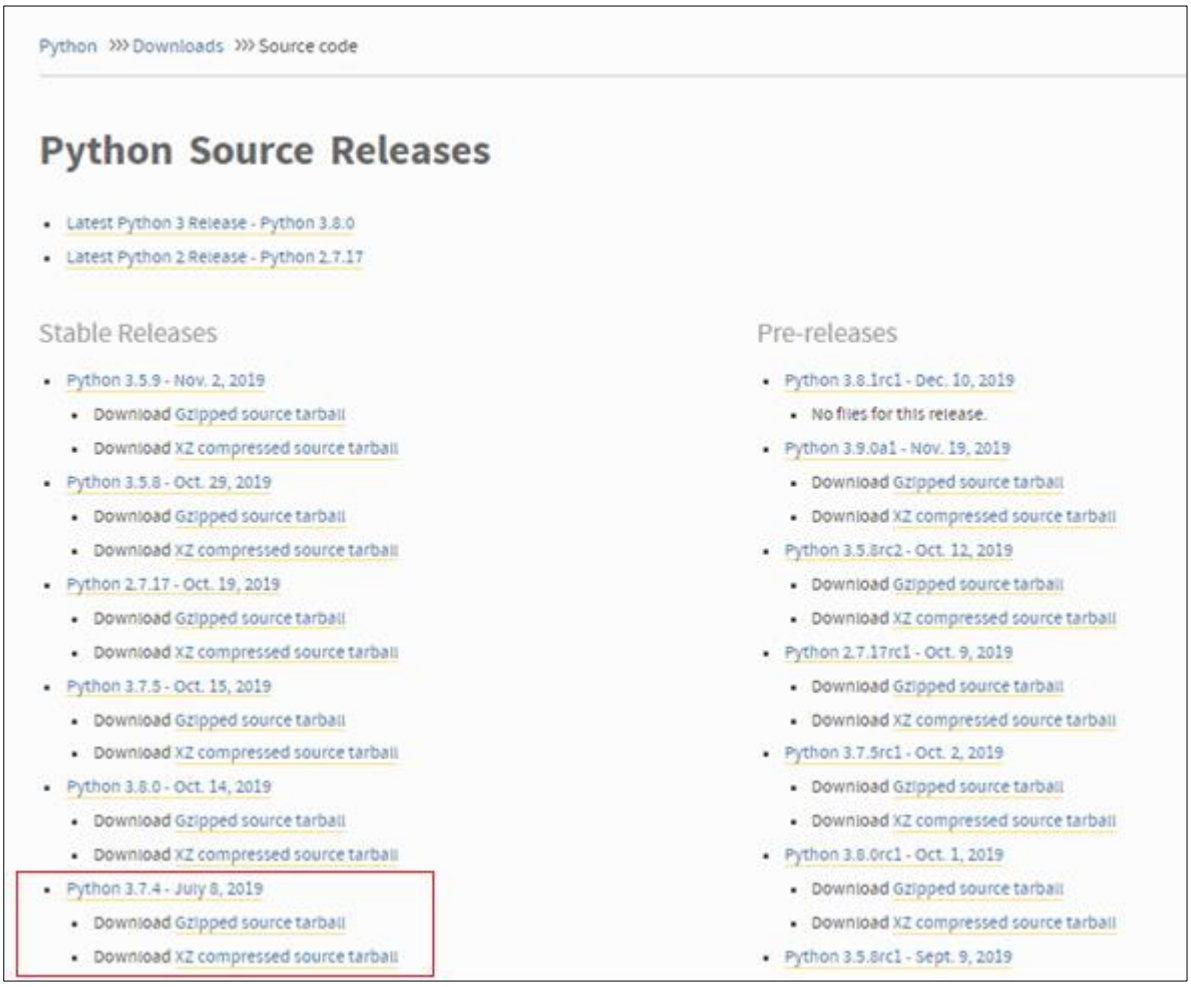
```
$ python3 --version
```

To download it from the official python website, follow below steps-

Step 1: Go to python's official website or visit python.org/downloads/ and click on **Source Code**.



The below screen will appear, click on Python 3.7.4 and download it.



The best way to do it in a single step is through commands.

Enter below command-

```
$ wget https://www.python.org/ftp/python/3.7.4/Python-3.7.4.tgz
```

For a successful installation of python 3.7.4, we need some prerequisites and other sources to be ready. Enter below commands-

```
$ sudo apt-get update

$ sudo apt-get upgrade

$ sudo apt-get install -y make build-essential libssl-dev zlib1g-dev
libbz2-dev libreadline-dev libsqlite3-dev wget curl llvm libncurses5-
dev  libncursesw5-dev xz-utils tk-dev
```

Now the system is ready to unpack the downloaded files.

Go to the downloads directory by entering **cd downloads** in the terminal and enter below command-

```
$ tar xvf Python-3.6.5.tgz

$ cd Python-3.6.5

$ ./configure --enable-optimizations --with-ensurepip=install

$ make -j 8

$ sudo make altinstall
```

Now the installation would be completed on your system.

Enter the below command and confirm the installation [5].

```
python --version
```

Section 2

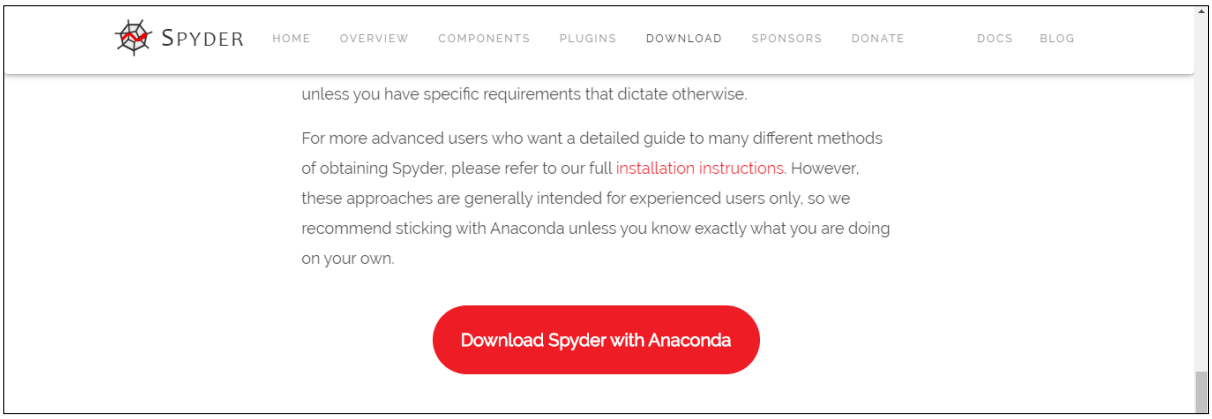
2.1 Spyder 3.7.4 and Anaconda 3.7

2.1.1 Windows

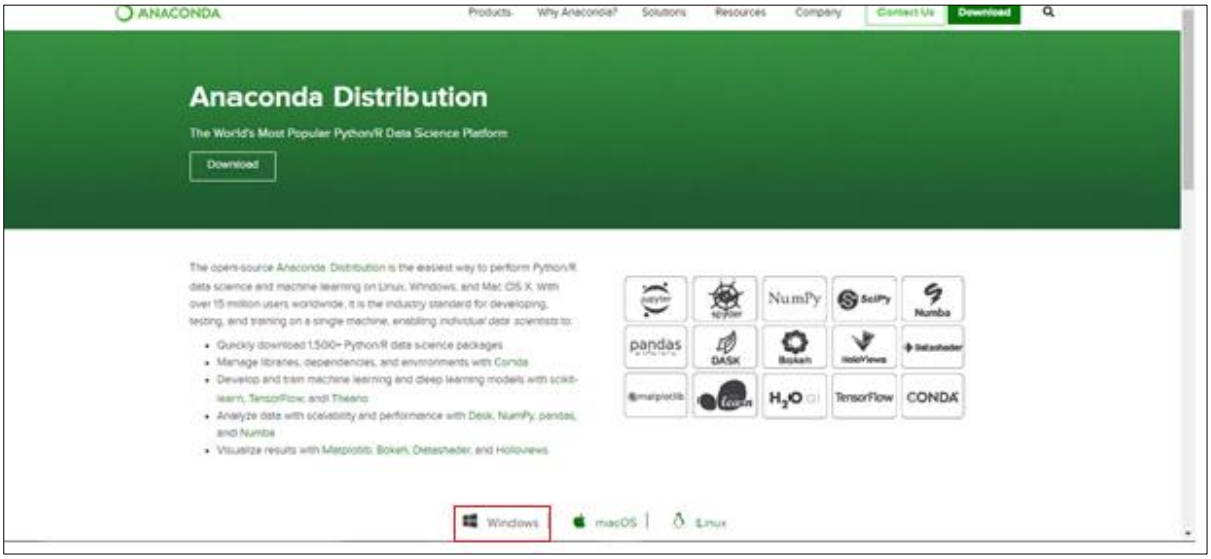
Spyder comes by default with the Anaconda Python distribution and comes with all the resources you may need to get started [6].

To download and install both the tools, follow the below steps.

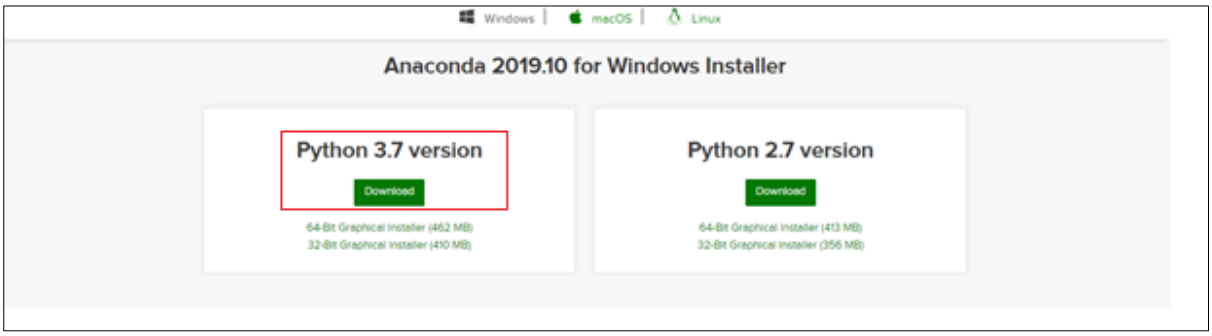
Step 1: Go to the official site of Spyder www.spyder-ide.org/ and click on **Download** as shown in the below figure.



Step 2: Now click on **Download Spyder with Anaconda** and it will redirect you to below page-

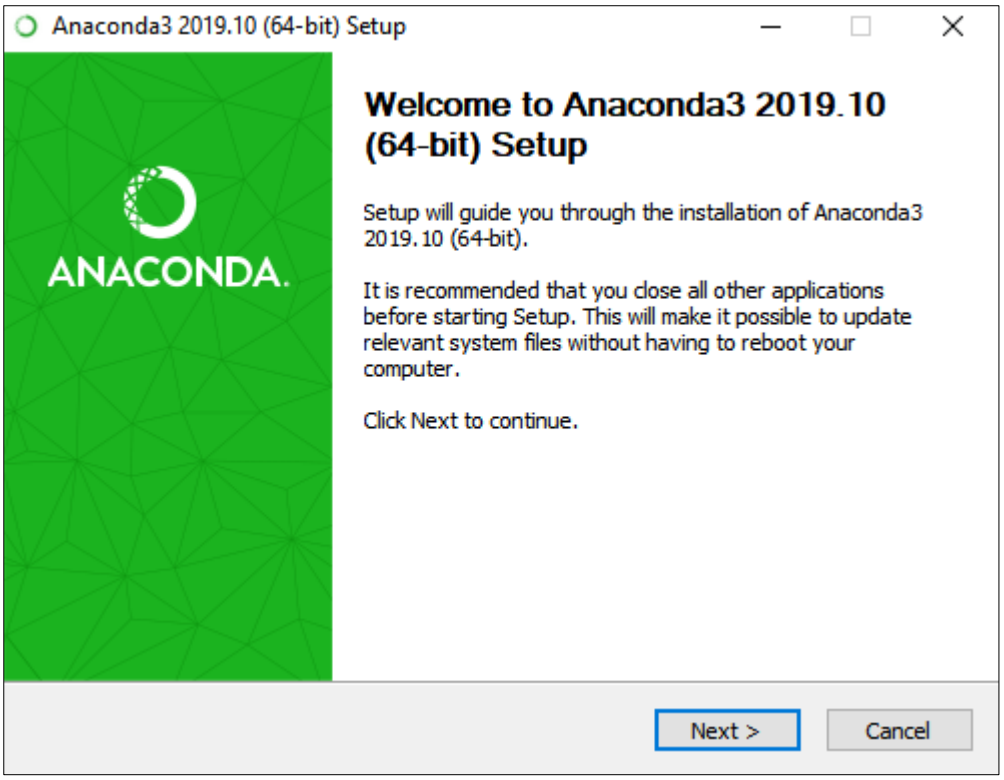


Click on Windows and below, you will see another window

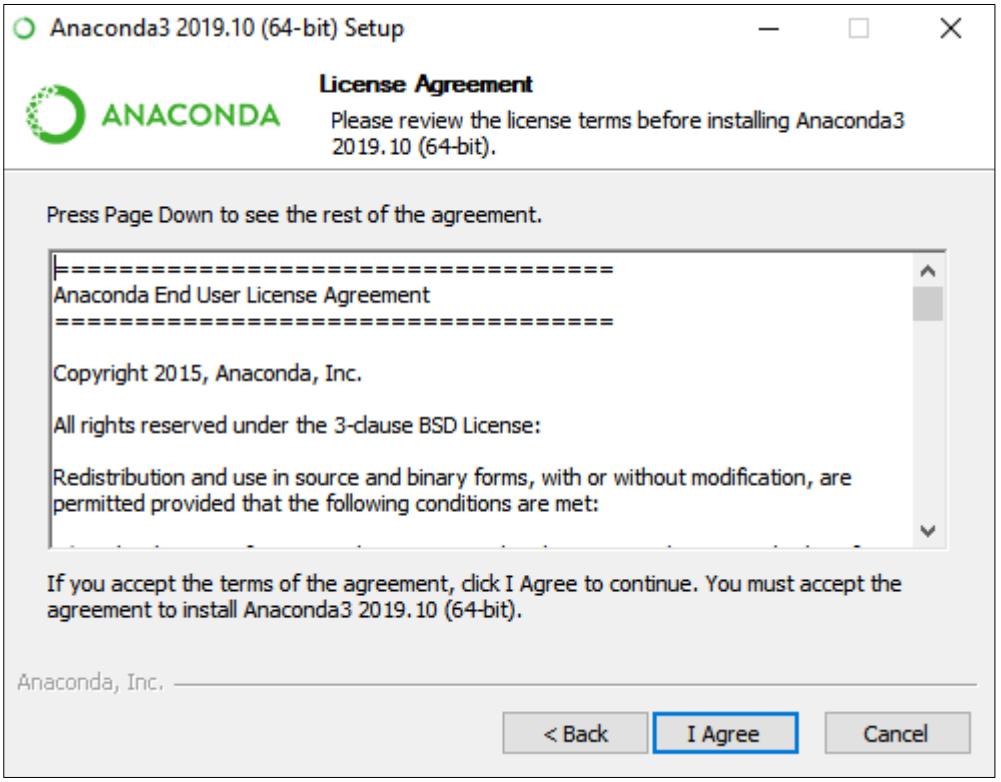


Click on **Download** and **Python 3.7 version** for windows will be downloaded

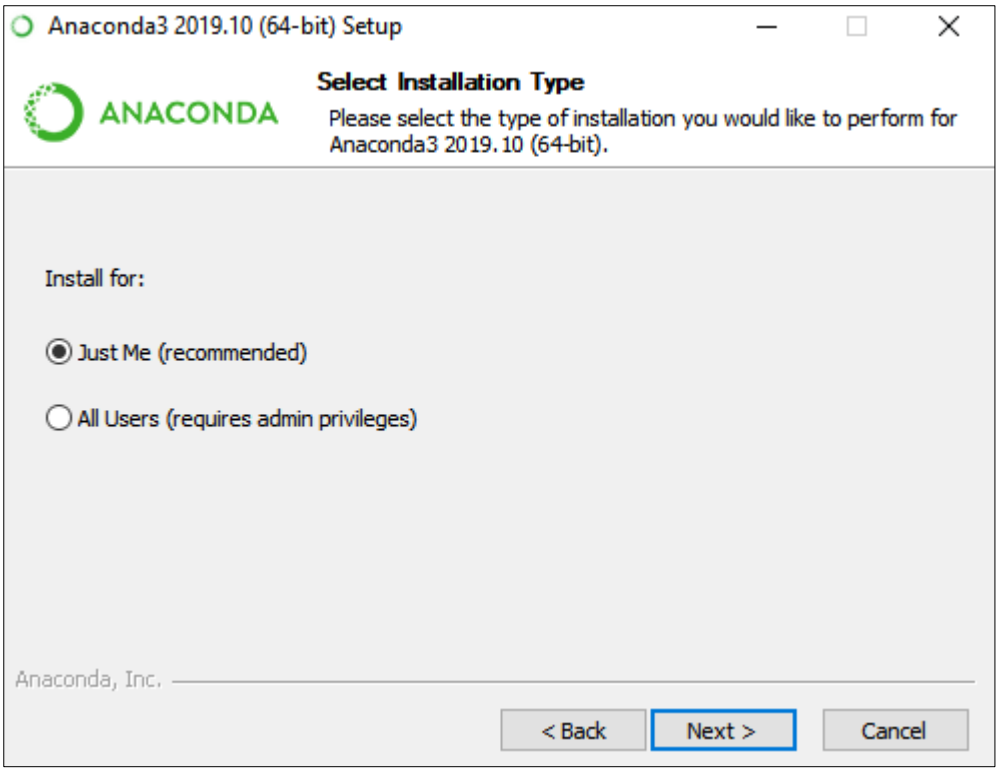
Step 3: Locate the exe file and run.



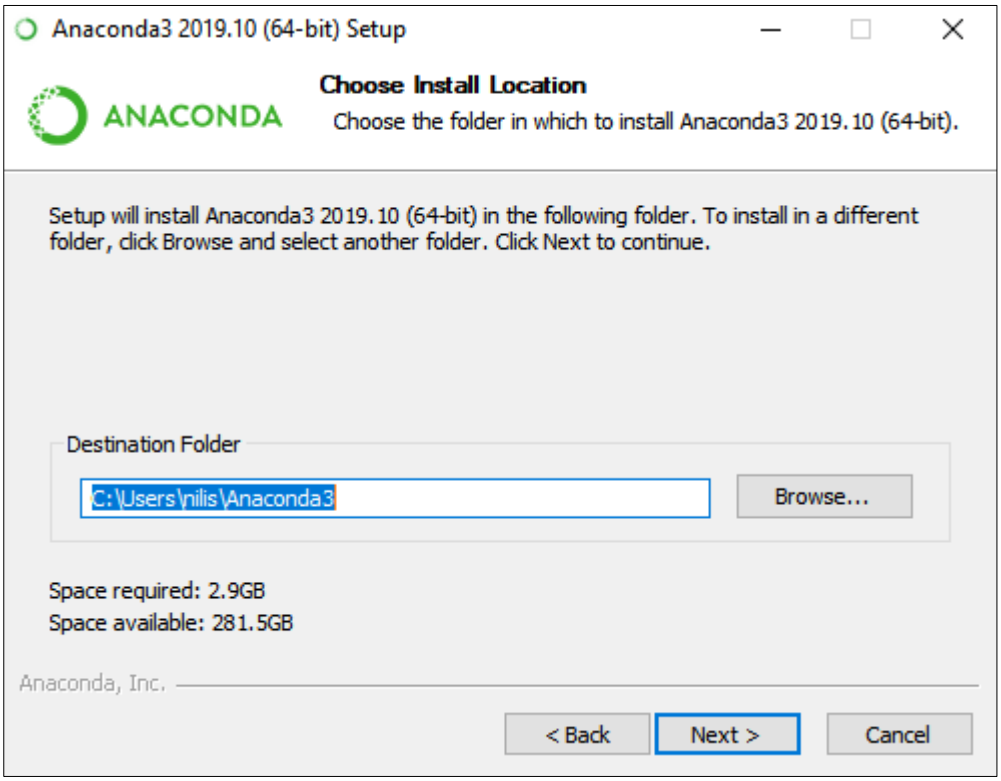
Click on **Next.**



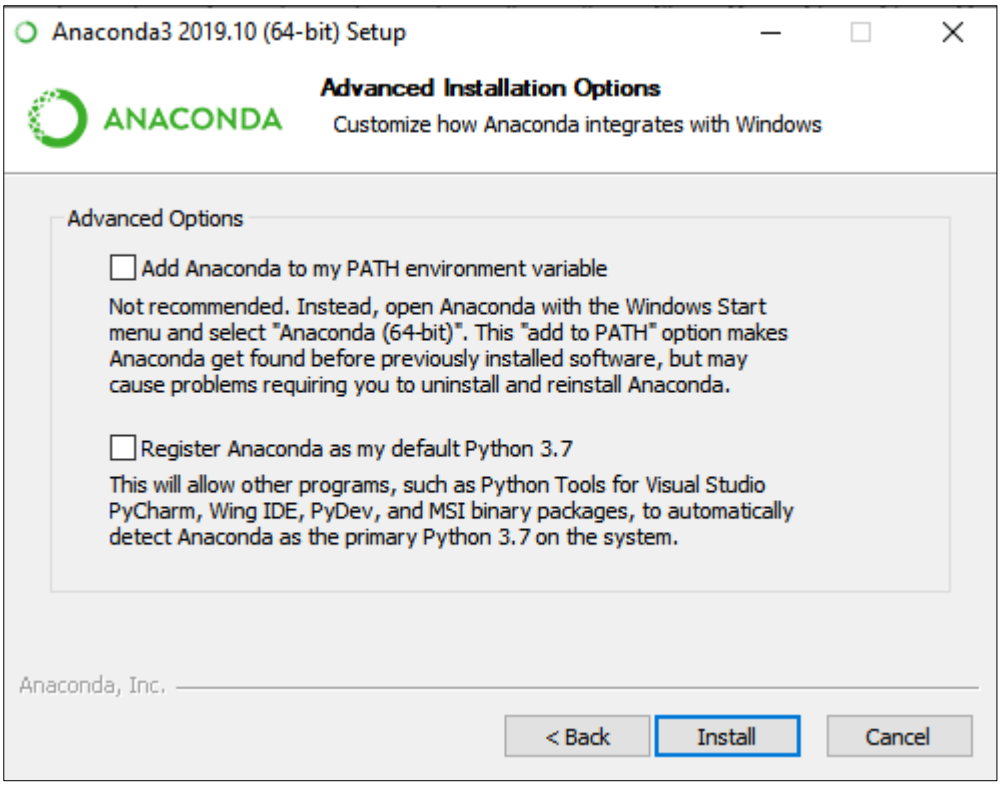
Click **I Agree.**



Select the radio button **Just Me (recommended).**

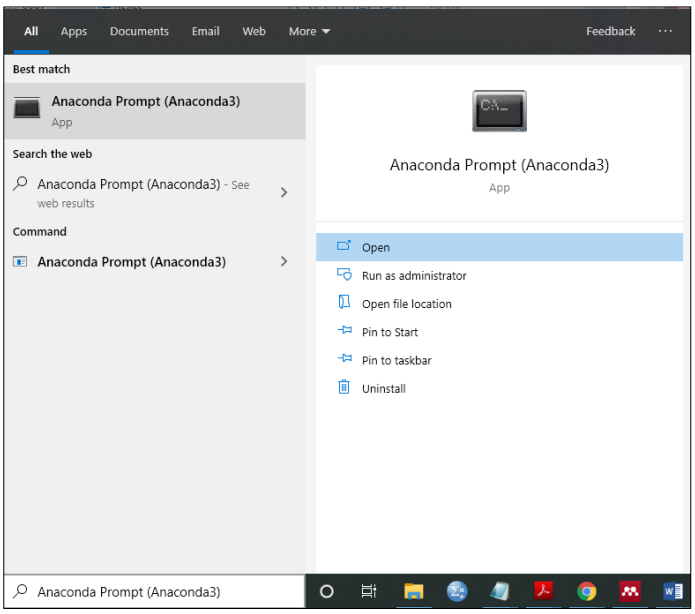


Click on the **Browse** button and select a path where you want to store Anaconda3on your system and click **Next.**



Here, check the **Register Anaconda as my default Python 3.7** option and click on the **Install** button.

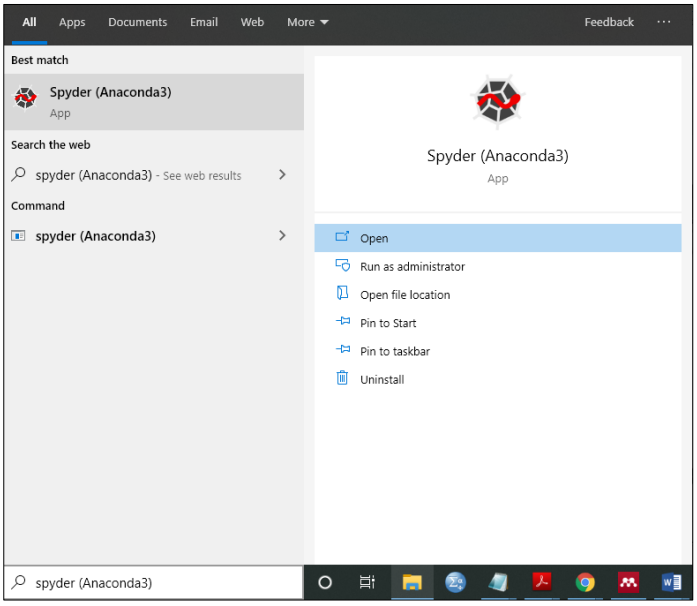
Step 4: Now open Anaconda by typing **in Anaconda Prompt (Anaconda3)** in the search bar.



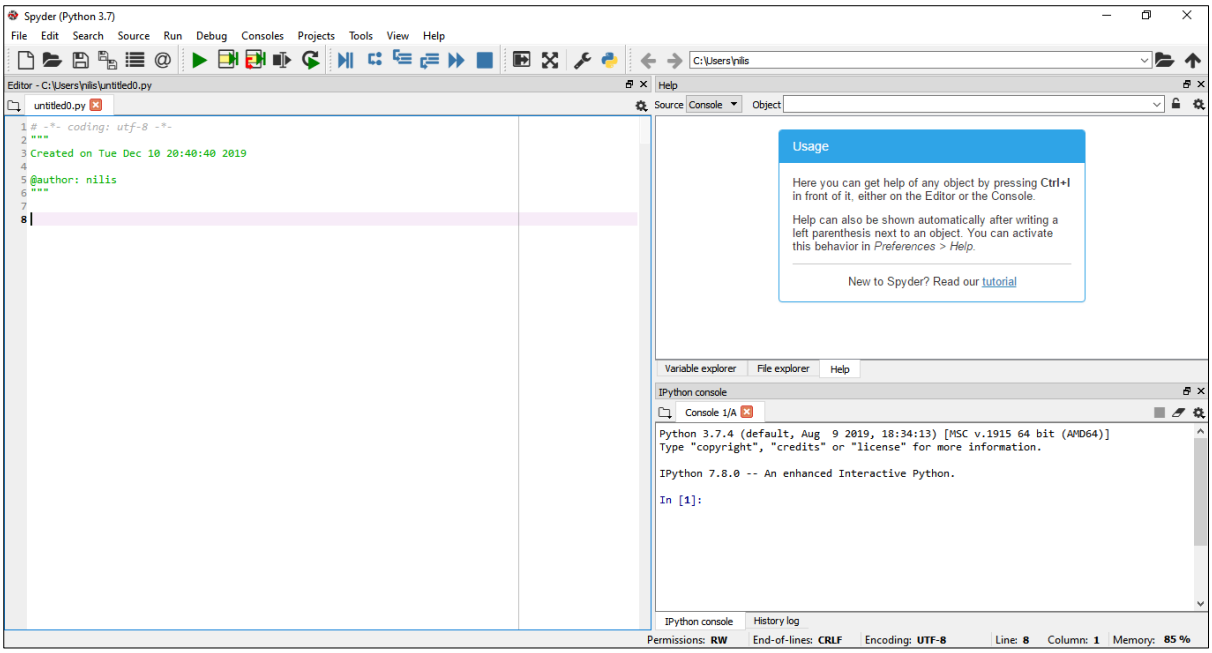
The Anaconda3 prompt will display something like this

You can locate your window by typing in cd command and the name of the directory where you have stored Anaconda3

Step 5: Simultaneously, open Spyder by typing in Spyder (Anaconda 3) in the search bar to start writing your program.



Once Spyder opens, below window will be displayed-



Start wring your program here.

For our program, we required some packages to be installed on Anaconda to import some libraries and execute our program.

Step 6: Now go back to Anaconda and install required packages by entering below commands-

```
pip install pycryptodome
```

```
pip install simple-crypt
```

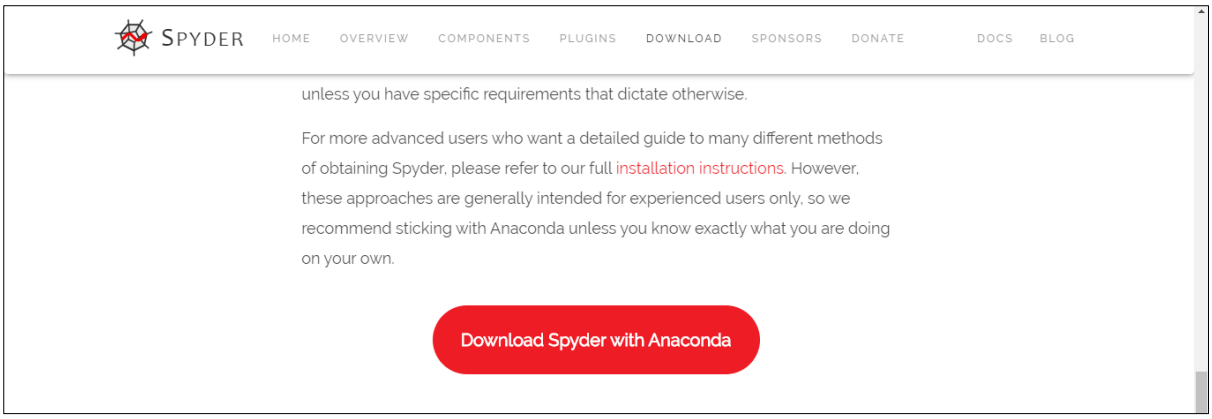
This will install the packages required for encryption and decryption. The rest of the packages required to run the program are pre-installed.

Step 7: Now the Anaconda 3 Distribution is ready to run the program on Windows.
Get to the directory where the program is stored by typing in the path and below command-

```
python stegnocode3.py
```

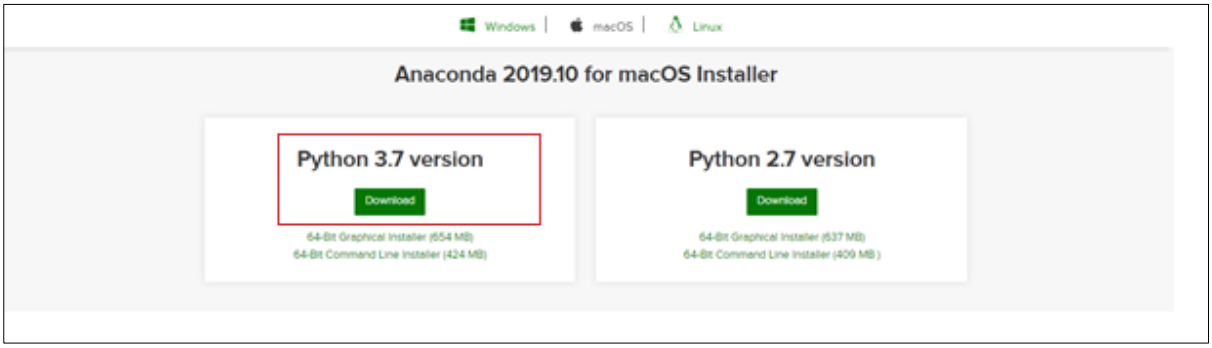
2.1.2 macOS

Step 1: Go to the official site of Spyder www.spyder-ide.org/ and click on **Download** as shown in the below figure.



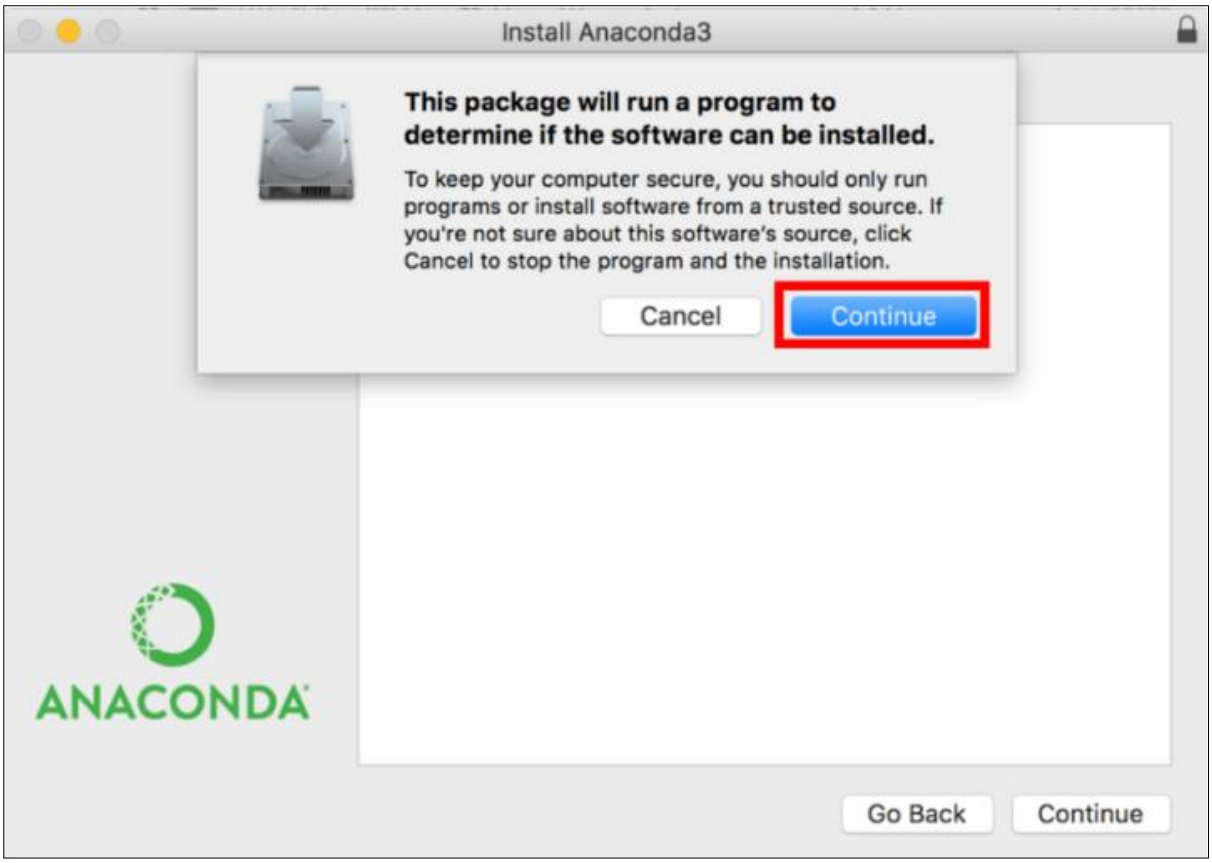
Step 2: Now click on **Download Spyder with Anaconda** and it will redirect you to below page-

Click on macOS and below, you will see another window

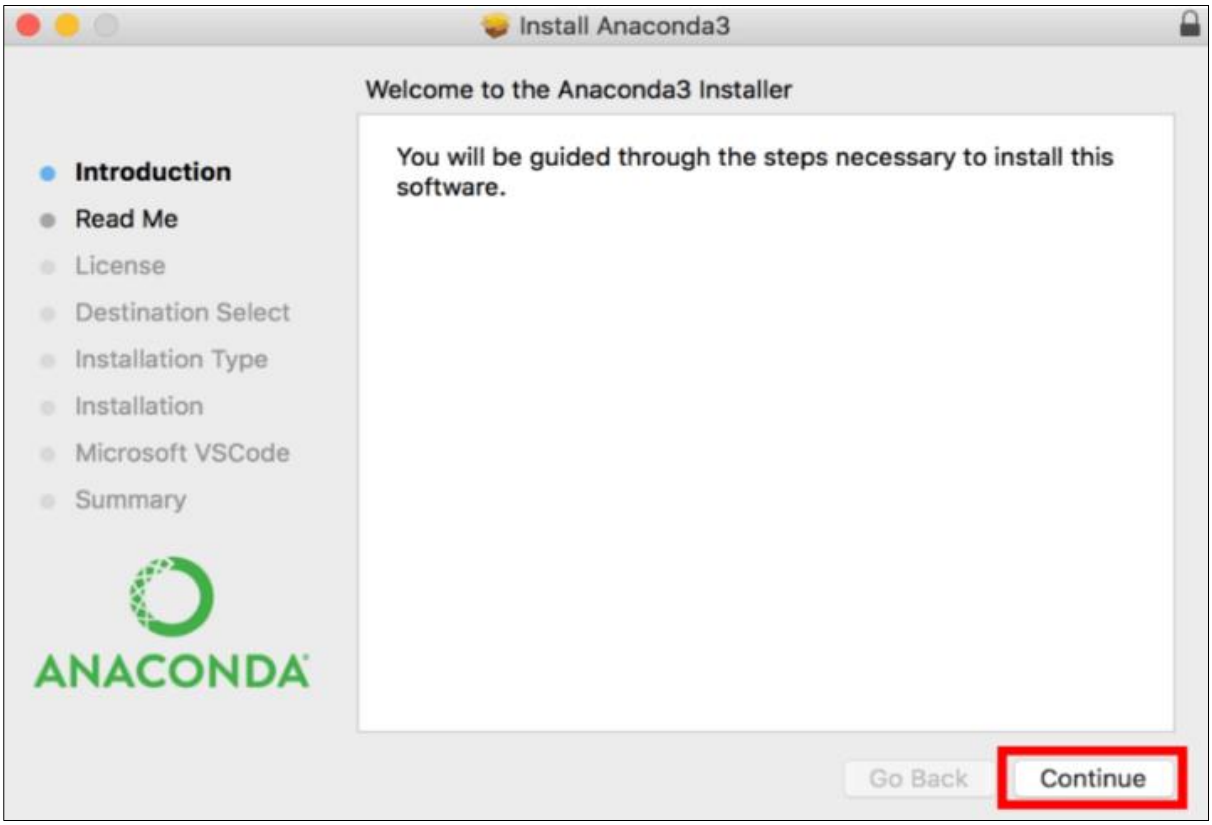


Click on **Download** and **Python 3.7 version** for macOS will be downloaded

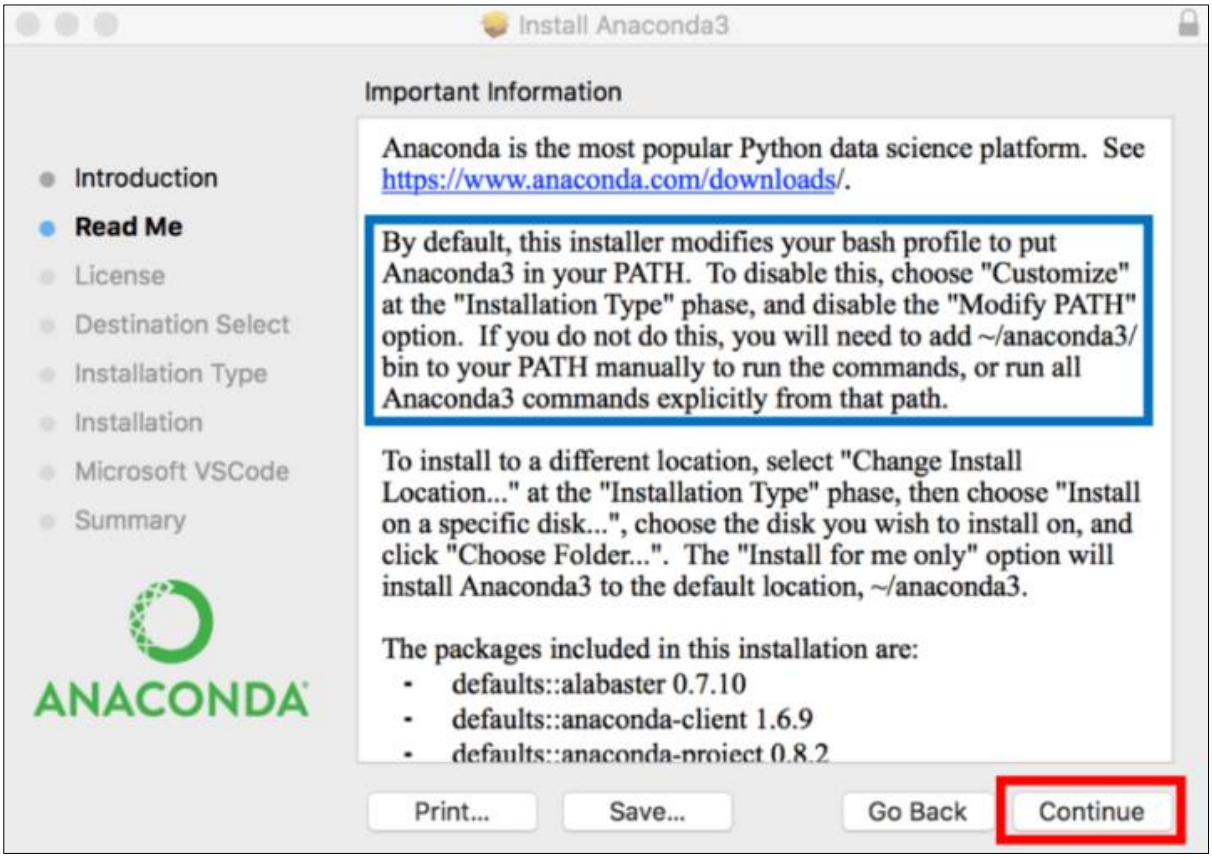
Run the downloaded file and the below window will be displayed.



Click on **Continue**

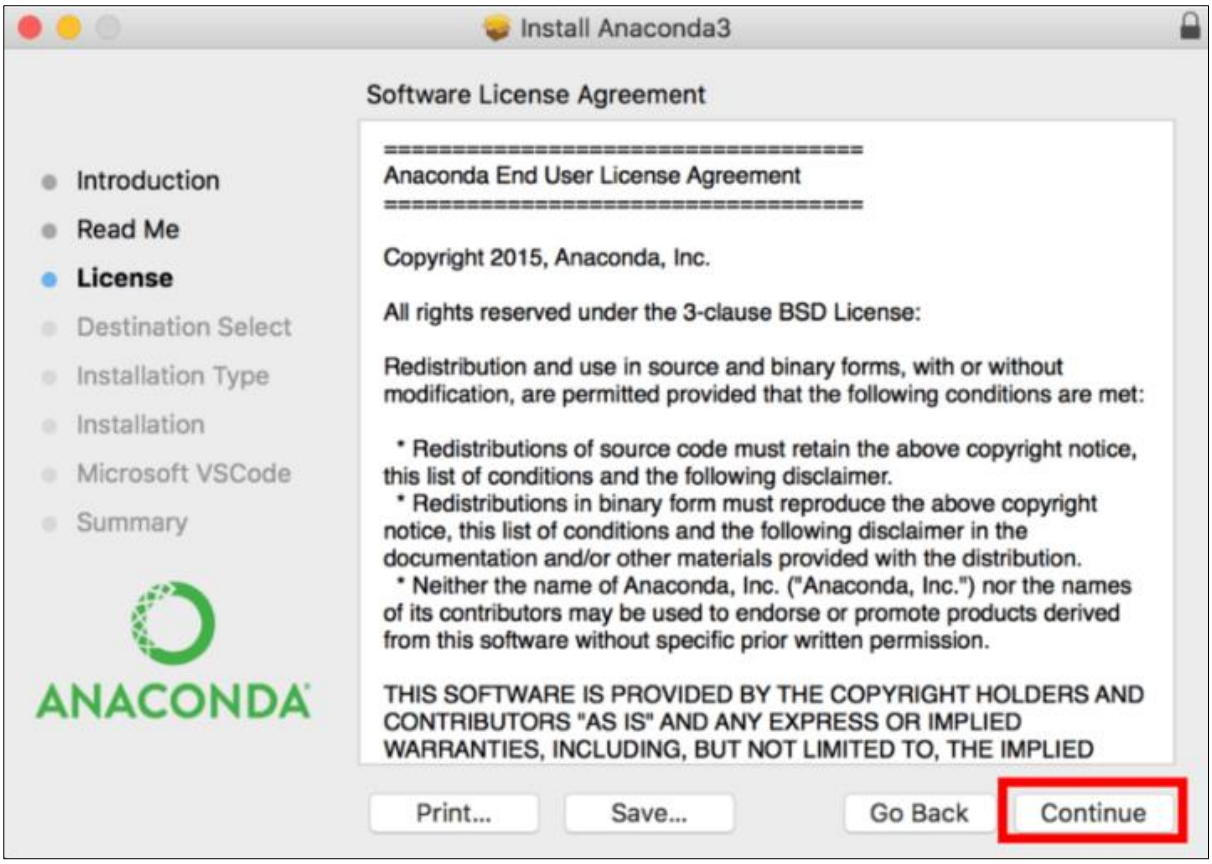


Click on **Continue**
Please note that while installing Anaconda on macOS, it will modify the bash file with Anaconda3.

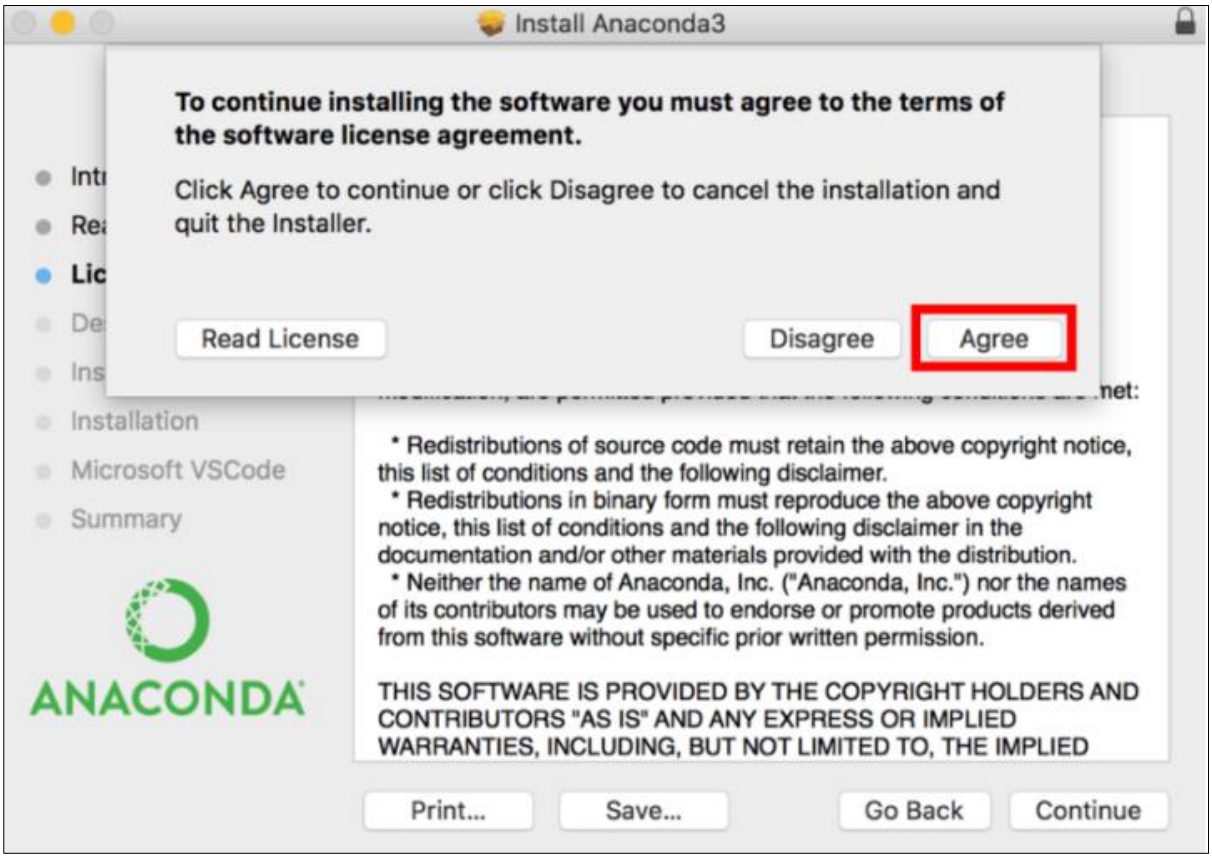


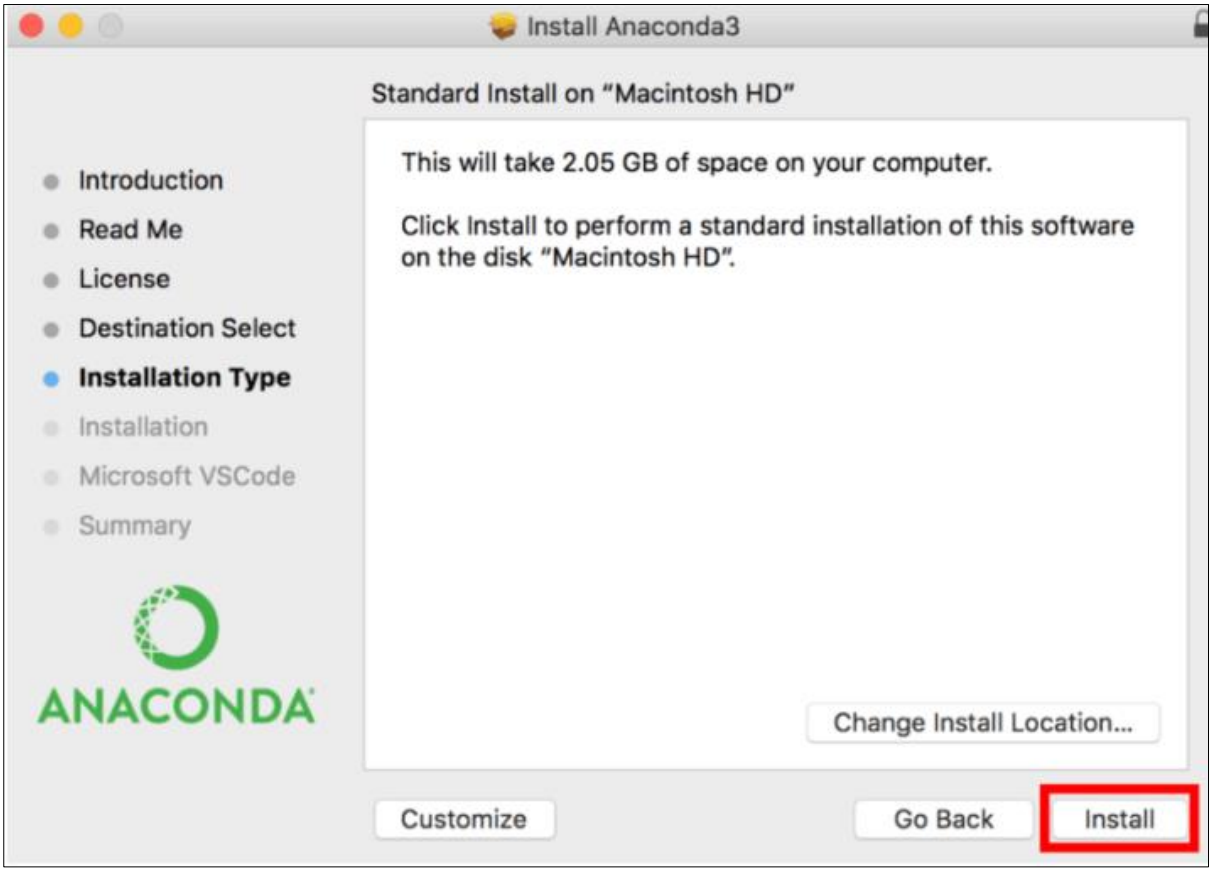
Click on **Continue** again.

Now, below **Software License Agreement** will appear.



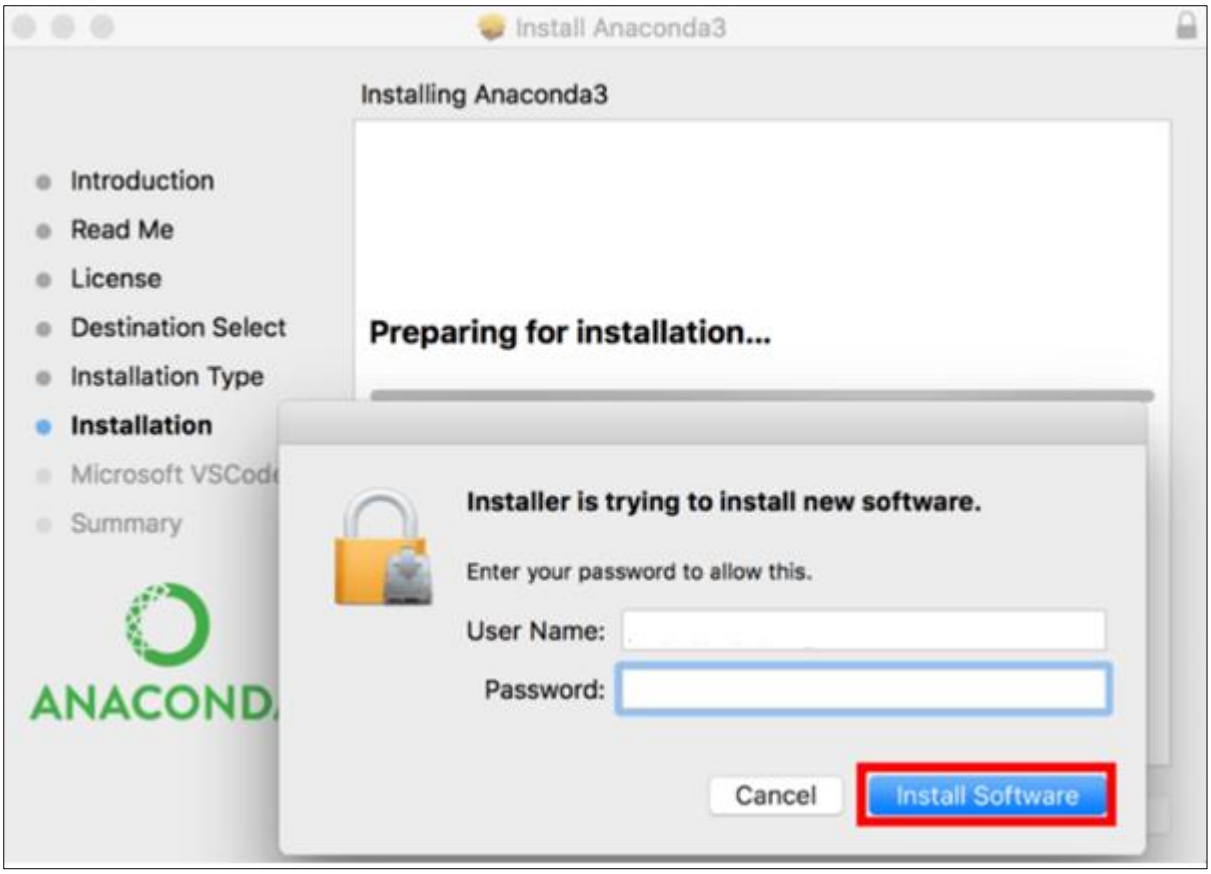
Read the Software License Agreement and click on **Continue**.



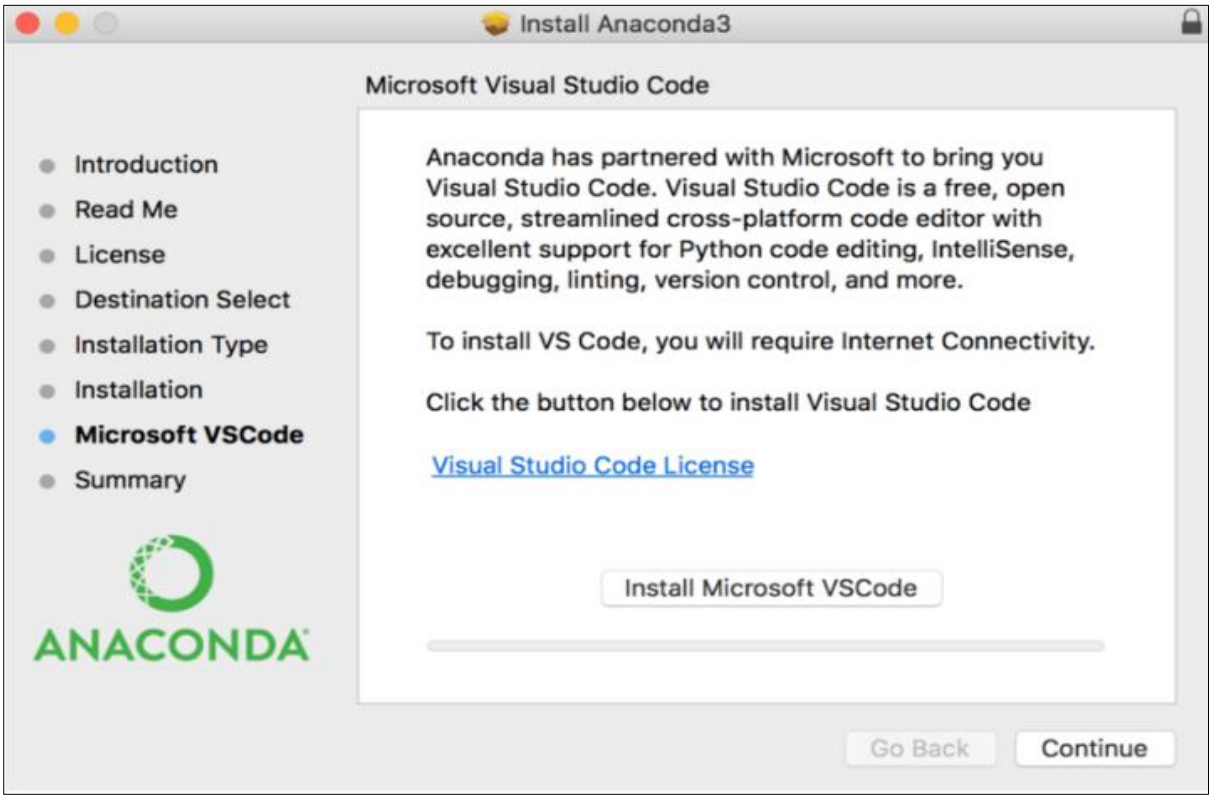


Click on **Install**.

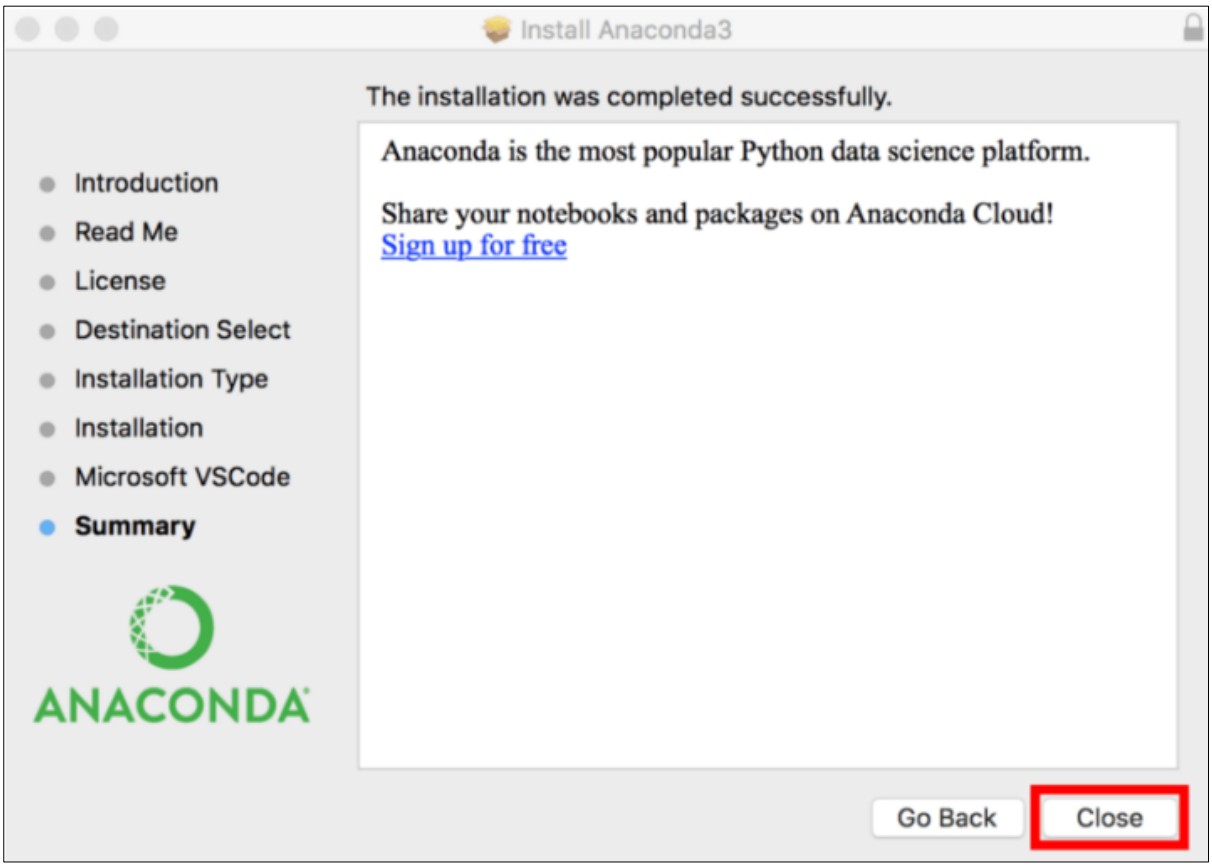
Now you will be asked to put your credentials. Use the same credentials that you have set for your mac to open the system. Once you enter the correct credentials, click on **Install Software**.



You will be prompted with the below window asking to install VSCode. VSCode is a code editor. We do not need that as we already have Spyder. Click on **Continue**.



Finally, a screen will be displayed mentioning that the installation was completed successfully [7]



Step 3: Now open the terminal and install the required packages by entering below commands-

```
pip install pycryptodome
```

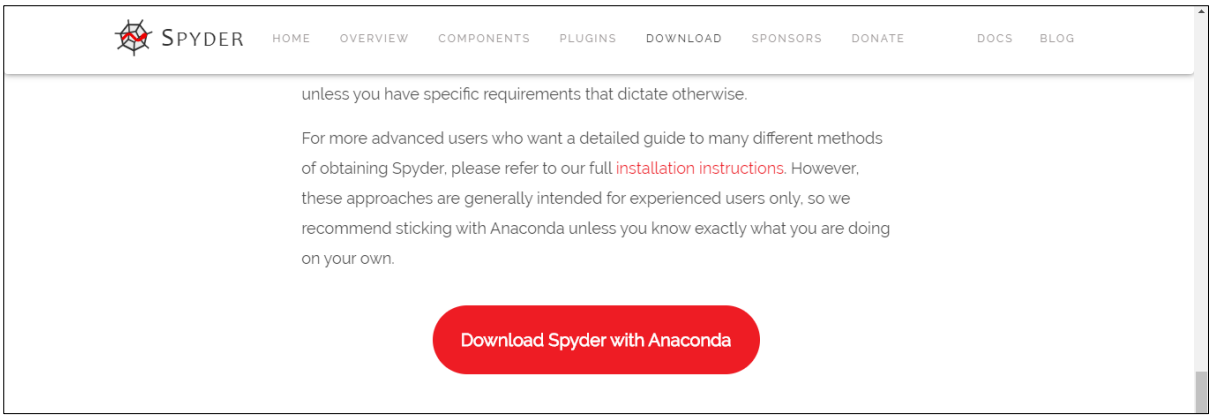
```
pip install simple-crypt
```

Step 4: Now the Anaconda 3 Distribution is ready to run the program on macOS.
Get to the directory where the program is stored by typing in the path and below command-

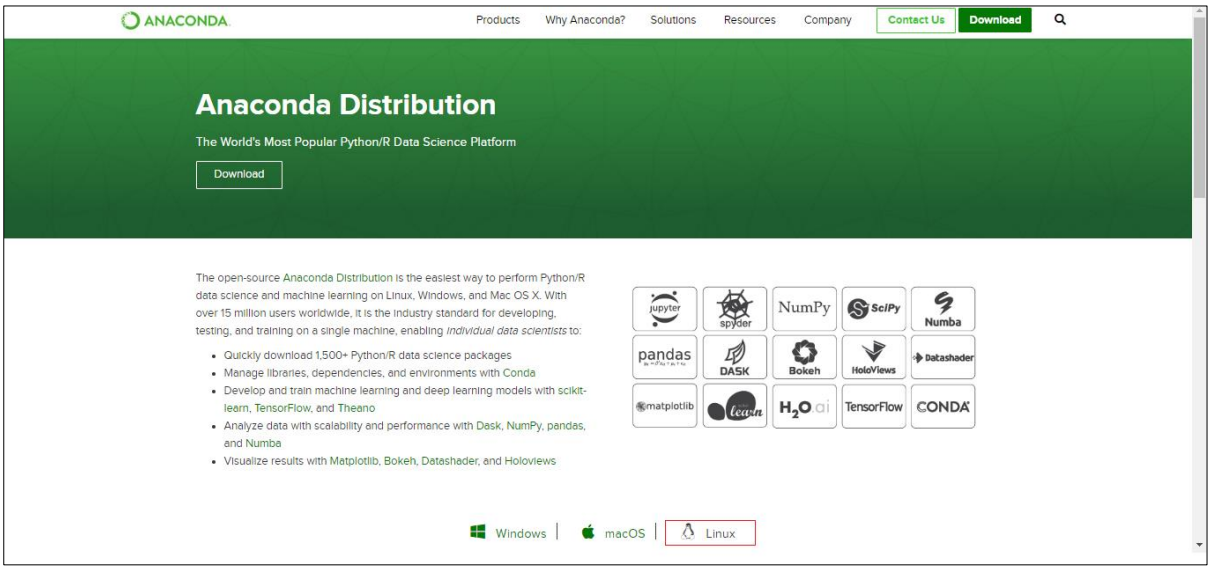
```
python stegnocode3.py
```

2.1.3 Linux

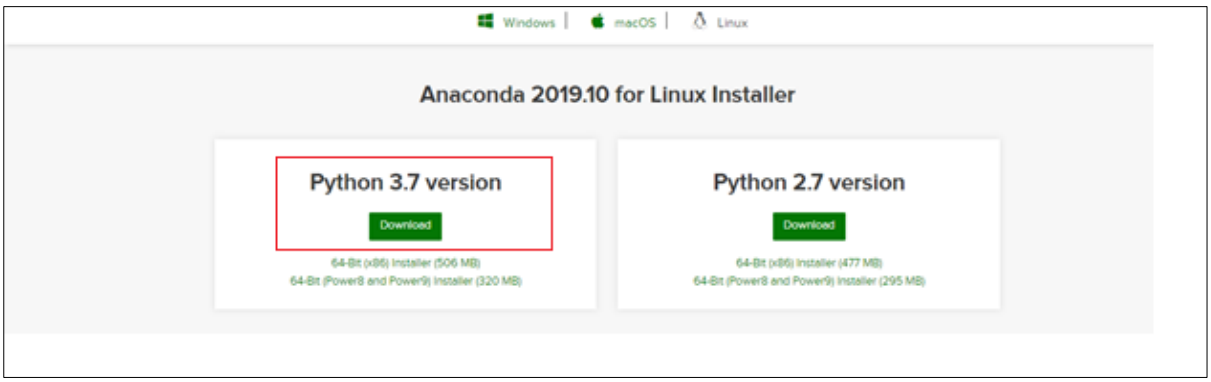
Step 1: Go to the official site of Spyder www.spyder-ide.org/ and click on **Download** as shown in the below figure.



Step 2: Now click on **Download Spyder with Anaconda** and it will redirect you to below page-



Click on Linux and below, you will see another window



Click on **Download** and **Python 3.7 version** for Linux will be downloaded

Step 3: Anaconda recommends verifying the integrity with SHA-256. Open the terminal on the Linux system and enter the below command [1].

```
sha256sum /path/filename
```

Step 4: Enter the following command to install Anaconda for Python 3.7

```
bash ~/Downloads/Anaconda3-2019.10-Linux-x86_64.sh
```

Replace **Downloads** in the path with the path where the downloaded installer file exists.

Step 5: Now a window will be displayed saying **In order to continue the installation process, please review the license agreement.** Click **Enter** to view the license agreement and type on **Yes** to agree.

```
Welcome to Anaconda3 2019.10

In order to continue the installation process, please review the
license
agreement.
Please, press ENTER to continue
>>>
...
Do you approve the license terms? [yes|no]
```

Step 6: Now you will be to choose the location for the installation. Press **Enter** to set the default location.

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

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

[/home/nilis/anaconda3] >>>
```

Step 7: Once the installation is successful, type **yes** to use conda command.

```
...
installation finished.
Do you wish the installer to prepend the Anaconda3 install location
to PATH in your /home/nilis/.bashrc ? [yes|no]
[yes] >>>
```

Step 8: Activate the installation using below command

```
source ~/.bashrc
```

Step 9: Type in conda command to test it working fine [8].

```
conda list
```

Step 10: Install the required packages by entering the below commands.

```
pip install pycryptodome
```

```
pip install simple-crypt
```

Step 11: Now the Anaconda 3 Distribution is ready to run the program on Linux.
Get to the directory where the program is stored by typing in the path and below command-

```
python stegnocode3.py
```

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