

# Installation of Required Technologies

This article explains how to set up and install the required technologies for this class.

## 1 Setting Up Python

We would be using Anaconda systems for our python development. The following are some general advice that I have:

- Do not install PyCharm (I personally do not like this editor at all).
- In installation of anaconda use all default (recommended) steps.
- Make sure you are using a python version that is  $\geq 3.5$
- Download Atom as a text editor (beginners/new to python) or stick to vim (the experts/immortals). Spyder is also a good alternative. (If you are unfamiliar with python/programming this may not make much sense now but you'll definitely understand more by the end of the installations.)

### 1.1 WINDOWS 10

- Follow along with these instructions - Anaconda for Windows

### 1.2 LINUX

- Follow along with these instructions - for Linux

### 1.3 MAC OS

- Follow along with these instructions - for Mac OS

## 2 Setting Up Jupyter-Notebook

Once Anaconda is installed. You should automatically have Jupyter-Notebook installed. Just execute the Anaconda Navigator on your OS and you should see the following screen.

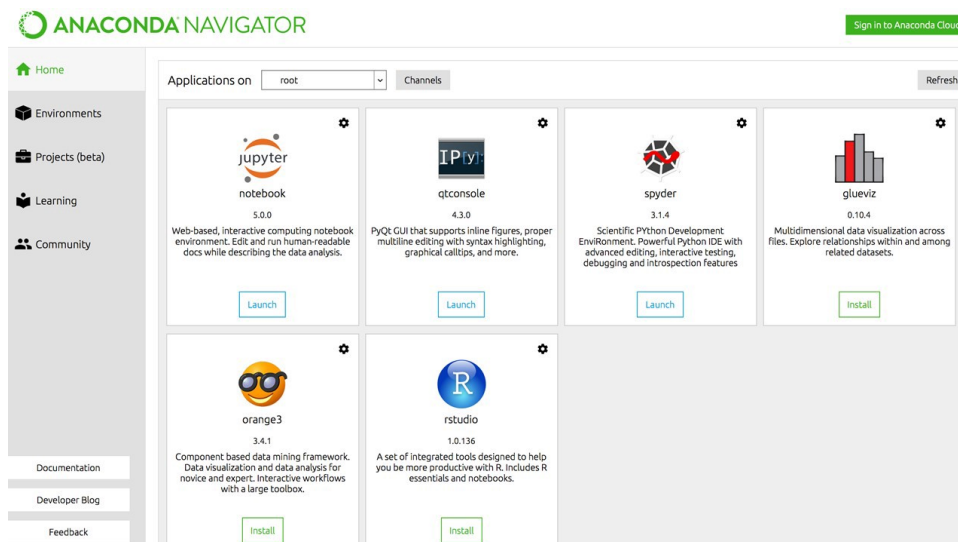


Figure 1: Anaconda Navigator Screen Capture

Click the "Launch" button on the Jupyter Notebook section to open Jupyter Notebook. A majority of our assignments will be through Jupyter Notebooks so make sure that this works on your system and that you can open ".ipynb" files using it.

To create a ".ipynb" after you launch Jupyter Notebook. Click on "New" and select "Python3". Make sure to be saving files in a separate dedicated directory to spare yourself headaches in the future (learnt it the hard way myself). The file created (see figure 3) is where you will be writing your python code. Try executing a hello world code (snippet below) to make sure things are working.

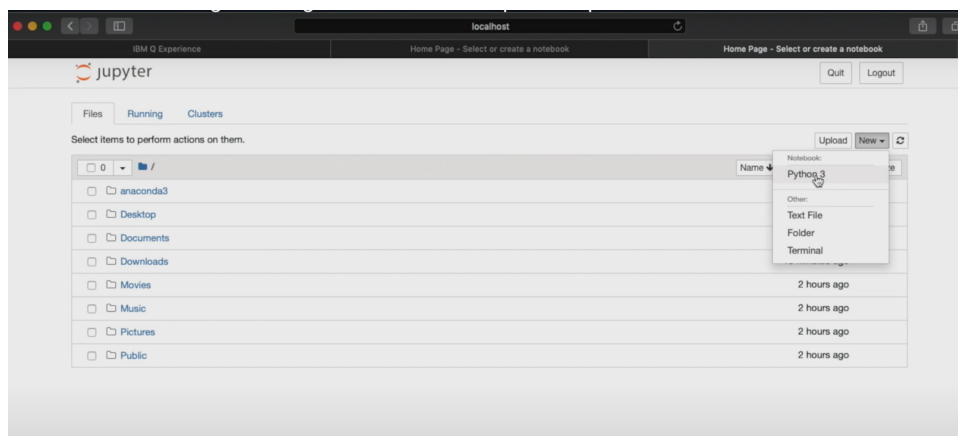


Figure 2: Jupyter Notebook Landing Page

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```
print("Hello World")
```

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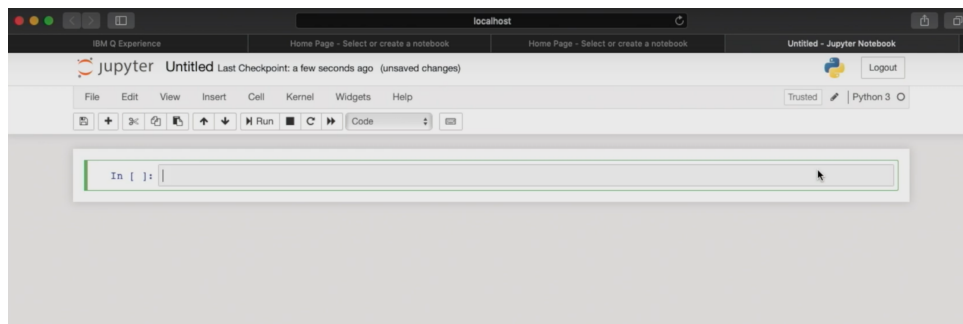


Figure 3: Jupyter Notebook Programming Page

## 3 Installing Qiskit

### 3.1 WINDOWS 10

After installing Anaconda, open the **Anaconda Prompt** through the search menu (see fig 4)

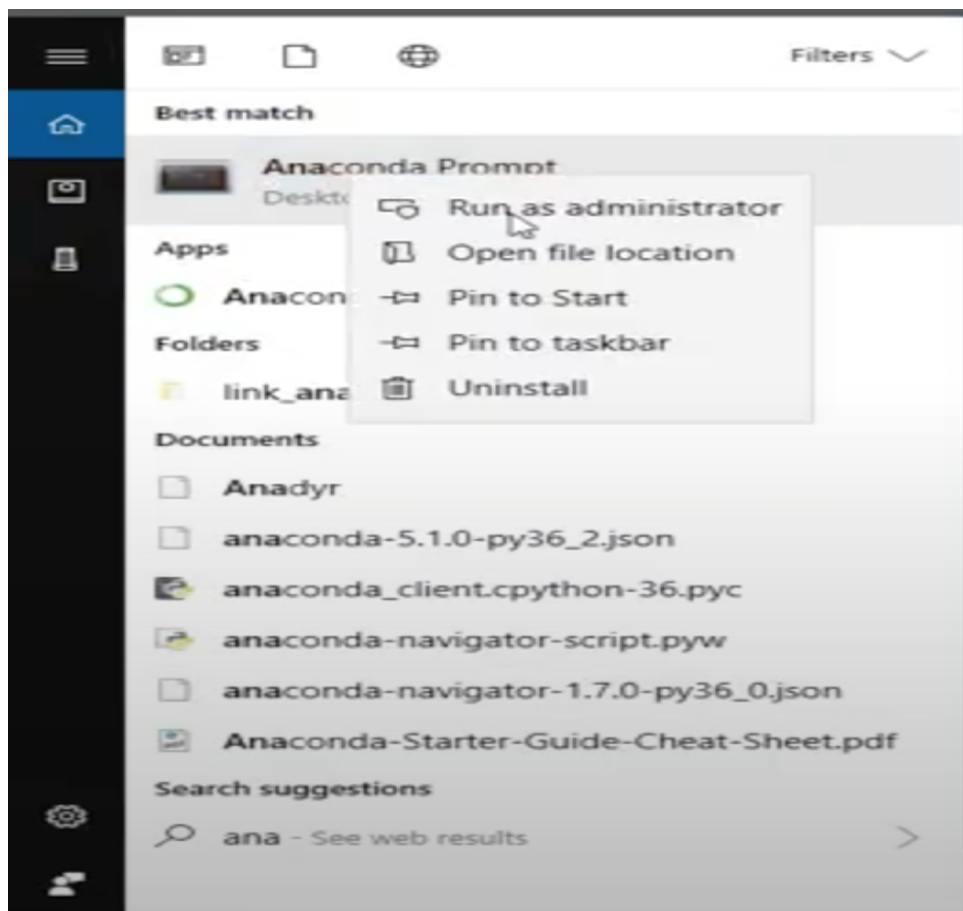


Figure 4: Launcing Anaconda Prompt

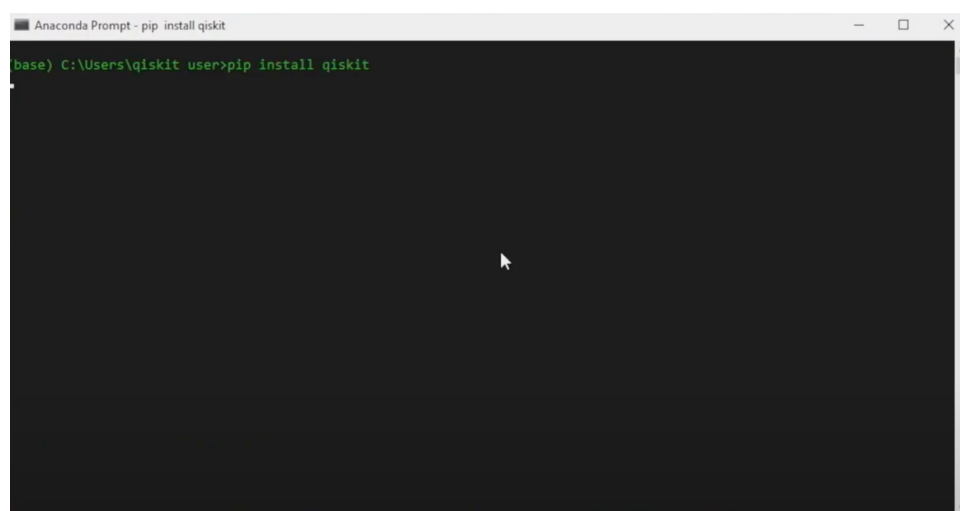


Figure 5: Command to install qiskit

After the Anaconda Prompt is open, execute the following command (Fig 5). Once, qiskit is installed, execute the following command within the prompt.

```
$ pip install qiskit
```

After the installation is over, execute the following command. The command should initiate the jupyter notebook interface, it is then in this window where we will be writing our programs using qiskit.

```
$ jupyter notebook
```

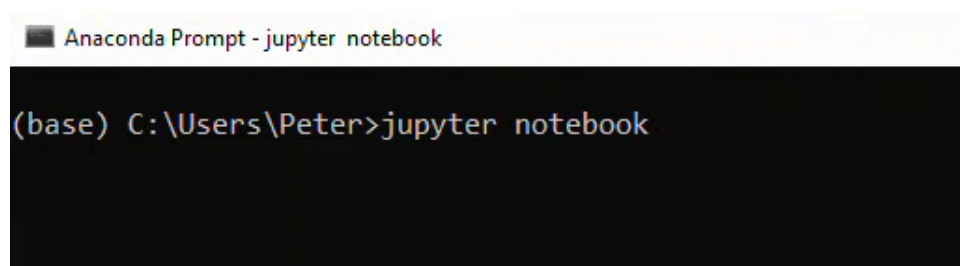
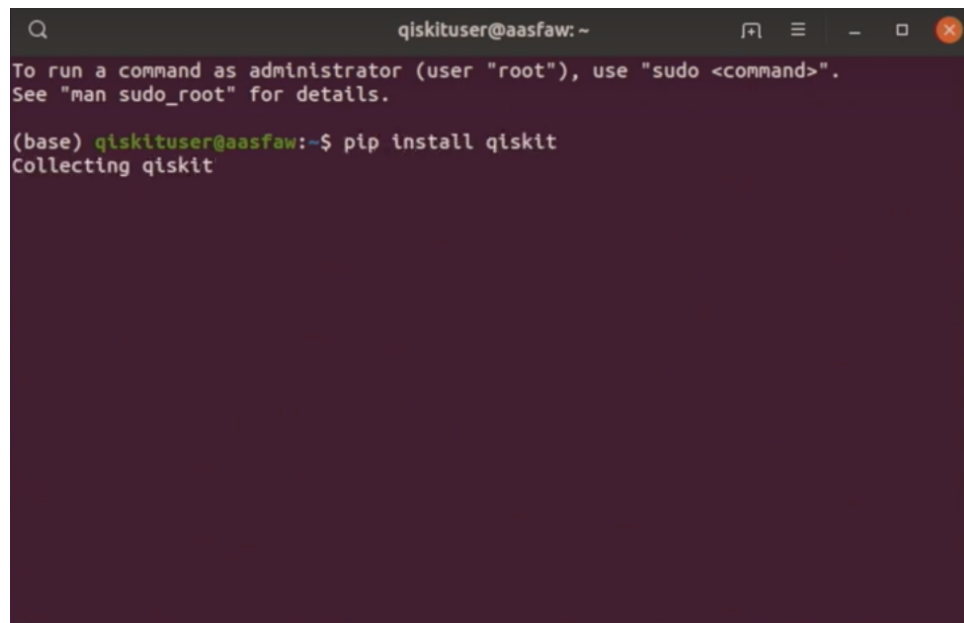


Figure 6: Command to launch Jupyter Notebook

## 3.2 LINUX and MAC OS

Both Linux and Mac OS have very similar process of installation since they are both UNIX based systems. Since both these OS comes with the Terminal app by default just search for it and then open it. Afterwards, execute the following command:

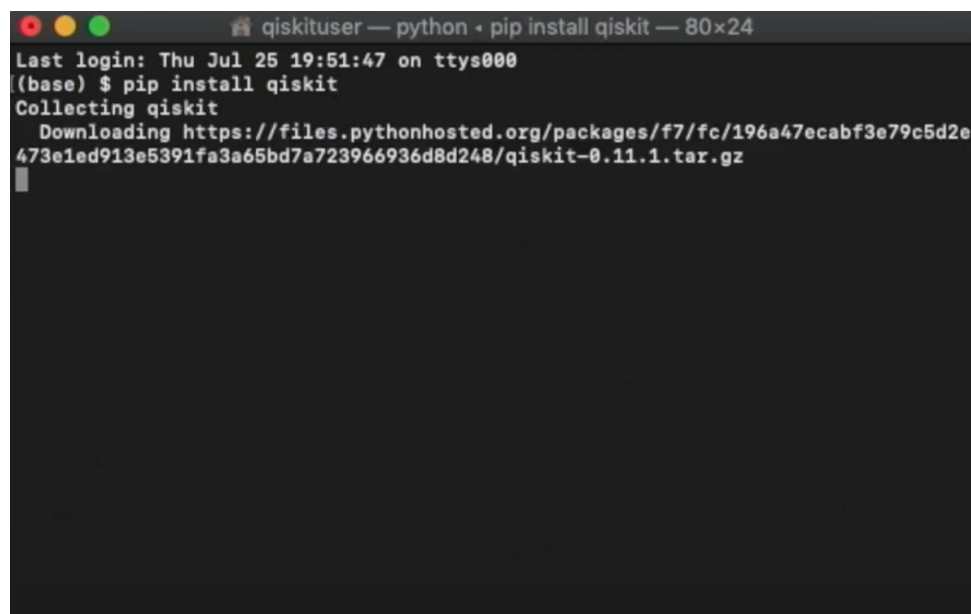
```
$ pip install qiskit
```

A screenshot of a Linux terminal window. The window title is 'qiskituser@aasfaw: ~'. The terminal shows a message about running commands as administrator, followed by the command '(base) qiskituser@aasfaw:~\$ pip install qiskit' and the output 'Collecting qiskit'.

```
qiskituser@aasfaw: ~
To run a command as administrator (user "root"), use "sudo <command>".
See "man sudo_root" for details.

(base) qiskituser@aasfaw:~$ pip install qiskit
Collecting qiskit
```

Figure 7: Command to install qiskit in Linux terminal

A screenshot of a Mac OS terminal window. The window title is 'qiskituser — python • pip install qiskit — 80x24'. The terminal shows the command '(base) \$ pip install qiskit' and the output 'Collecting qiskit' followed by the download URL for qiskit-0.11.1.tar.gz.

```
qiskituser — python • pip install qiskit — 80x24
Last login: Thu Jul 25 19:51:47 on ttys000
(base) $ pip install qiskit
Collecting qiskit
  Downloading https://files.pythonhosted.org/packages/f7/fc/196a47ecabf3e79c5d2e
473e1ed913e5391fa3a65bd7a723966936d8d248/qiskit-0.11.1.tar.gz
```

Figure 8: Command to install qiskit in Mac OS terminal

After the installation is over, execute the following command. The command should initiate the jupyter notebook interface, it is then in this window where we will be writing our programs using qiskit.

```
$ jupyter notebook
```

### 3.3 Testing out qiskit

Copy and paste the following code into the notebook and execute. Don't worry about what it means we will talk about that and more in the upcoming weeks. If the output is figure 9 then you are all ready for the course. If that is not so, please contact me over email and I can walk you through the issue.

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```

from qiskit import QuantumCircuit, execute, Aer
from qiskit.visualization import plot_histogram
n = 8
n_q = n
n_b = n
qc_output = QuantumCircuit(n_q,n_b)
for j in range(n):
    qc_output.measure(j,j)
qc_output.draw()

```

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```

In [1]: from qiskit import QuantumCircuit, execute, Aer
        from qiskit.visualization import plot_histogram
        n = 8
        n_q = n
        n_b = n
        qc_output = QuantumCircuit(n_q,n_b)
        for j in range(n):
            qc_output.measure(j,j)
        qc_output.draw()

```

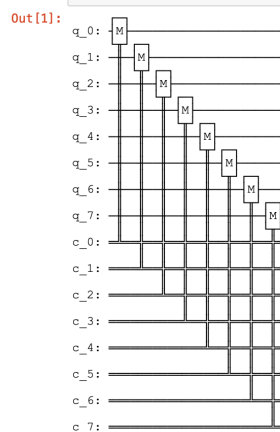


Figure 9: Sample program written in Qiskit