Introduction to Pandas

(Relational Data)

By Gideon & Sandra

"aimed at getting you to kickass in AI"

No! this class is not about the Pandas bear.

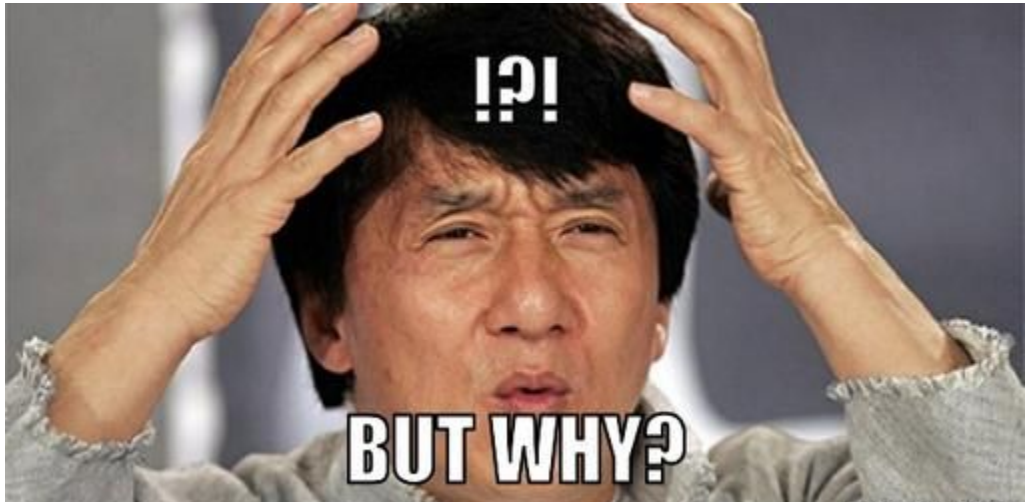
Sorry to disappoint! Source

What is Pandas?

Think of Pandas as an Excel sheet, but a next level Excel sheet with more features and flexibility than Excel. pandas is a python library used for data manipulation and analysis. It is designed to make working with "**relational**" or "**labeled**" data both easy and intuitive.

Source

Why Pandas?
Why so Famous?



Source

Why Pandas? Why so Famous?

- Open Source
- Easy to Learn
- Great Community
- Easy to Analyze and pre-process data in it
- Built-in Data Visualization
- Built-in support for CSV, SQL, HTML, JSON, pickle, excel, and a lot more
- It is built on top of Numpy
- and a lot more

What can I use Pandas for?

What can I use Pandas for?

- Data cleansing
- Data fill
- Data normalization
- Data visualization

- Statistical analysis
- Data inspection
- Loading and saving data
- And much more

Pandas Data Structures

Pandas is a Python package for data analysis and it supports two main types of Data Structures.

Series and DataFrames!

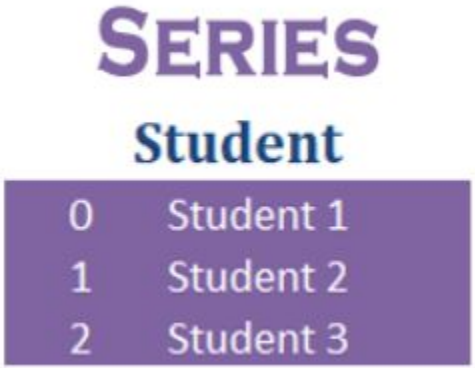
Series : It is a one dimensional labeled array

DataFrame: It is a two dimensional labeled array

Source

Pandas Series

Pandas Series is the one-dimensional labeled array just like the NumPy Arrays. The difference between these two is that Series is mutable and supports heterogeneous data. So Series is used when you have to create an array with multiple data types.



Source

Creating Pandas Series

```
[2] #Importing Pandas
    import pandas as pd
    #let's first create example Series
    s = pd.Series(["AI", 6, 2.1, False])
    print(s)
```

```
0       AI
1        6
2      2.1
3    False
dtype: object
```

```
[4] #By default, index takes values from 0 to n but you can define your own index values. Here's one ways to define index
    s = pd.Series(["AI", 6, 2.1, False],index=["String","Integer","Float","Boolean"])
    print(s)
```

```
String        AI
Integer        6
Float        2.1
Boolean    False
dtype: object
```

```
#Here's another way to define index
s.index = [1,2,3,4]
print(s)
```

```
1       AI
2        6
3      2.1
4    False
dtype: object
```

Pandas Dataframe

DataFrame is the most commonly used data structure in pandas. DataFrame is a two-dimensional labeled array. It can be thought of as a dictionary of Series structures where both the columns and the rows are indexed, denoted as ‘index’ in the case of rows and ‘columns’ in the case of columns.

To Learn more about pandas see this https://www.w3schools.com/python/pandas/default.asp

Series + Series = Dataframe

SERIES

	Student
0	Student 1
1	Student 2
2	Student 3

+

SERIES

	Age
0	18
1	19
2	20

=

DATAFRAME

	Student	Age
0	Student 1	18
1	Student 2	19
2	Student 3	20

Source

Creating Dataframes

```
days = ["Monday", "Tuesday", "Wednesday", "Thursday", "Friday", "Saturday", "Sunday"]
df = pd.DataFrame(days)
print(df)
```

```
           0
0     Monday
1    Tuesday
2  Wednesday
3   Thursday
4     Friday
5   Saturday
6     Sunday
```

```
[12] #several types of data can be used to create dataframe: Dictionary of 1D ndarrays, lists, dictionaries, or Series structures.
     data = {"Staff":["Staff1", "Staff2", "Staff3"],"Age":[31,38,26]}
     df = pd.DataFrame(data)
     print(df)
```

```
    Staff  Age
0  Staff1   31
1  Staff2   38
2  Staff3   26
```

Creating Dataframes

```
[9] df.index = ["row1","row2","row3"]
    print(df)
```

```
       Staff  Age
row1  Staff1   31
row2  Staff2   38
row3  Staff3   26
```

```
[10] df.columns = ["Name of Staff","Age of Staff"]
     print(df)
```

```
     Name of Staff  Age of Staff
row1        Staff1            31
row2        Staff2            38
row3        Staff3            26
```

Data analysis process

Source

Hands-on Pandas Series and Dataframe Examples

It’s time to Switch to

Jupyter Notebook

Source

Link to Jupyter Notebook

Pandas Notebook

Thank YOU!

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