All You Need to Know
Python Fundamentals

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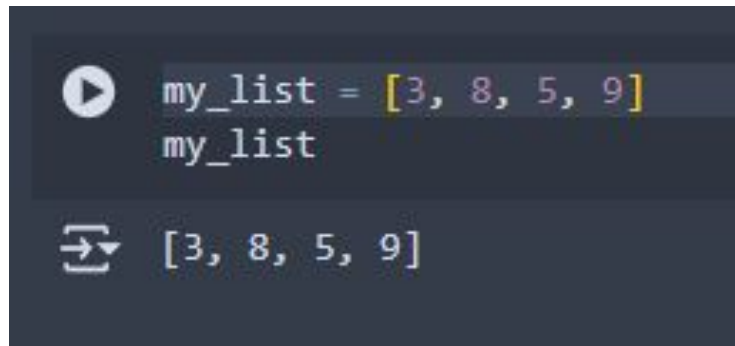
Agenda

➡️ **Navigating Jupyter Notebook**
- Working with variables
- Functions
- Packages
- Plotting

Navigating Jupyter Notebook

- **Definition:** tool for writing, developing, and presenting code
  - Think of a school notebook!
- **We're going to use Google Colab to host the Jupyter Notebook**
- **Main Components of Jupyter Notebook**
  - **Runtime** - Running code
  - **Creating a Text Block** - where you write text that won't run (e.g. comments, title of coding section)
  - **Creating a Code Block** - where you write code
    - **Play Button:** Running code for a single block of code
    - **Actual Code**
    - **Output**

Runtime — **Where to run all the code blocks**

+ Text — **Create a Text Block** (where you can write text that won't be run [e.g. comments])

+ Code — **Create a Code Block** (where you can write code)

```
my_list = [3, 8, 5, 9]
my_list

[3, 8, 5, 9]
```

Code Block Components:
- **Play Button:** Where you can run code for a single block
- **Actual Code**
- **Output**

Text Block: Where you can write comments/notes & it will not be read by the computer when code is run

∨ 1. Python and notebook basics

In this Jupyter notebook, we will cover the very essentials of Python and notebooks such as creating a variable, importing packages, using functions, seeing how variables behave in the notebook etc. This very short introduction will prepare you to quickly dive into more applied machine learning projects without having to go through a full Python introduction.

∨ Variables

Like we would do in mathematics when we define variables in equations such as $x = 3$, we can do the same in all programming languages. Python has one of the simplest syntax for this, i.e. exactly as we would do it naturally. Let's define a variable in the next cell:

```
[ ]   a = 3
      a

⇄    3
```

Code Block: Where you can write code

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Working with Variables

- **Simple Definition**: Stores data

	Integers	Character	String	List
Definition	Continuous numbers	Single letter or character	Collection of letters	Group of variables
Assigning Value to Variables	Just the value x = 1	Needs a ' ' around the char x = 'a'	Needs a " " around the string x = "Hello!"	Needs a [] around the list x = ["Apple", "Peach"]
Examples	1, 2, 3	A, a, @, h	"Hello World"	["strawberry", "banana"]

Working with Variables

- **Purpose:**
  - Reduces redundancy
  - Can perform arithmetics on them
    - Integer + Integer is simple addition
    - String + String is concatenation

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Functions

- **Purpose:**
  - Creating an algorithm to accomplish a task
- Expand beyond simple arithmetic such as +, -, //, etc.
- Helps with redundancy
- How to:
  - Define the function & its steps
  - Call/Use the function, and it'll run the steps given any inputs

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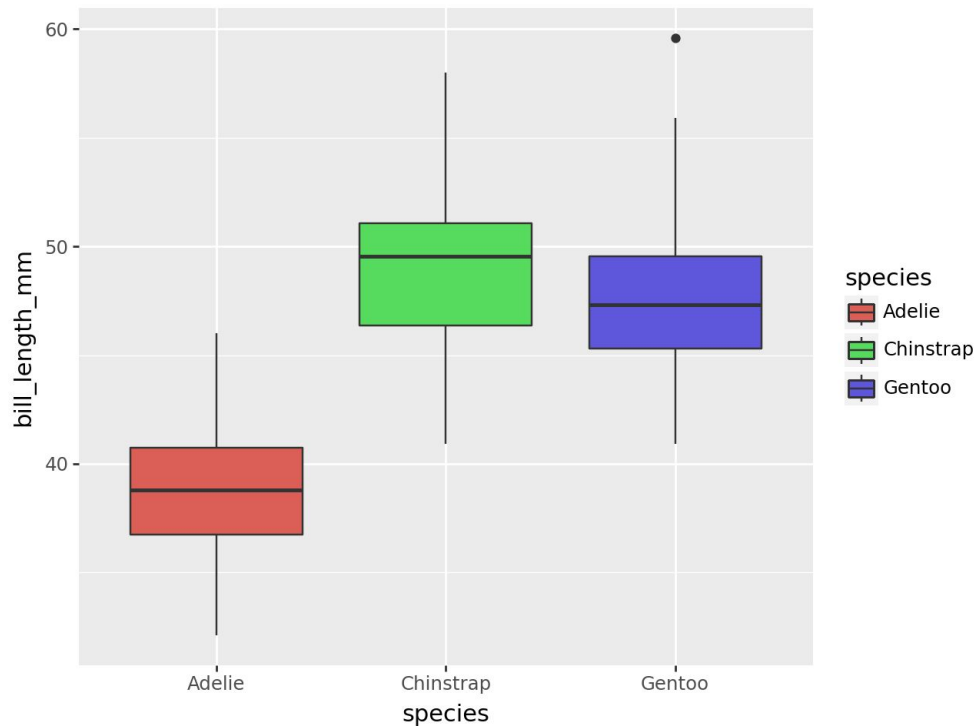- **Packages**
- Plotting

Packages

- **Definition:**
  - Collections of functions for specific purposes
- Available for everyone to use via specialized repositories
- **Example:**
  - Data Science uses pandas that allows us to create, manipulate, and utilize data frames
  - Plotting data uses packages like plotnine, seaborn

Agenda

- ~~Navigating Jupyter Notebook~~
- ~~Working with variables~~
- ~~Functions~~
- ~~Packages~~
- ➡ **Plotting**

Plotting

- **Simple Definition:**
  - Data Visualization
- **Examples of Plots**:
  - Scatter plots
  - Box Plot
  - Bar Graphs
  - Heatmap
  - Images

[Access this Lesson's Jupyter Notebook Here!](#)