Introduction to Jupyter

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1 An Introduction to Jupyter Notebook

The Jupyter Notebook is an open-source web application that allows you to create and share documents that contain live code, equations, visualizations and narrative text. Uses include: data cleaning and transformation, numerical simulation, statistical modeling, data visualization, machine learning, and much more.

More information can be found on the Jupyter homepage.

Jupyter notebook is in that sense, a combination of Python and html, css and javascript interface. The text you are currently reading is input in a cell. The platform is activated by searching jupyter notebook in the search engine or can be found through Anaconda.

Cells can be added or removed by utilising the insert dropdown as well as the scissors icon located at the top of the page. A thorough list of Jupyter shortcuts can be found at Jupyter Shortcuts.

The most useful types of cells are Markdown and Code. Code initiates an ipython interface, where code can be executed. Similar to that of the python scripts variables can be stored in memory from cell to cell. Let us illustrate this with an example:

[2]:
```
#Define a Variable in the jupyter notebook cell.
jupyter_variable = [1,2,3]
#To run the cell, press run at the top of the page or press CTRL + Enter
```

[3]:
```
#Once the code is ran, the next cell will still be able to access the variable.
#The output is seen below
jupyter_variable
```

[3]:
```
[1, 2, 3]
```

The other type of useful cell is the markdown cell. This type of cell can be selected by highlighting the chosen cell and selecting markdown from the dropdown to the right of Run.

These cells operate using html, css and javascript in the same way that a normal website would. In addition, latex environments can be initiated in these cells using two dollar symbols, to open and close the latex environment. They offer a lot of flexibility and make a great teaching tool.

These files operate using a local html user interface. That being said, the document that you are currently reading has been converted to a PDF. In order to achieve this, you will need to have latex installed on your computer. Miktex or any other alternative will suffice. There are several ways to convert the notebook to PDF.

1) File -> Download as -> Latex (.tex) (recommended)
    a) Load the .tex file into your chosen compiler and run it.
2) File -> Download as -> PDF via Latex (.pdf)

Both of these options will require the chosen latex platform.

That being said, the majority of the time Jupyter is used with a HTML interface. In this platform, the notebook can add sliders, buttons and various other widgets to achieve the desired goal.

To conclude, let us perform a series of simple tasks to summarize the aforementioned details.

[4]:
```
5+5
```

[4]:
```
10
```

[5]:
```
for i in range(3):
    print('The number is :',i)
```

```
The number is : 0
The number is : 1
The number is : 2
```

[6]:
```
def simple_sum(n):
    return (n)*(n+1)/2
```

[7]:
```
simple_sum(5)
```

[7]:
```
15.0
```