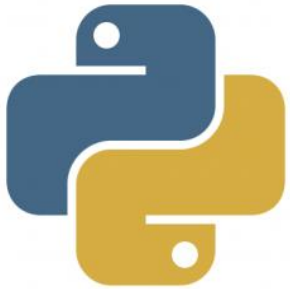
Introduction to



python

for Data Analysis

Course Outline

- Introduction to Python for Data Analysis
- Introduction to Python Data Types
- Introduction to Pandas (Series & Dataframe)
- Python Input/Output (xlsx, csv, sql, html)
- Data Exploration with Python
- Data Cleaning with Python
- Data Wrangling with Python
- Data Visualization with Matplotlib/Seaborn

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Why Python For Data Analysis?

- Built for Speed
- Very simple and easy to learn
- Powerful libraries for everything
- Free and open- source
- It offers more ready-made tools for technologies such as data science, machine learning, artificial intelligence and robotics than other languages.

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What is Anaconda?

- Anaconda is a free and open source distribution of R and Python languages. Focused on providing the tools necessary for Data science.
- In it, you will find the Anaconda Navigator, which is the graphical alternative to the command-line interface. This makes it easy for users to launch applications and manage packages and environments without using the command-line commands.

Anaconda Navigator

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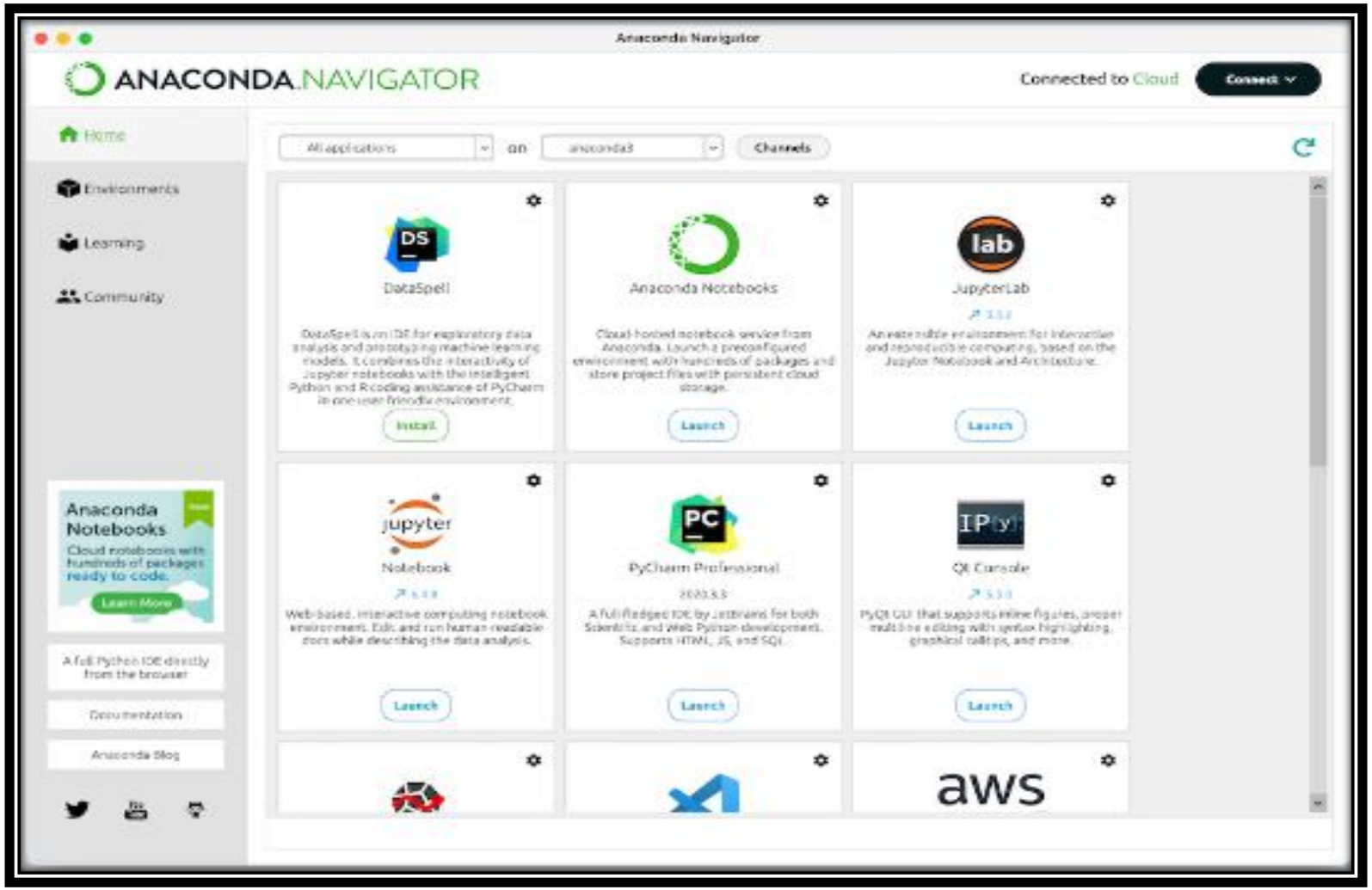
jupyter Notebook

Anaconda houses multiple other software's including

JUPYTER NOTEBOOK



Jupyter Notebook

- Originally called Ipython, the name Jupyter comes from the fact that it supports writing code in three popular languages: Julia and Python and R which are popular for data science.
- Jupyter Notebook is an open source, web based interface application which accommodates live code and visualization all in one place.
- Supports more than 40 programming languages.

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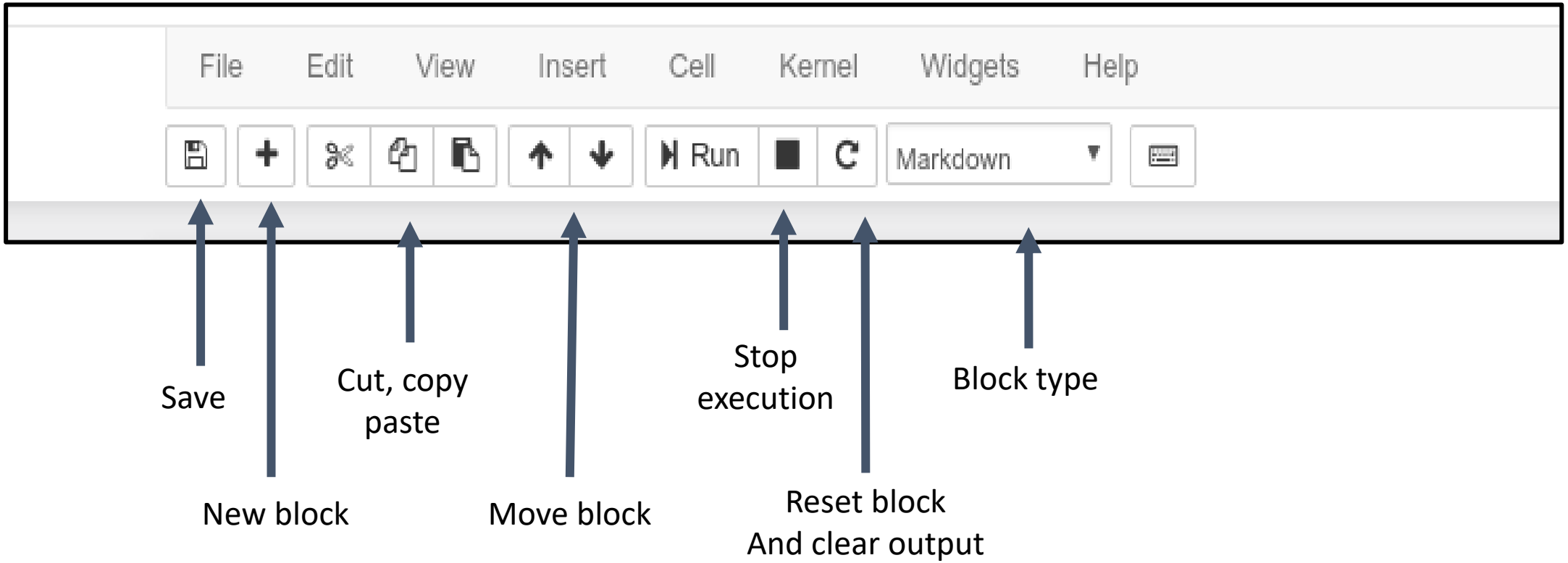
Exploring the Interface



jupyter Notebook

Working Modes

- **THE COMMAND MODE (The Blue Cell):** The command mode essentially means you're in command of everything i.e. you can add a cell, delete a cell.
- **THE EDIT MODE (The Green Cell):** The edit mode means you're in the cell. Essentially means you can edit a cell. When you want to get out the edit mode, you press the ESC button.

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Lets have a comment!

- Comments are useful when your code needs further explanation either for your future self and anybody else.
- Useful when you want to remove the code from execution but not permanently
- Comments in Python are done with #

NOTE: The shortcut of (Ctrl + /) can also be very handy

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Assignment Statement

Assignment statement simply means taking something and assigning it to something else(or an object).

For example

```
x = 5
name = “Ben”
age = 49
```

Python is an OOP (Object Oriented Programming) Language

which means that every thing can be kept inside an object

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Print Statement

We can print any statement on console in python using the **PRINT** keyword

```
print()

print("This is my first program")

print('My name is', name)

print('My number is' + name)

print('My number is {}'. format(name))
```


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Variables

VARIABLE		REASON
var1	Valid	Starts with letter
var1?	Invalid	Only _ is allowed
var1_	Valid	Starts with letter and contains _
1var	Invalid	Starts with number
_ var	Valid	Can start with _
_1var	Valid	Can start with _
var_1	Valid	_ and numbers are allowed
. var	Invalid	Can only start with _ or A-Z or a-z

- Variables are defined to store values such as characters (text), integers (numbers), Boolean values (True or False) etc.
- Variable name must start with only letter or underscore (not number)
- Variable name should contain only number, letter or underscore

Python Datatypes

Data Type	Example
Integer	5, 10, 22, 36
Float	5.2, 3.6, 5.3
Complex	3 + 4j, 2j
Boolean	True, False
String	“Hello”, “23.5”
List	[1,2,3, “Hello”, True]
Tuple	(1,2,3, “Hello”, True)
Set	{1,2,3, “Hello”, True}
Dictionary	{“Name” : “Sam”, “Age” : 15}

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Common Python Libraries

- **Pandas:** The cornerstone of our data analysis with python
- **Matplotlib:** The foundational library for visualization.
- **Numpy:** The numeric library for all calculation in Python.
- **Seaborn:** A statistical visualization tool built on top of matplotlib
- **Statsmodels:** A library with many advanced statistical functions
- **Scipy:** Advanced scientific computing
- **Scikit-learn:** The most popular machine learning library

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