

Dive into Python

INTRODUCTION TO DATA SCIENCE IN PYTHON



Hillary Green-Lerman

Lead Data Scientist, Looker

What you'll learn

- How to write and execute Python code with DataCamp
- How to load data from a spreadsheet
- How to turn data into beautiful plots

Solving a mystery with data



Using the IPython shell

datacamp

← Course Outline →

🟢 📺 ⓘ

Exercise

Importing Python modules

Modules (sometimes called *packages* or *libraries*) help group together related sets of tools in Python. In this exercise, we'll examine two modules that are frequently used by Data Scientists:

1. `statsmodels` : used in machine learning; usually aliased as `sm`
2. `seaborn` : a visualization library; usually aliased as `sns`

Note that each module has a standard alias, which allows you to access the tools inside of the module without typing as many characters. For example, aliasing lets us shorten `seaborn.scatterplot()` to `sns.scatterplot()`.

Instructions 1/3

35 XP

1

- In the script editor, use an `import` statement to import `statsmodels`.

Take Hint (-10 XP)

2

- Add an `as` statement to alias `statsmodels` to `sm`.

3

- Add an `as` statement to alias `seaborn` to `sns`.

script.py

1

↺

Run Code

Submit Answer


IPython Shell

In [1]:

datacamp

INTRODUCTION TO DATA SCIENCE IN PYTHON

Using the script editor

 datacamp

← Course Outline →

Exercise

Importing Python modules

Modules (sometimes called *packages* or *libraries*) help group together related sets of tools in Python. In this exercise, we'll examine two modules that are frequently used by Data Scientists:

1. `statsmodels` : used in machine learning; usually aliased as `sm`
2. `seaborn` : a visualization library; usually aliased as `sns`

Note that each module has a standard alias, which allows you to access the tools inside of the module without typing as many characters. For example, aliasing lets us shorten `seaborn.scatterplot()` to `sns.scatterplot()`.

Instructions 1/3

35 XP

1

- In the script editor, use an `import` statement to import `statsmodels`.

Take Hint (-10 XP)

2

- Add an `as` statement to alias `statsmodels` to `sm`.

3

- Add an `as` statement to alias `seaborn` to `sns`.

script.py

1 |

↺

Run Code

Submit Answer

IPython Shell

In [1]:

What is a module?

- Groups related tools together
- Makes it easy to know where to look for a particular tool

- Common examples:

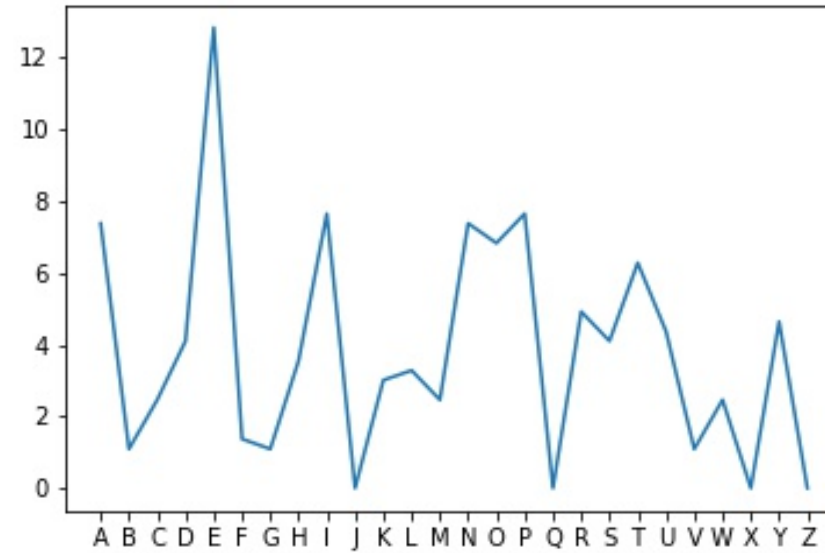
- matplotlib
- pandas
- scikit-learn
- scipy
- nltk

Importing pandas and matplotlib

```
import pandas as pd
from matplotlib import pyplot as plt
```

```
# Pandas loads our data
df = pd.read_csv('ransom.csv')

# Matplotlib plots and displays
plt.plot(df.letters, df.frequency)
plt.show()
```



Importing a module

- Importing a Module

```
import pandas
```

- Importing a module with an alias

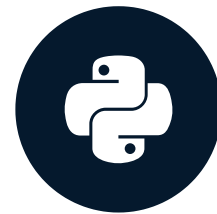
```
import pandas as pd
```


Let's practice!

INTRODUCTION TO DATA SCIENCE IN PYTHON

Creating variables

INTRODUCTION TO DATA SCIENCE IN PYTHON



Hillary Green-Lerman

Lead Data Scientist, Looker

Filing a missing puppy report



```
name = "Bayes"  
height = 24  
weight = 75.5
```

Rules for variable names

- Must start with a letter (usually lowercase)
- After first letter, can use letters/numbers/underscores
- No spaces or special characters
- **Case sensitive** (`my_var` is different from `MY_VAR`)

Valid Variables

`bayes_weight`

`b`

`bayes42`

Invalid Variables

`bayes-height`

`bayes!`

`42bayes`

Error messages

```
bayes-height = 3
```

```
File "<stdin>", line 1
    bayes-height = 3
                  ^
```

```
SyntaxError: can't assign to operator
```

Floats and strings

- *float*: represents an integer or decimal number

```
height = 24  
weight = 75.5
```

- *string*: represents text; can contain letters, numbers, spaces, and special characters

```
name = 'Bayes'  
breed = "Golden Retriever"
```

Common string mistakes

- Without quotes, you'll get a name error.

```
owner = DataCamp
```

```
File "<stdin>", line 1, in <module>
    owner = DataCamp
NameError: name 'DataCamp' is not defined
```

- If you use different quotation marks, you'll get a syntax error.

```
fur_color = "blonde'
```

```
File "<stdin>", line 1
    fur_color = "blonde'
                    ^
SyntaxError: EOL while scanning string literal
```

Displaying variables

```
name = "Bayes"  
height = 24  
weight = 75  
  
print(height)
```

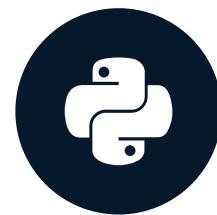
24

Let's practice!

INTRODUCTION TO DATA SCIENCE IN PYTHON

What is a function?

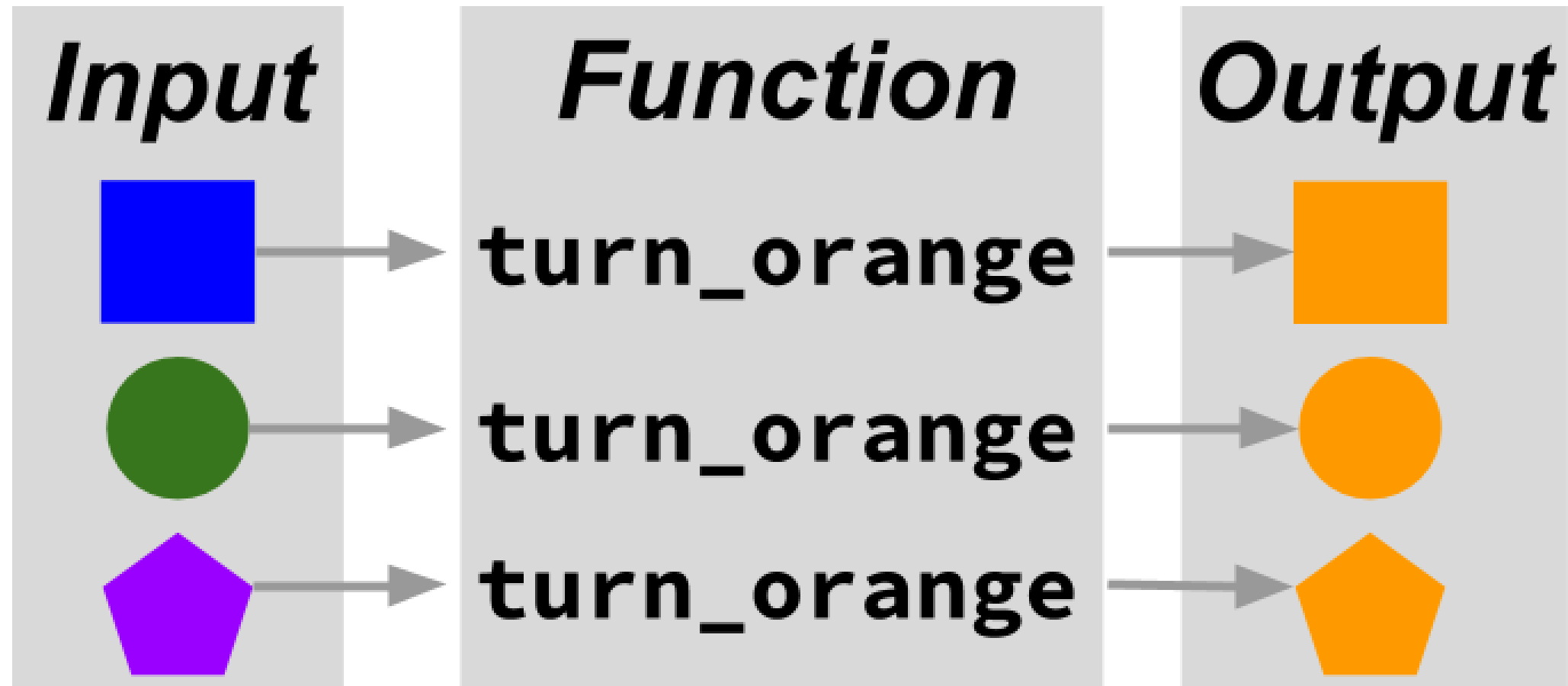
INTRODUCTION TO DATA SCIENCE IN PYTHON



Hillary Green-Lerman

Lead Data Scientist, Looker

A function is an action



Functions in code

```
import pandas as pd
from matplotlib import pyplot as plt

df = pd.read_csv('letter_frequency.csv')

plt.plot(df.letter_index, df.frequency, label='Ransom')
plt.show()
```

Functions perform actions:

- `pd.read_csv()` turns a csv file into a table in Python
- `plt.plot()` turns data into a line plot
- `plt.show()` displays plot in a new window

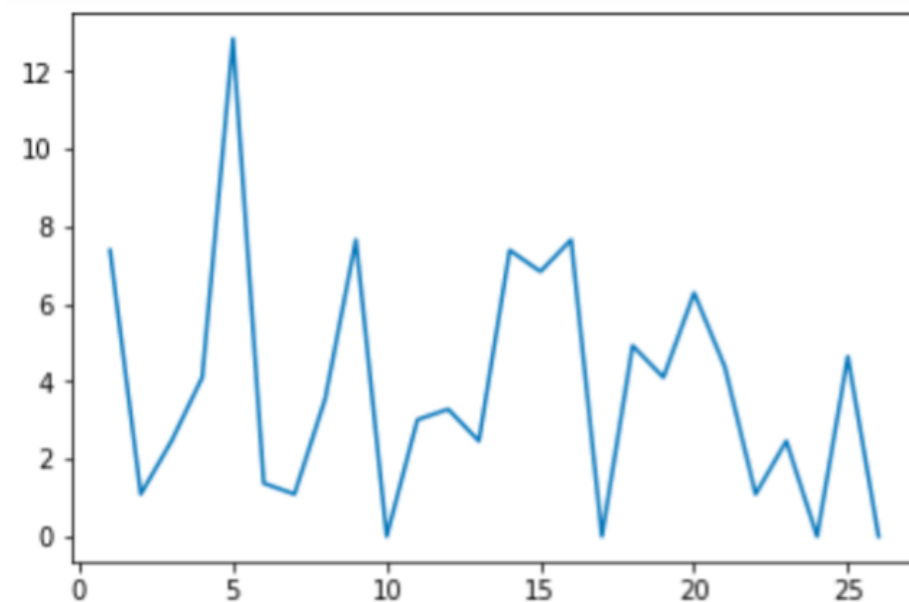
```
plt.plot(df.letter_index, df.frequency, label='Ransom')
```

Function

Positional Arguments

Keyword Argument

letter_index	letter	frequency
1	A	7.38
2	B	1.09
3	C	2.46
4	D	4.10
...



6. Anatomy of a function: positional arguments

Positional arguments are one type of input that a function can have. Positional arguments must come in a specific order. In this case, the first argument is the x-value of each point, and the second argument is the y-value of each point. Each argument is separated by a comma. If you forget the comma, you will get a syntax error. It's good practice to put a space after the comma, but your code will run even if you forget that space. Keyword arguments come after

Anatomy of a function: function name

```
plt.plot(df.letter_index, df.frequency, label='Ransom')
```

Function

Function Name:

- Starts with the module that the function "lives" in (`plt`)
- Followed by the name of the function (`plot`)
- Function name is always followed by parentheses (`()`)

Anatomy of a function: positional arguments

```
plt.plot(df.letter_index, df.frequency, label='Ransom')
```



Positional Arguments

X

Y

Positional Arguments:

- These are *inputs* to a function; they tell the function how to do its job
- **Order matters!**

Anatomy of a function: keyword arguments

```
plt.plot(df.letter_index, df.frequency, label='Ransom')
```

Keyword Argument

Keyword Arguments:

- Must come *after* positional arguments
- Start with the name of the argument (`label`), then an equals sign (`=`)
- Followed by the argument (`Ransom`)

Common function errors

- Missing commas between arguments

```
plt.plot(df.letter_index df.frequency, label='Ransom')
```



Missing commas!

The diagram shows two red circles, one at the end of 'df.letter_index' and one at the end of 'df.frequency'. A red arrow points from the space between these two arguments to the text 'Missing commas!'.

- Missing closed parenthesis

```
plt.plot(df.letter_index, df.frequency, label='Ransom')
```



Missing parenthesis!

The diagram shows a red circle at the end of the string 'Ransom'. A red arrow points from the text 'Missing parenthesis!' to this circle.

Let's practice!

INTRODUCTION TO DATA SCIENCE IN PYTHON