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Data Science With Python

DATA AND
ARTIFICIAL INTELLIGENCE

Data Manipulation with Pandas

Learning Objectives

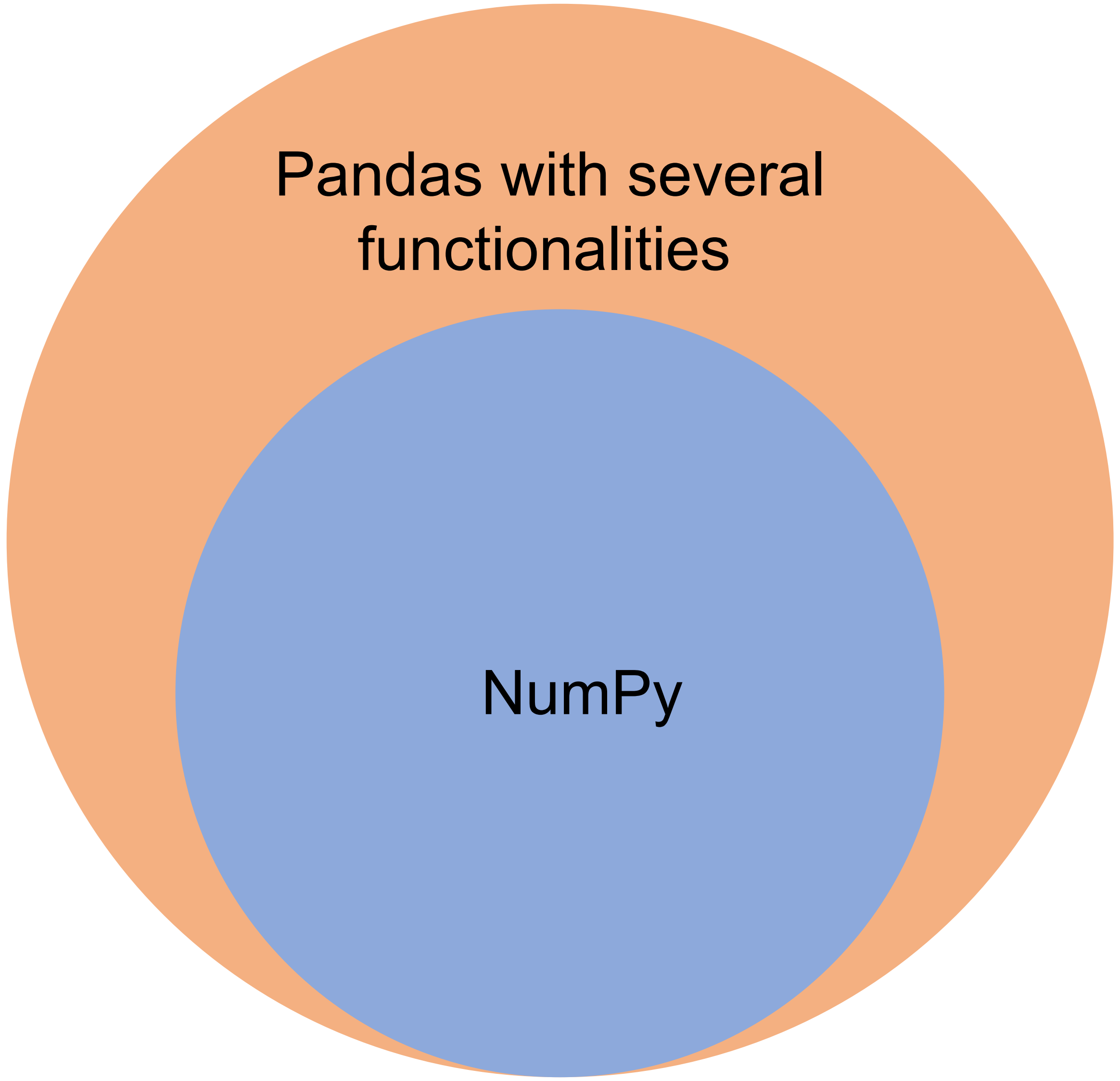
By the end of this lesson, you will be able to:

- Explain Pandas and its features
- List different data structures of Pandas
- Outline the process to create series and DataFrame with data inputs
- Explain how to view, select, and access elements in a data structure
- Describe the procedure to handle vectorized operations
- Illustrate how to handle missing values
- Analyze data with different data operation methods

Introduction to Pandas

Why Pandas

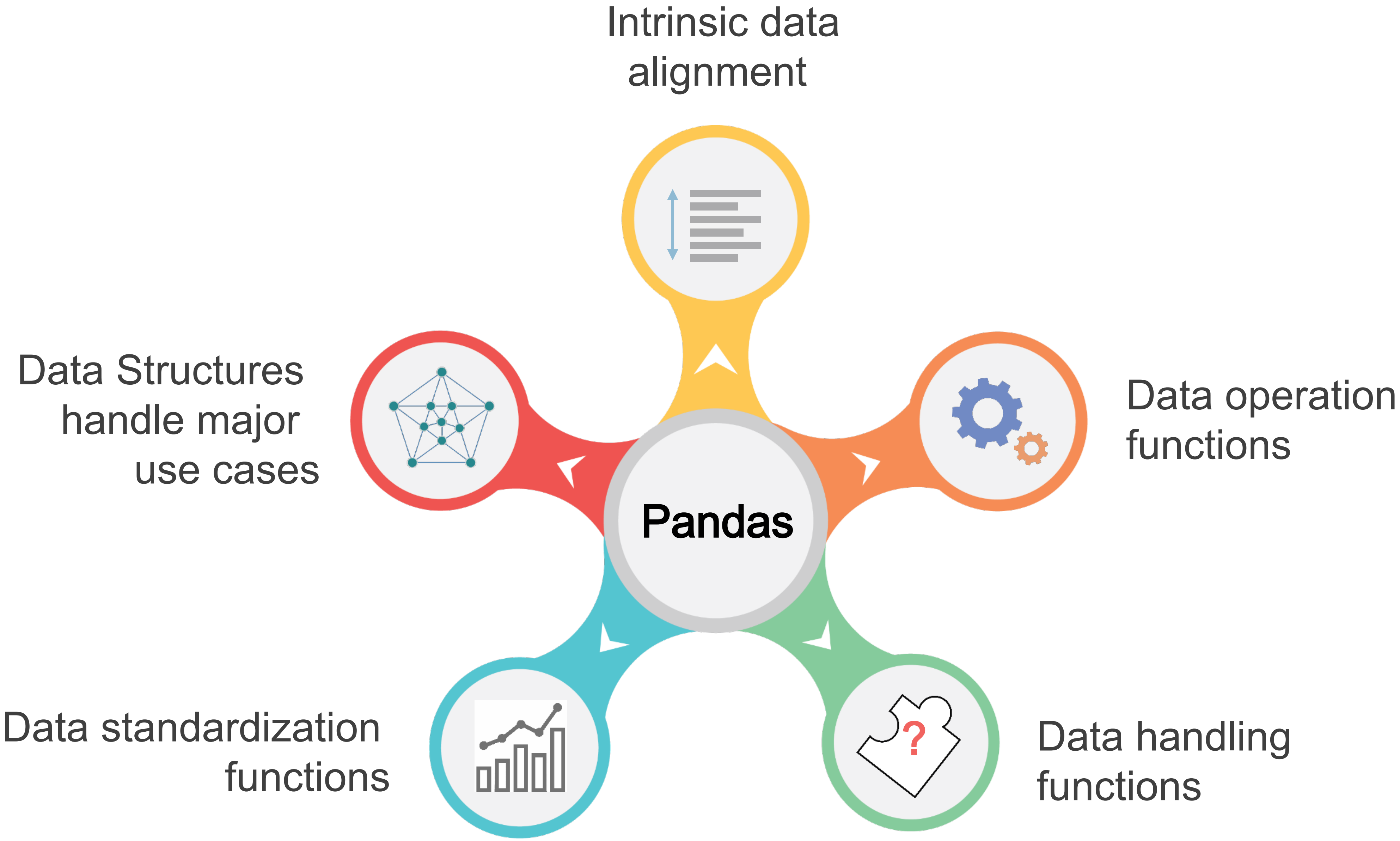
NumPy is great for mathematical computing, but why do we need Pandas?



Pandas with several functionalities

NumPy

Why Pandas



Intrinsic data alignment

Data Structures handle major use cases

Data operation functions

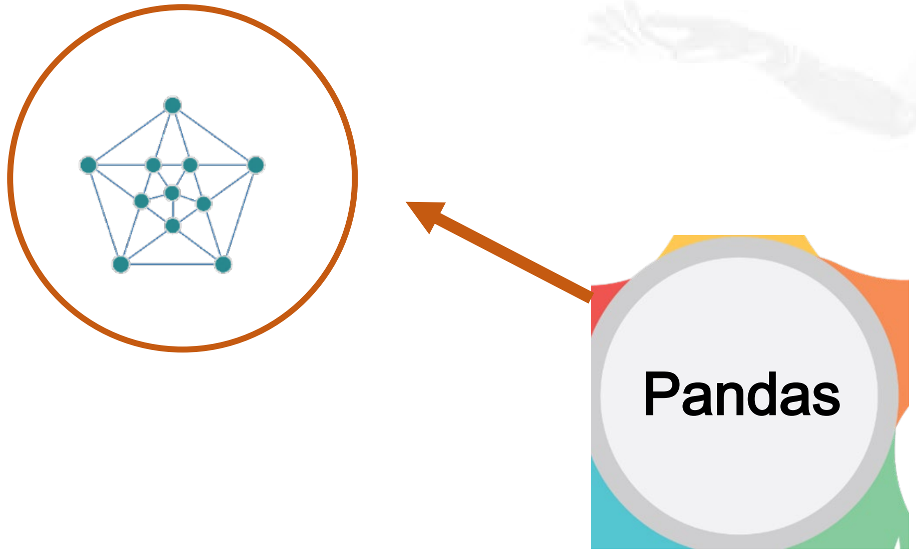
Pandas

Data standardization functions

Data handling functions

Why Pandas

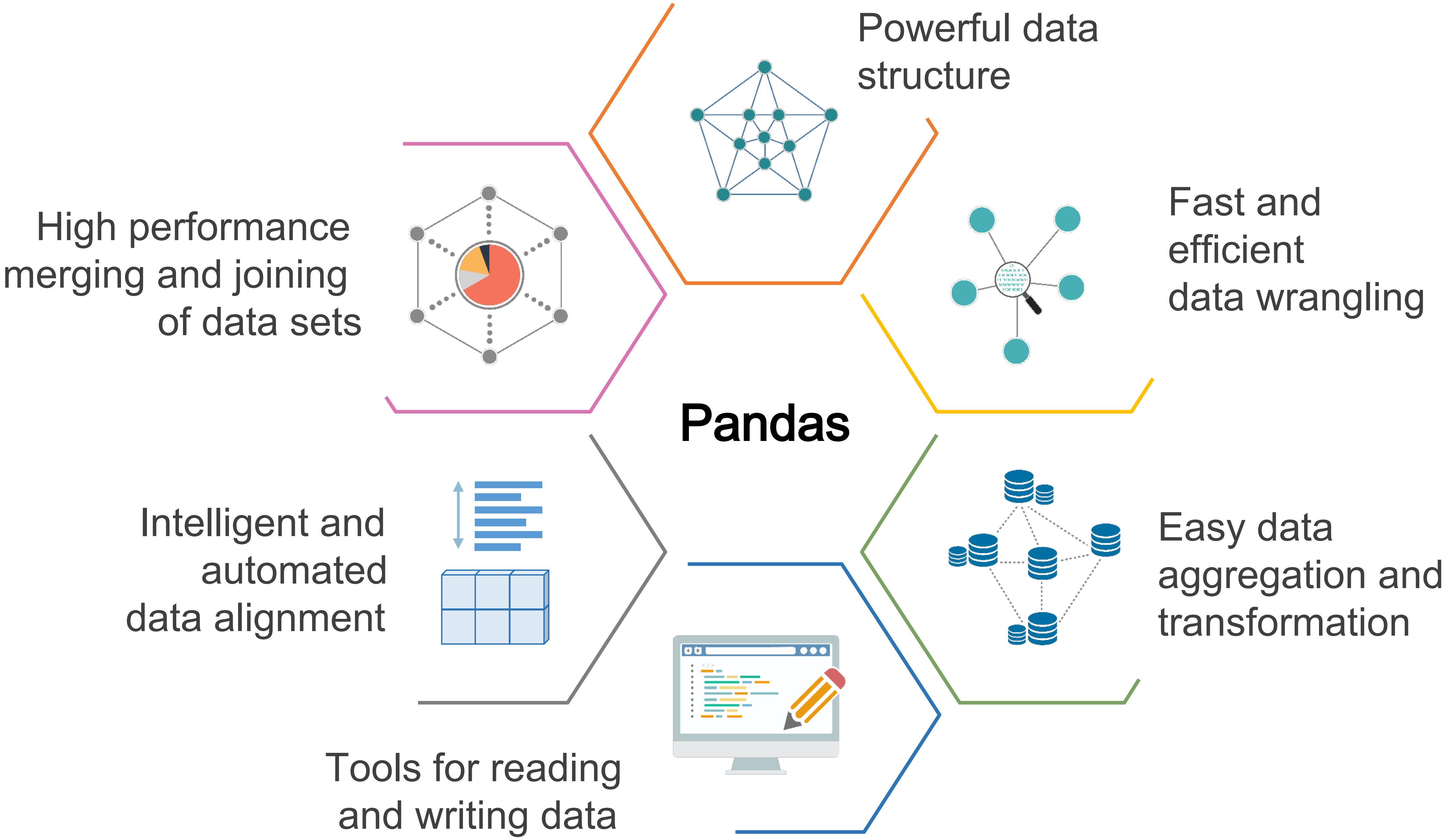
Data structures handling major use cases



Pandas

Features of Pandas

The various features of Pandas make it an efficient library for Data Scientists.



Pandas

Powerful data structure

Fast and efficient data wrangling

Easy data aggregation and transformation

Tools for reading and writing data

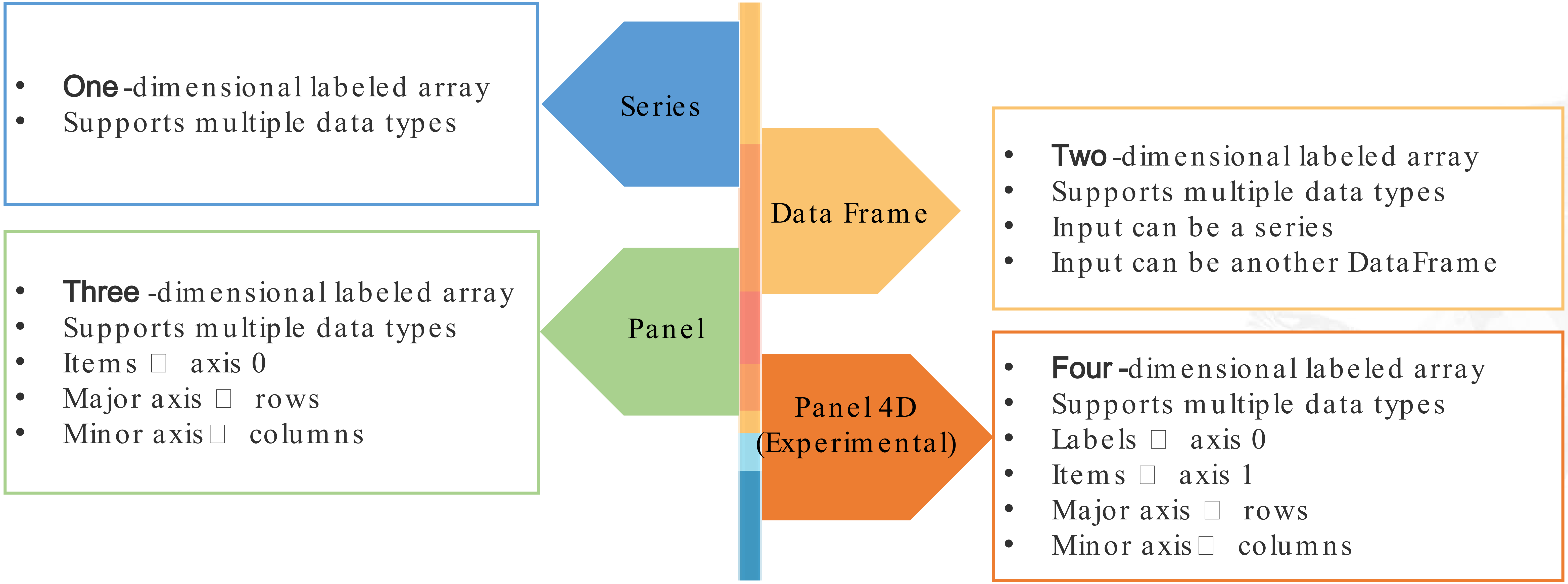
Intelligent and automated data alignment

High performance merging and joining of data sets

Data Structures

Data Structures

The four main libraries of Pandas data structure are:



Series

- **One** -dimensional labeled array
- Supports multiple data types

Data Frame

- **Two** -dimensional labeled array
- Supports multiple data types
- Input can be a series
- Input can be another DataFrame

Panel

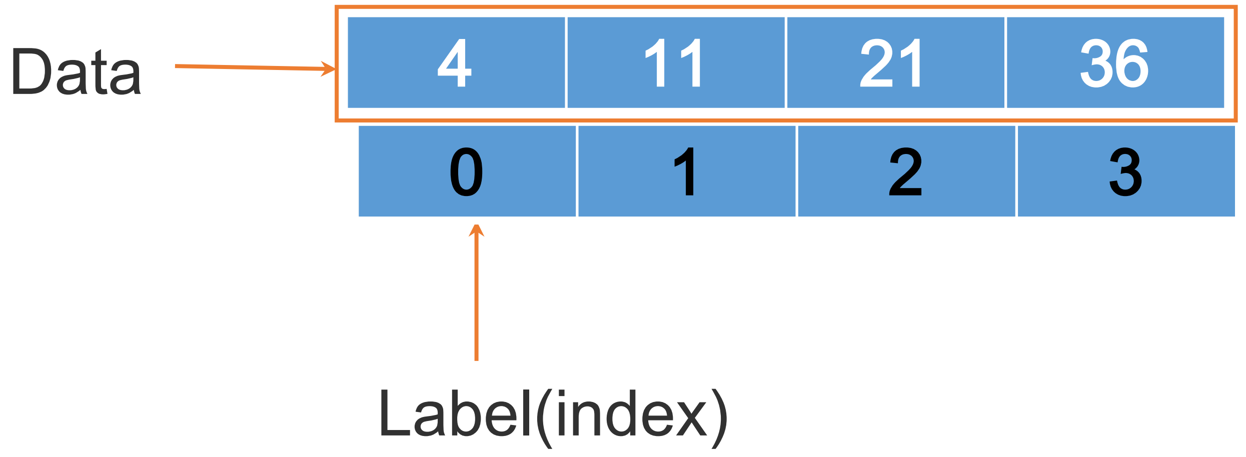
- **Three** -dimensional labeled array
- Supports multiple data types
- Items □ axis 0
- Major axis □ rows
- Minor axis □ columns

Panel 4D (Experimental)

- **Four** -dimensional labeled array
- Supports multiple data types
- Labels □ axis 0
- Items □ axis 1
- Major axis □ rows
- Minor axis □ columns

Understanding Series

Series is a one-dimensional array -like object containing data and labels (or index).



Data

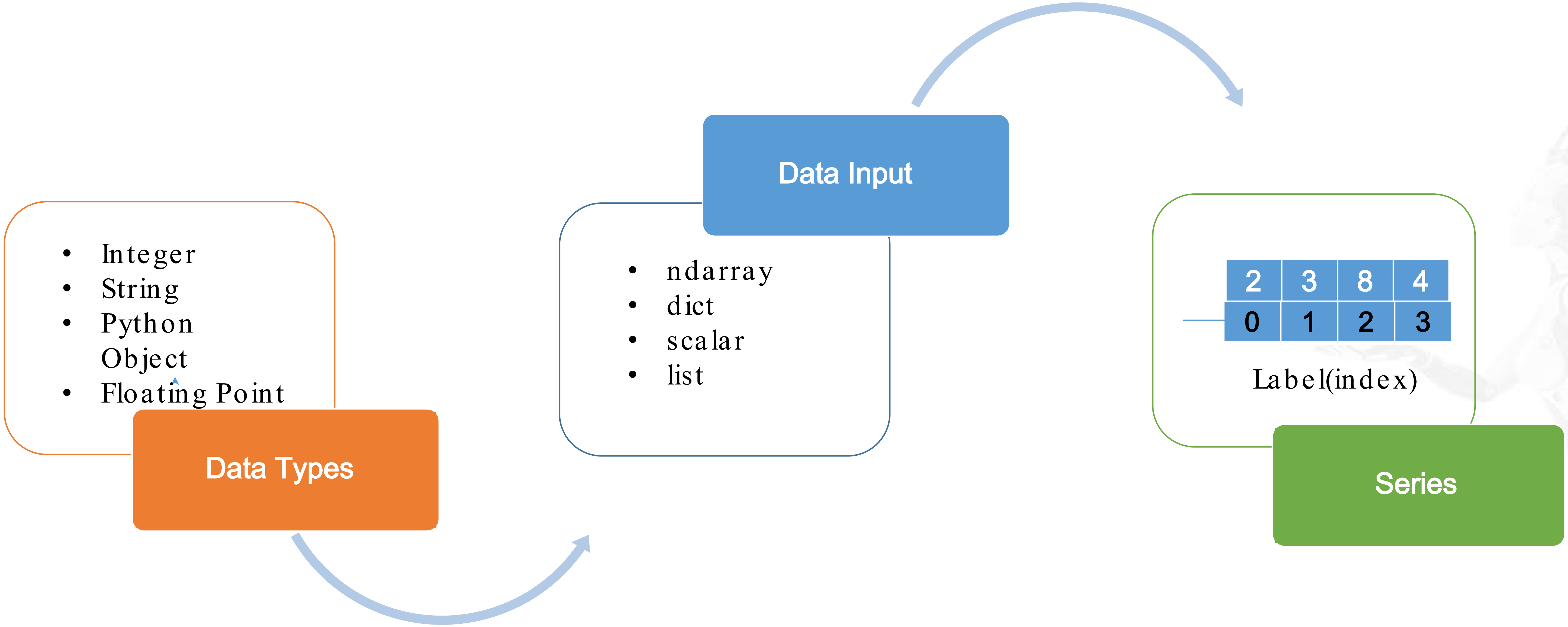
4	11	21	36
0	1	2	3

Label(index)

Data alignment is intrinsic and will not be broken until changed explicitly by program.

Series

Series can be created with different data inputs:



- Integer
- String
- Python Object
- Floating Point

Data Types

Data Input

- ndarray
- dict
- scalar
- list

2	3	8	4
0	1	2	3

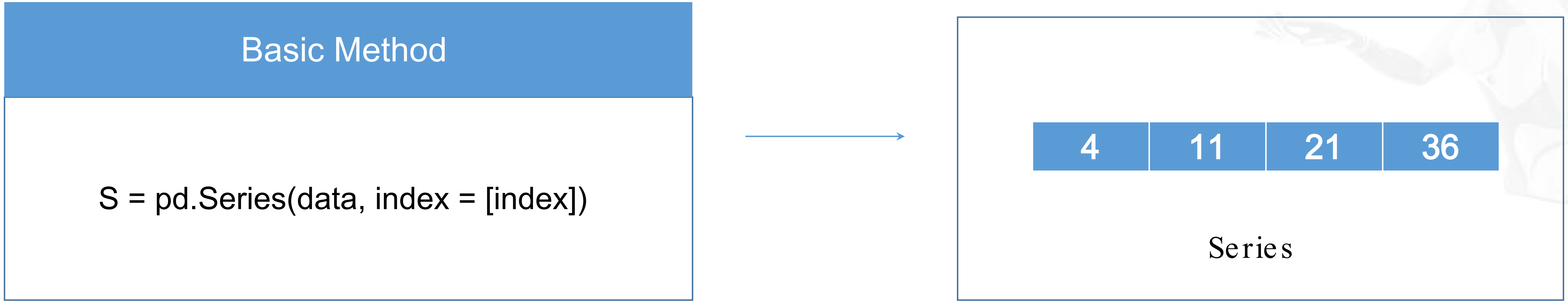
Label(index)

Series

How to Create Series?

Key points to note while creating a series are:

- Import Pandas as it is the main library (Import pandas as pd)
- Import NumPy while working with ndarrays (Import numpy as np)
- Apply the syntax and pass the data elements as arguments



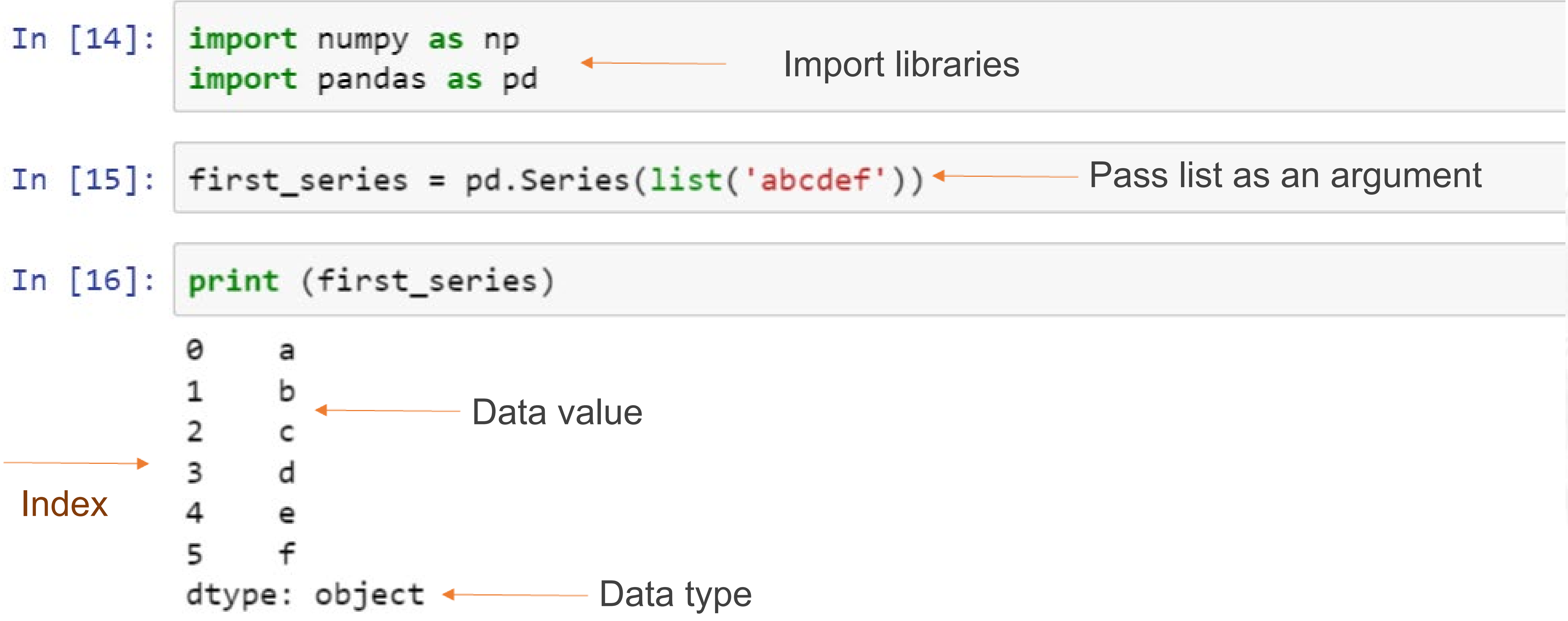
Basic Method

```
S = pd.Series(data, index = [index])
```

4	11	21	36

Series

Creating Series from a List



```
In [14]: import numpy as np
         import pandas as pd
```

Import libraries

```
In [15]: first_series = pd.Series(list('abcdef'))
```

Pass list as an argument

```
In [16]: print (first_series)

0    a
1    b
2    c
3    d
4    e
5    f
dtype: object
```

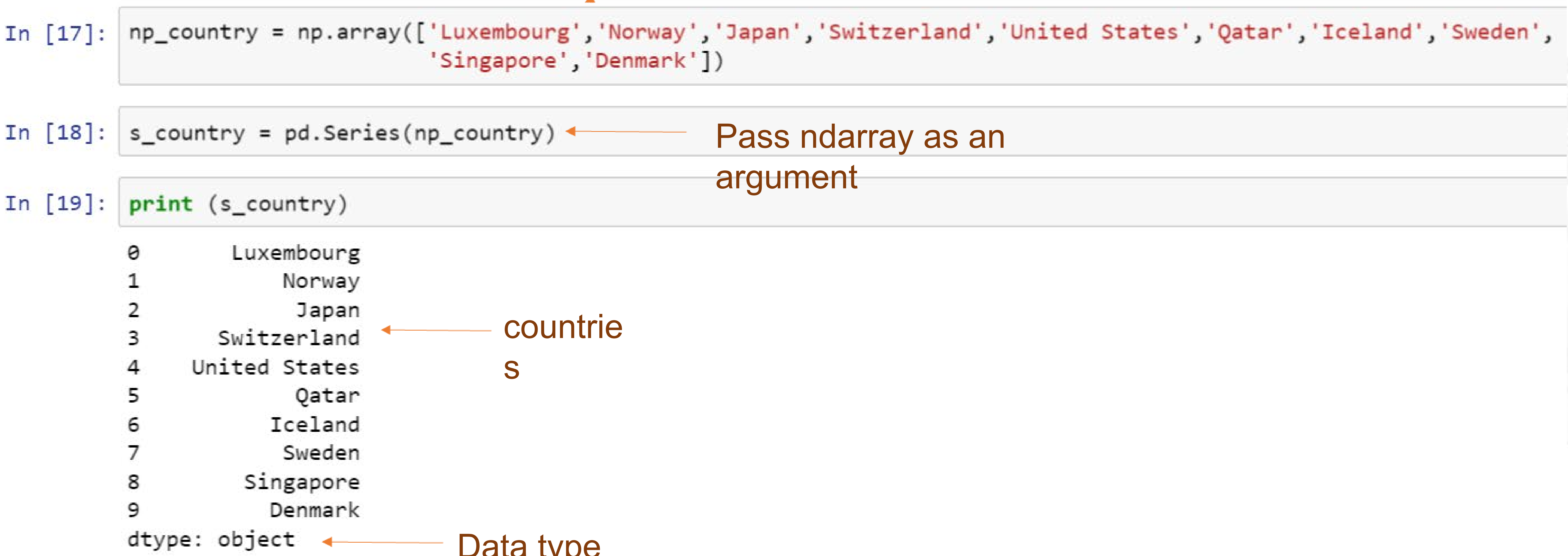
Data value

Index

Data type

We have not created index for data but notice that data alignment is done automatically.

Creating Series from an ndarray



ndarray for countries

```
In [17]: np_country = np.array(['Luxembourg','Norway','Japan','Switzerland','United States','Qatar','Iceland','Sweden',
                               'Singapore','Denmark'])
```

```
In [18]: s_country = pd.Series(np_country)
```

Pass ndarray as an argument

```
In [19]: print (s_country)
```

```
0       Luxembourg
1           Norway
2            Japan
3      Switzerland
4    United States
5            Qatar
6          Iceland
7           Sweden
8        Singapore
9          Denmark
dtype: object
```

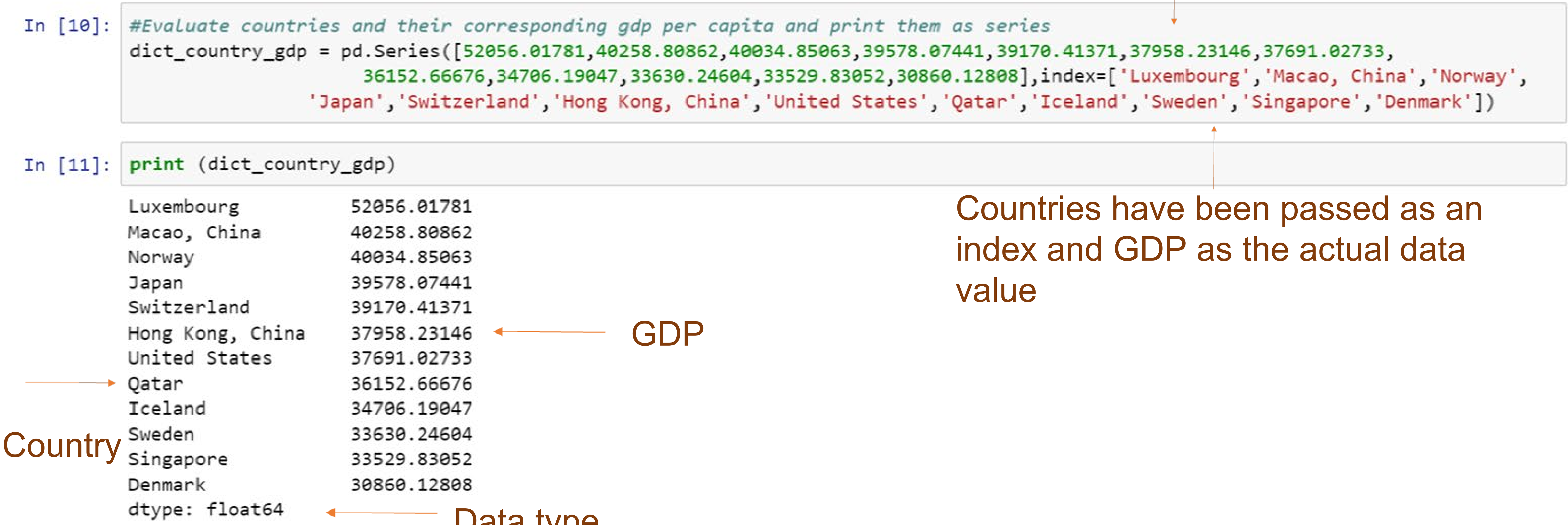
countrie
s

Data type

Creating Series from dict

A series can also be created with dict data input for faster operations.

dict for countries and their gdp



```
In [10]: #Evaluate countries and their corresponding gdp per capita and print them as series
         dict_country_gdp = pd.Series([52056.01781,40258.80862,40034.85063,39578.07441,39170.41371,37958.23146,37691.02733,
                                       36152.66676,34706.19047,33630.24604,33529.83052,30860.12808],index=['Luxembourg','Macao, China','Norway',
                                  'Japan','Switzerland','Hong Kong, China','United States','Qatar','Iceland','Sweden','Singapore','Denmark'])
```

```
In [11]: print (dict_country_gdp)
```

```
Luxembourg          52056.01781
Macao, China        40258.80862
Norway              40034.85063
Japan               39578.07441
Switzerland         39170.41371
Hong Kong, China    37958.23146
United States       37691.02733
Qatar               36152.66676
Iceland             34706.19047
Sweden              33630.24604
Singapore           33529.83052
Denmark             30860.12808
dtype: float64
```

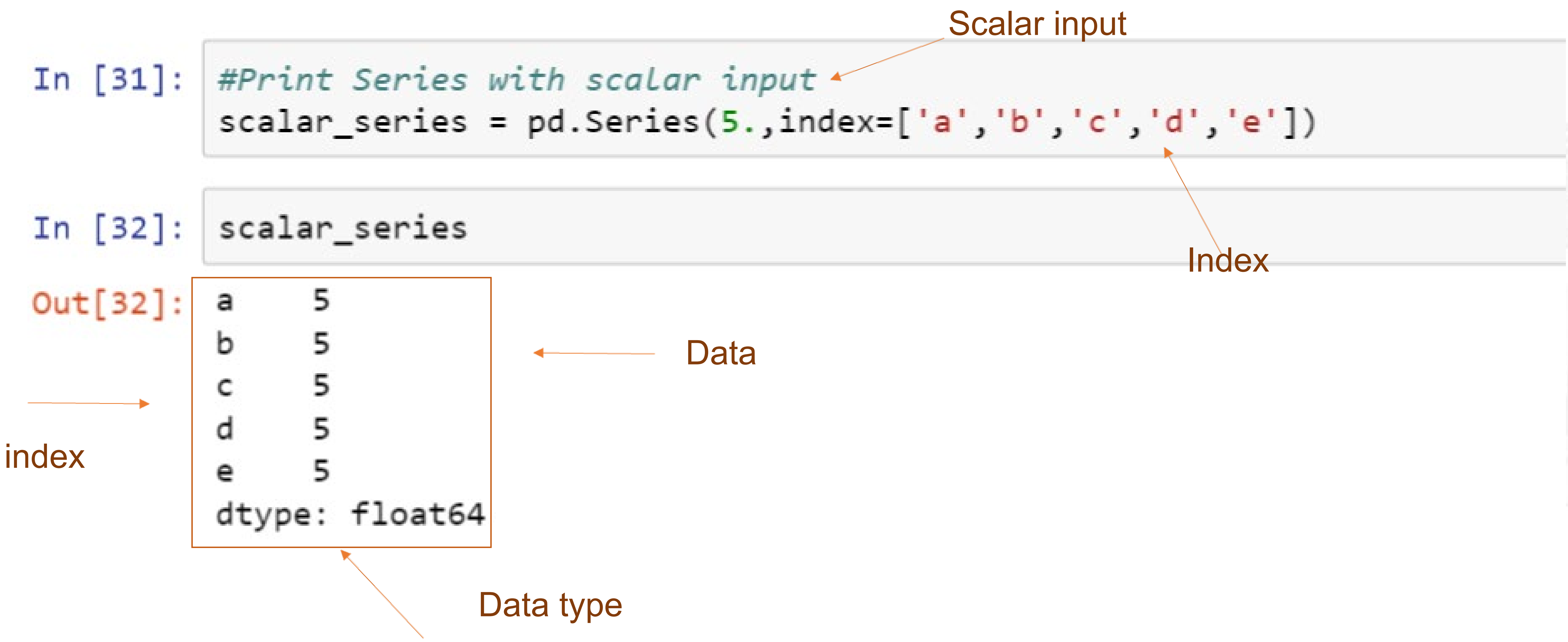
Countries have been passed as an index and GDP as the actual data value

GDP

Country

Data type

Creating Series from Scalar



```
In [31]: #Print Series with scalar input
         scalar_series = pd.Series(5.,index=['a','b','c','d','e'])

In [32]: scalar_series

Out[32]: a    5
         b    5
         c    5
         d    5
         e    5
         dtype: float64
```

Scalar input

Index

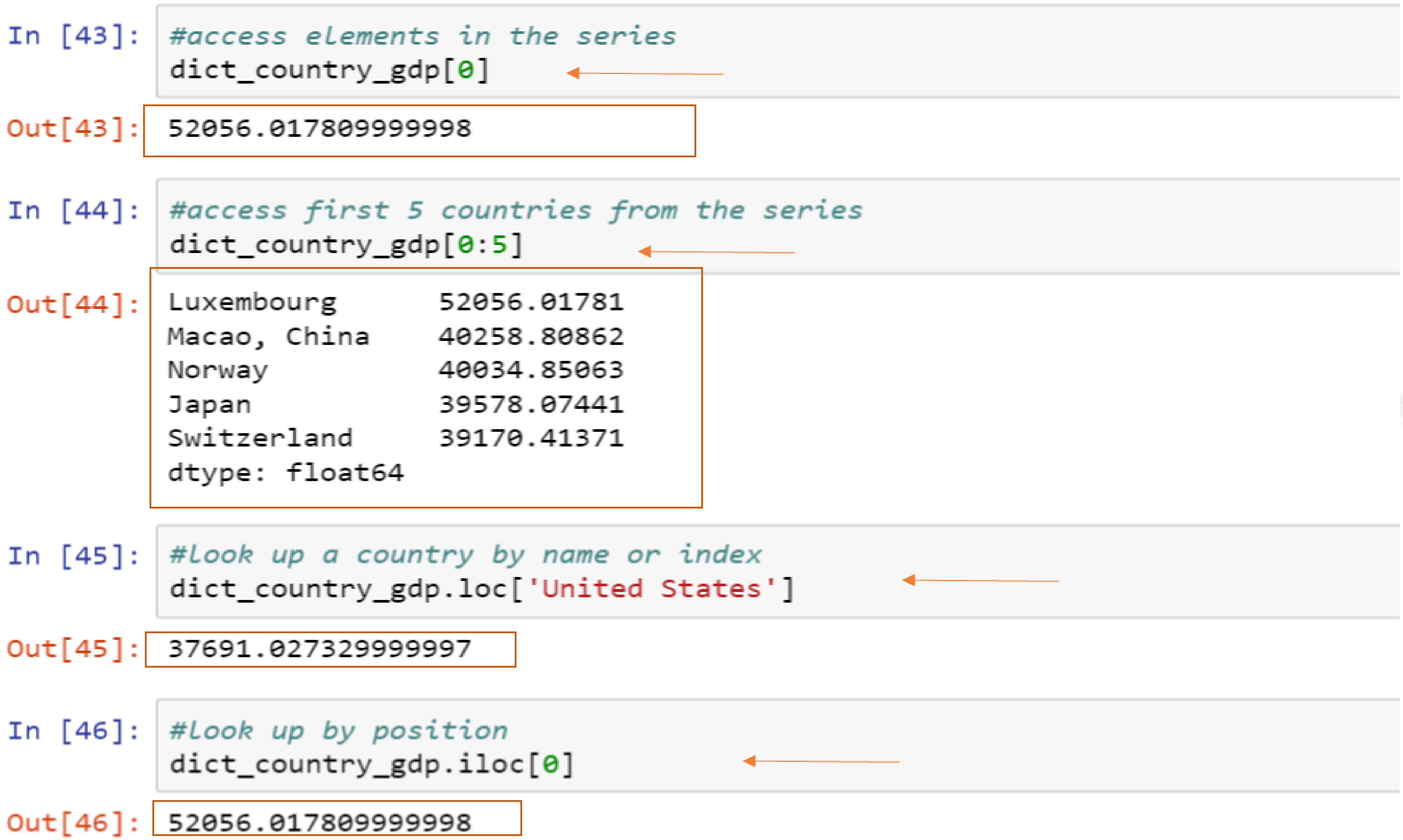
Data

index

Data type

Accessing Elements in Series

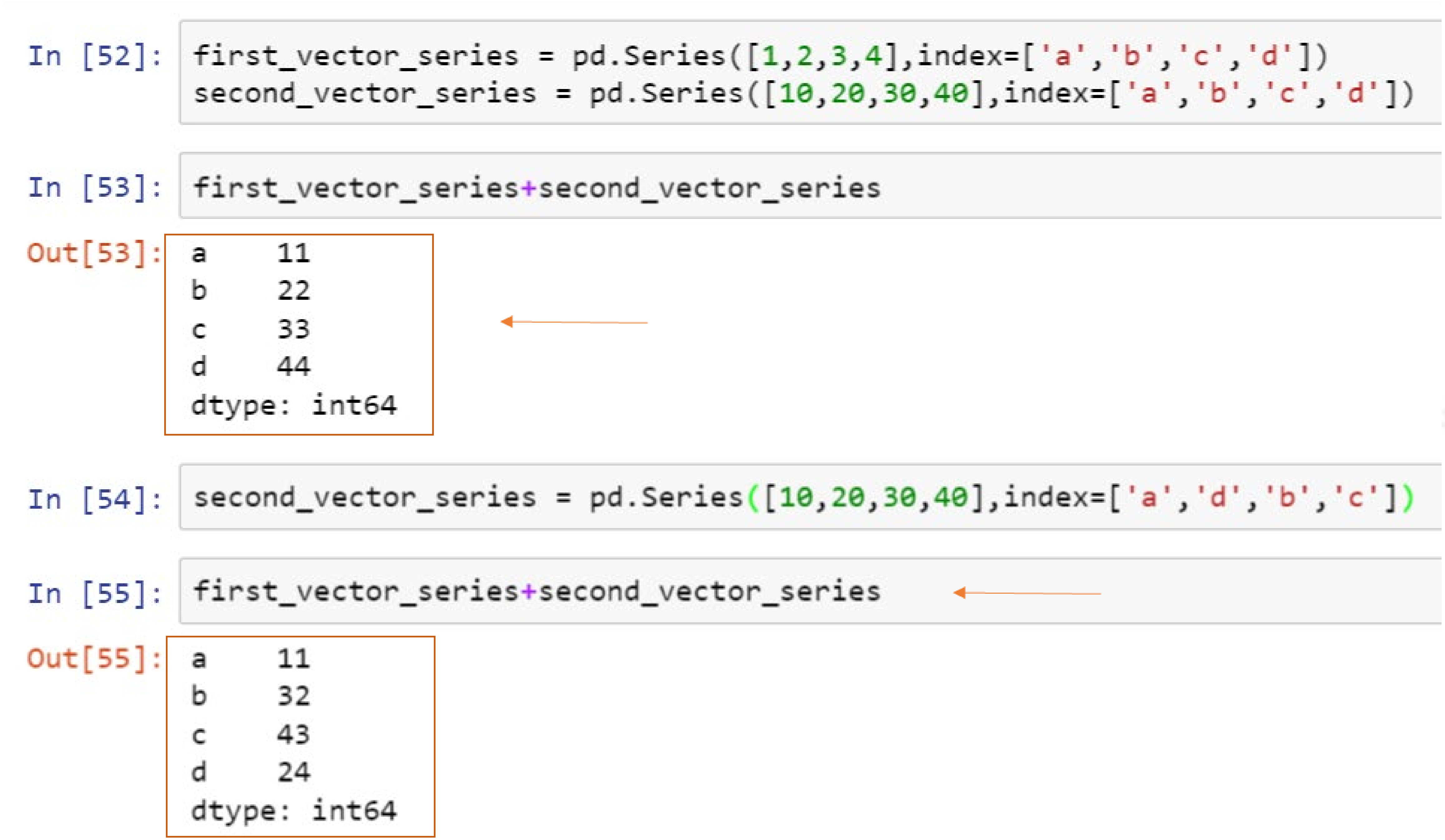
Data can be accessed through different functions like loc, iloc by passing data element position or index range.



```
In [43]: #access elements in the series
         dict_country_gdp[0]

Out[43]: 52056.017809999998

In [44]: #access first 5 countries from the series
         dict_country_gdp[0:5]

Out[44]: Luxembourg       52056.01781
         Macao, China     40258.80862
         Norway           40034.85063
         Japan            39578.07441
         Switzerland      39170.41371
         dtype: float64

In [45]: #look up a country by name or index
         dict_country_gdp.loc['United States']

Out[45]: 37691.027329999997

In [46]: #look up by position
         dict_country_gdp.iloc[0]

Out[46]: 52056.017809999998
```

Vectorizing Operations in Series

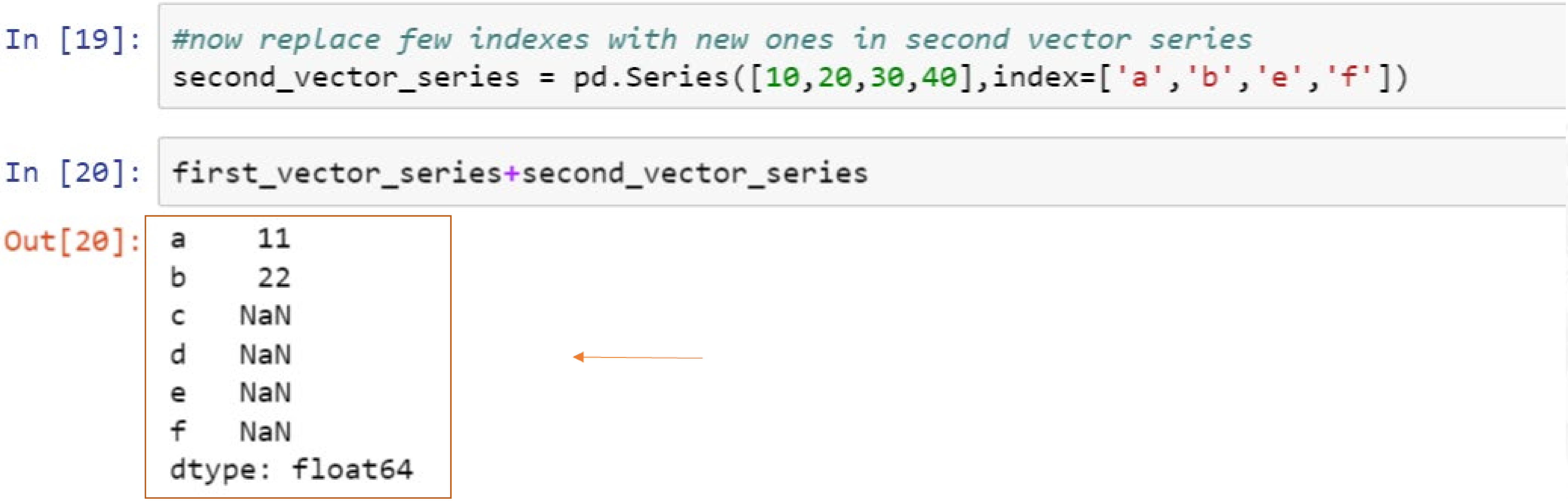
Vectorized operations are performed by the data element’s position.



```
In [52]: first_vector_series = pd.Series([1,2,3,4],index=['a','b','c','d'])
         second_vector_series = pd.Series([10,20,30,40],index=['a','b','c','d'])

In [53]: first_vector_series+second_vector_series

Out[53]: a     11
         b     22
         c     33
         d     44
         dtype: int64

In [54]: second_vector_series = pd.Series([10,20,30,40],index=['a','d','b','c'])

In [55]: first_vector_series+second_vector_series

Out[55]: a     11
         b     32
         c     43
         d     24
         dtype: int64
```

Add the series

Vectorizing Operations in Series



```
In [19]: #now replace few indexes with new ones in second vector series
         second_vector_series = pd.Series([10,20,30,40],index=['a','b','e','f'])
```

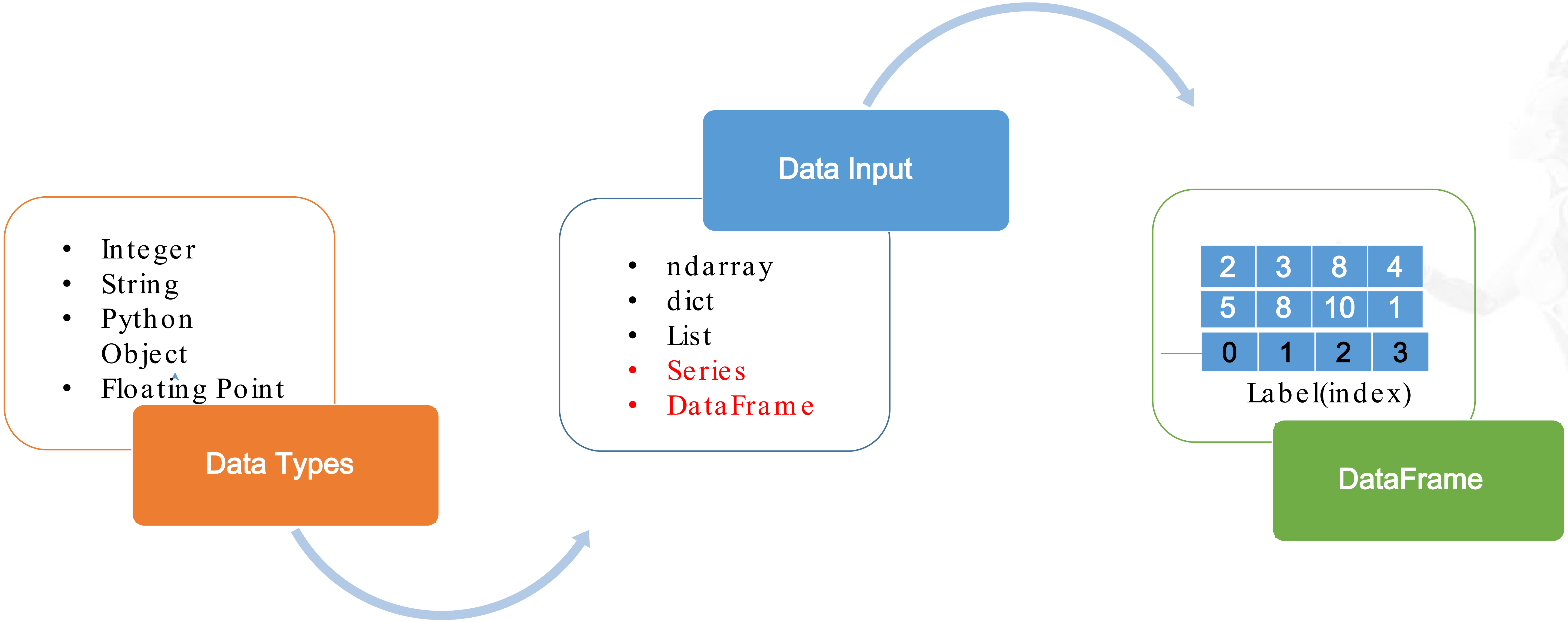
```
In [20]: first_vector_series+second_vector_series
```

```
Out[20]: a    11
         b    22
         c   NaN
         d   NaN
         e   NaN
         f   NaN
         dtype: float64
```

DataFrames

DataFrame

DataFrame is a two-dimensional labeled data structure with columns of potentially different types.



Data Types

- Integer
- String
- Python Object
- Floating Point

Data Input

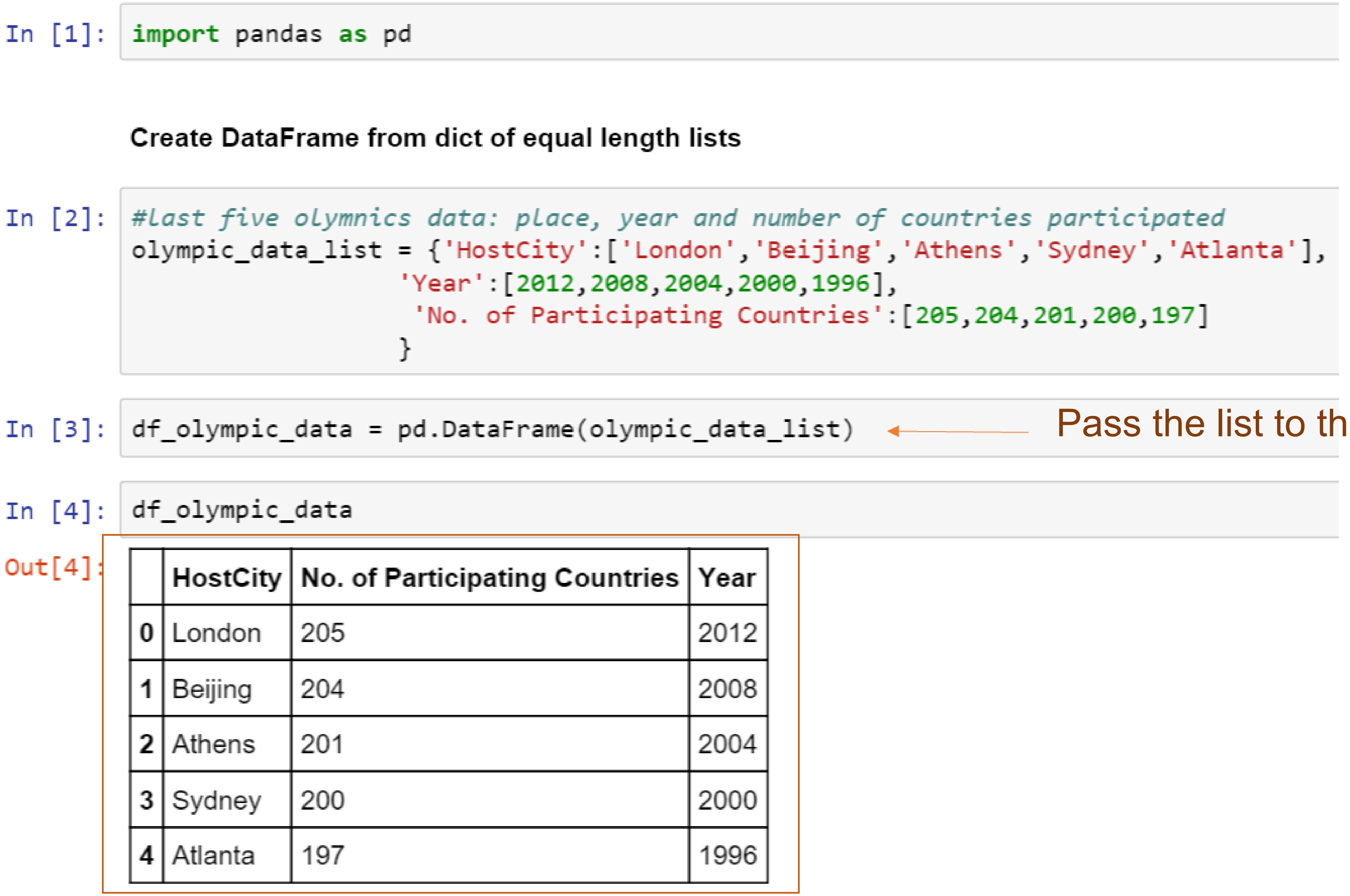
- ndarray
- dict
- List
- Series
- DataFrame

DataFrame

2	3	8	4
5	8	10	1
0	1	2	3

Label(index)

Creating DataFrame from Lists



```
In [1]: import pandas as pd
```

Create DataFrame from dict of equal length lists

```
In [2]: #last five olymnics data: place, year and number of countries participated
        olympic_data_list = {'HostCity':['London','Beijing','Athens','Sydney','Atlanta'],
                             'Year':[2012,2008,2004,2000,1996],
                              'No. of Participating Countries':[205,204,201,200,197]
                             }
```

```
In [3]: df_olympic_data = pd.DataFrame(olympic_data_list)
```

Pass the list to the DataFrame

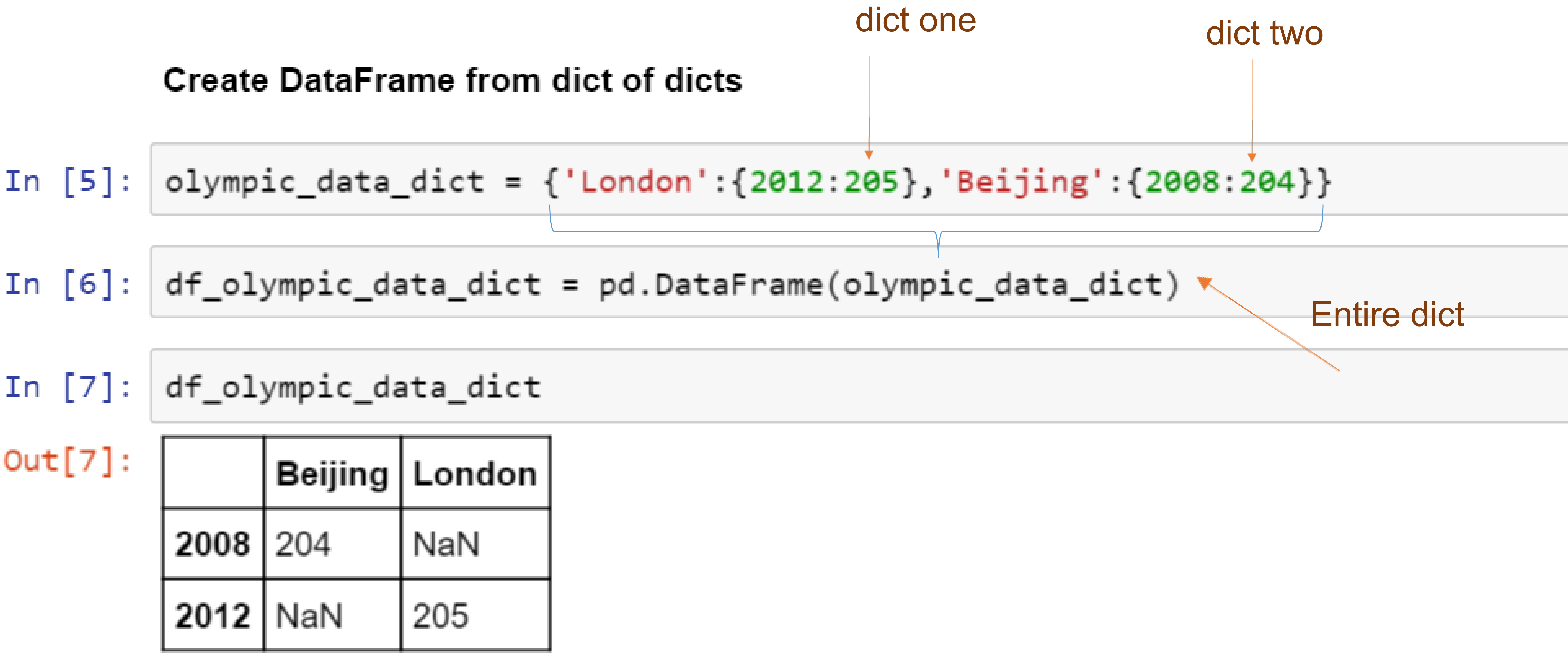
```
In [4]: df_olympic_data
```

Out[4]:

	HostCity	No. of Participating Countries	Year
0	London	205	2012
1	Beijing	204	2008
2	Athens	201	2004
3	Sydney	200	2000
4	Atlanta	197	1996

Creating DataFrame from dict

This example shows you how to create a DataFrame from a series of dicts.



dict one

dict two

Entire dict

Create DataFrame from dict of dicts

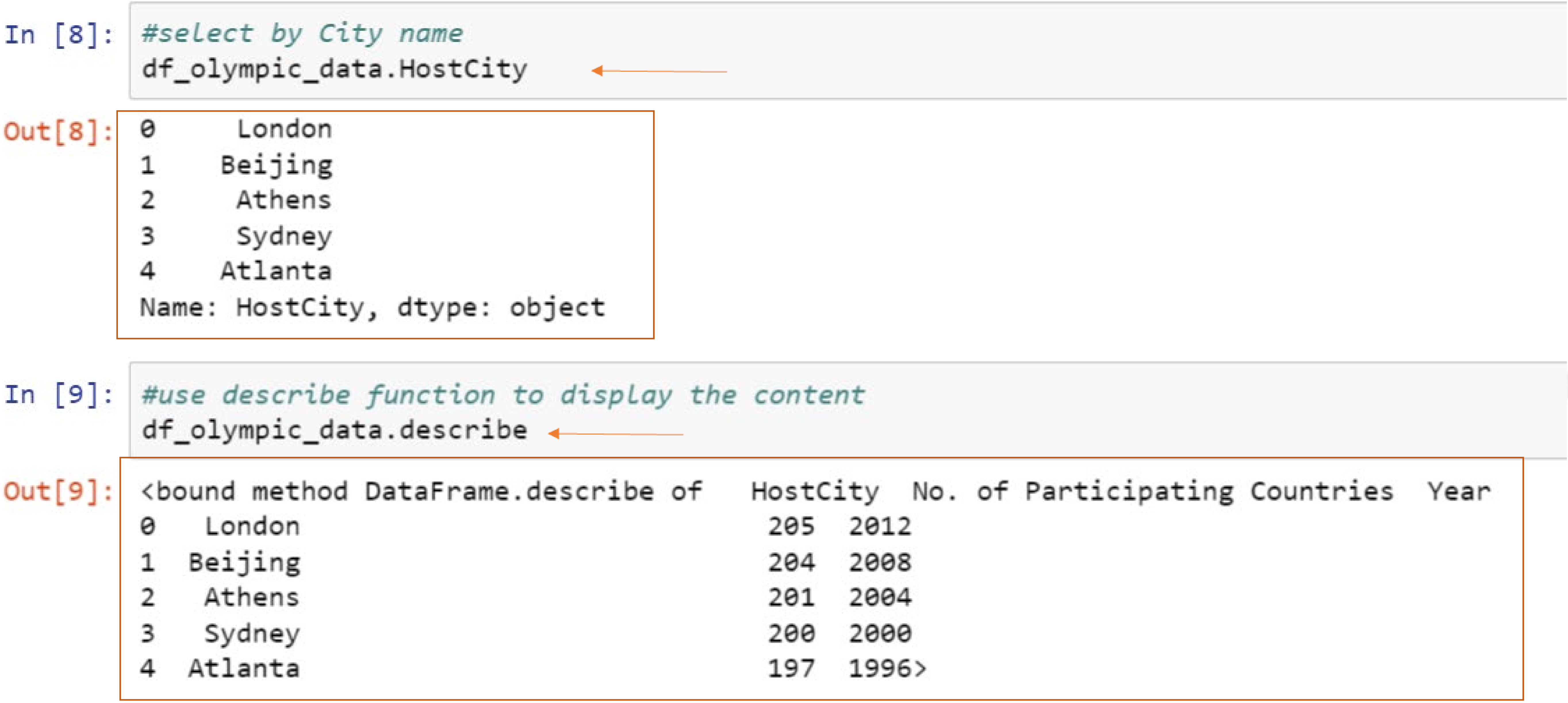
```
In [5]: olympic_data_dict = {'London':{2012:205},'Beijing':{2008:204}}

In [6]: df_olympic_data_dict = pd.DataFrame(olympic_data_dict)

In [7]: df_olympic_data_dict
```

Out[7]:

	Beijing	London
2008	204	NaN
2012	NaN	205

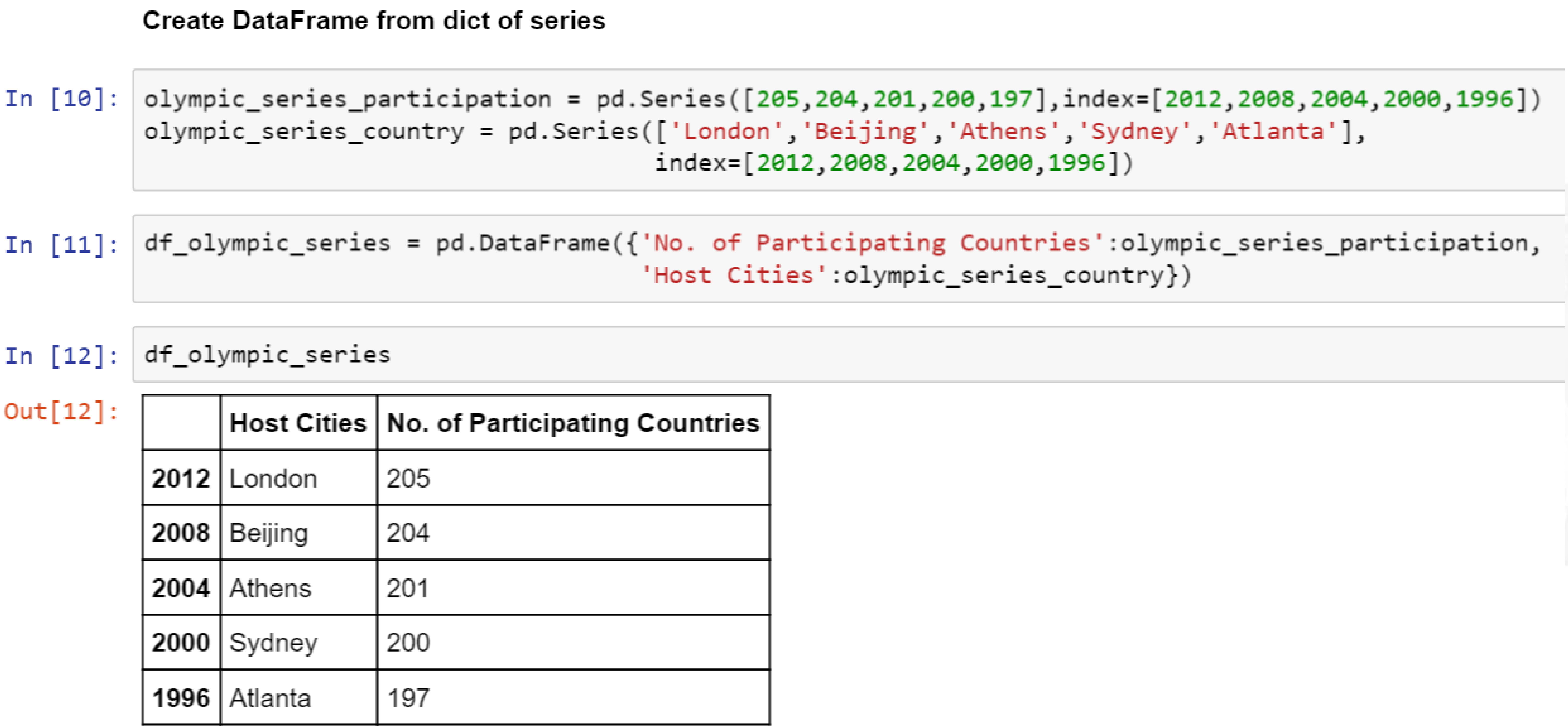
Viewing DataFrame

You can view a DataFrame by referring to the column name or with the describe function.



```
In [8]: #select by City name
        df_olympic_data.HostCity

Out[8]: 0      London
        1     Beijing
        2      Athens
        3      Sydney
        4     Atlanta
        Name: HostCity, dtype: object

In [9]: #use describe function to display the content
        df_olympic_data.describe

Out[9]: <bound method DataFrame.describe of   HostCity  No. of Participating Countries  Year
        0   London                             205  2012
        1  Beijing                             204  2008
        2   Athens                             201  2004
        3   Sydney                             200  2000
        4  Atlanta                             197  1996>
```

Creating DataFrame from dict of Series



Create DataFrame from dict of series

```
In [10]: olympic_series_participation = pd.Series([205,204,201,200,197],index=[2012,2008,2004,2000,1996])
         olympic_series_country = pd.Series(['London','Beijing','Athens','Sydney','Atlanta'],
                                            index=[2012,2008,2004,2000,1996])
```

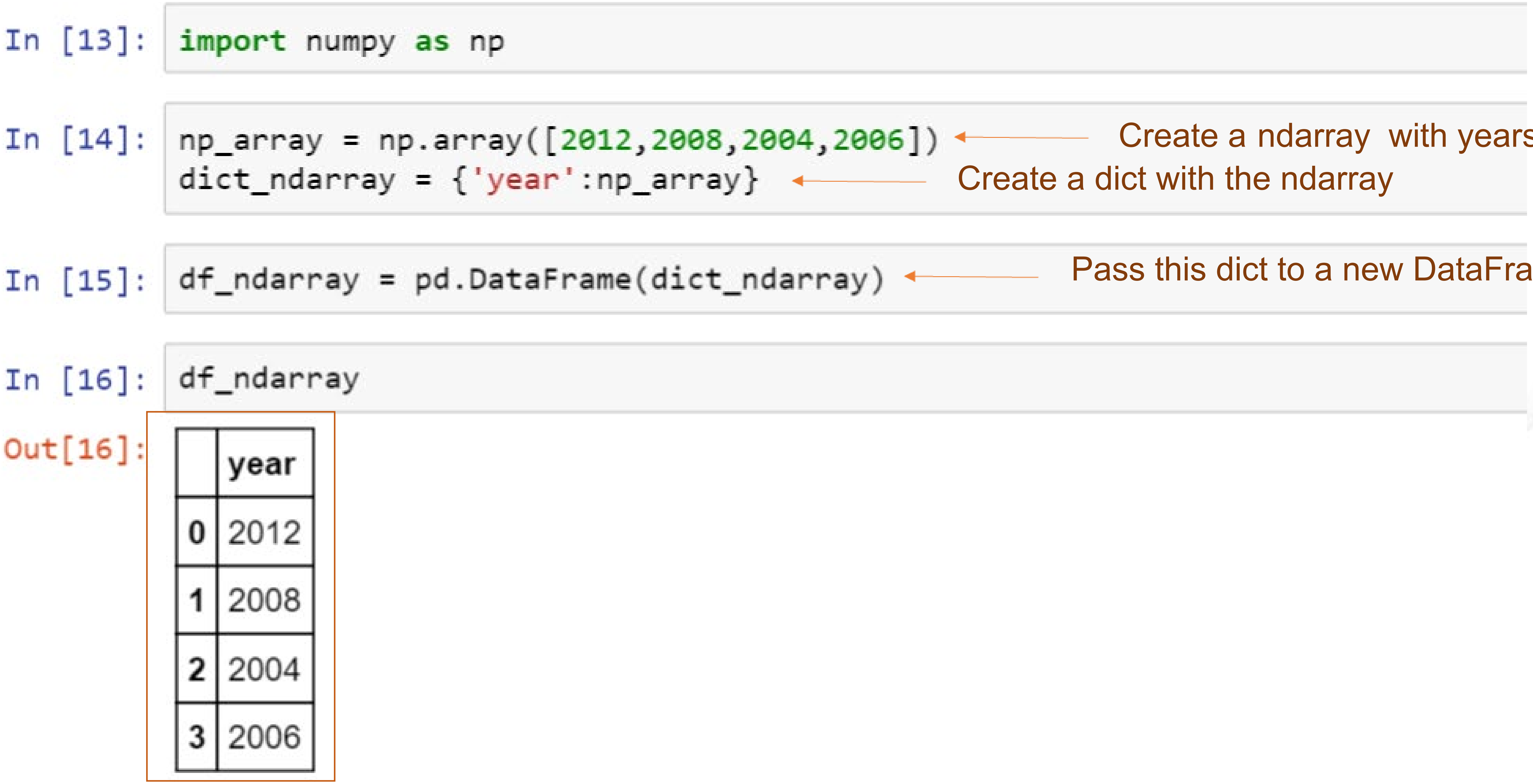
```
In [11]: df_olympic_series = pd.DataFrame({'No. of Participating Countries':olympic_series_participation,
                                           'Host Cities':olympic_series_country})
```

```
In [12]: df_olympic_series
```

Out[12]:

	Host Cities	No. of Participating Countries
2012	London	205
2008	Beijing	204
2004	Athens	201
2000	Sydney	200
1996	Atlanta	197

Creating DataFrame from ndarray



Create DataFrame from dict of ndarray

```
In [13]: import numpy as np
```

```
In [14]: np_array = np.array([2012,2008,2004,2006])
         dict_ndarray = {'year':np_array}
```

Create a ndarray with years

Create a dict with the ndarray

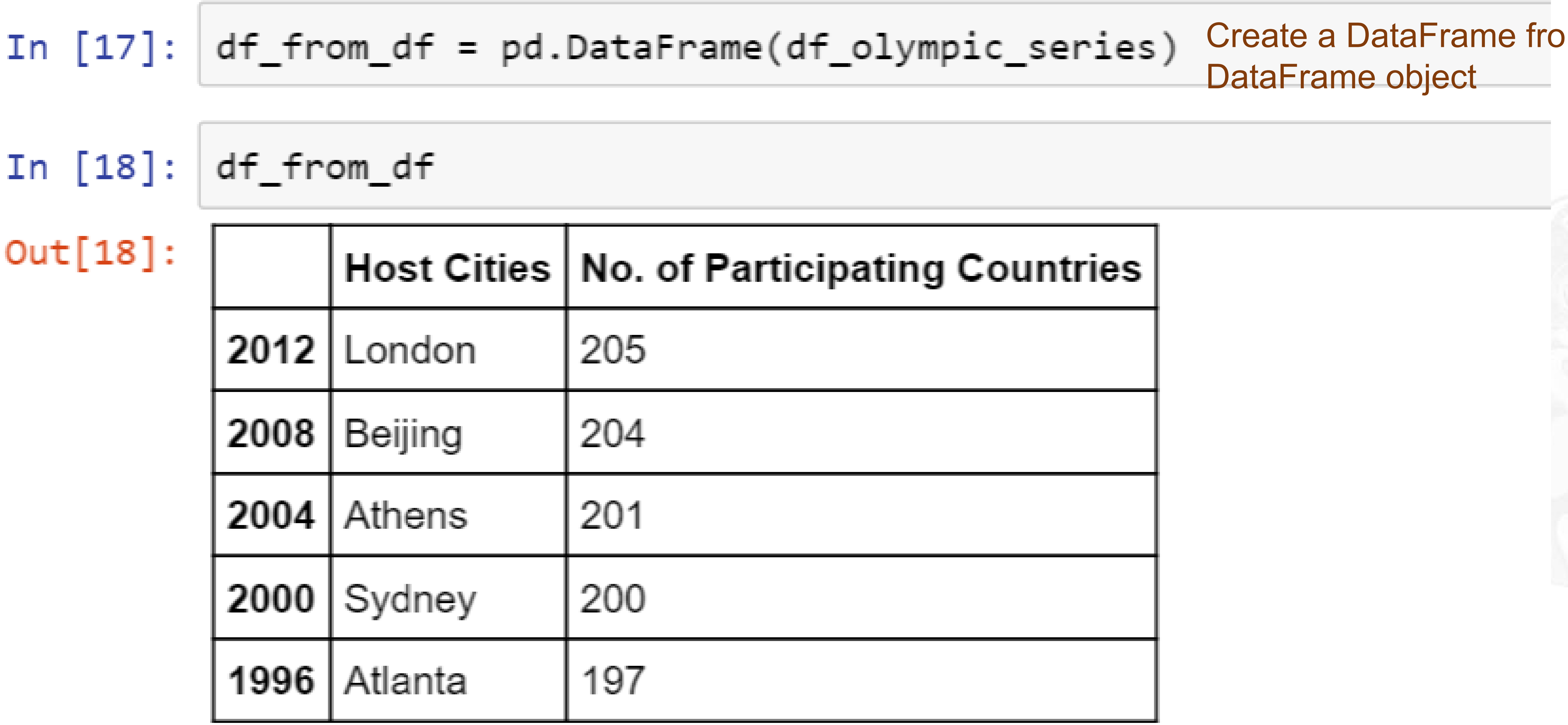
```
In [15]: df_ndarray = pd.DataFrame(dict_ndarray)
```

Pass this dict to a new DataFrame

```
In [16]: df_ndarray
```

```
Out[16]:
     year
  0  2012
  1  2008
  2  2004
  3  2006
```

Creating DataFrame from DataFrame Object



```
In [17]: df_from_df = pd.DataFrame(df_olympic_series)
```

Create a DataFrame from a DataFrame object

```
In [18]: df_from_df
```

Out[18]:

	Host Cities	No. of Participating Countries
2012	London	205
2008	Beijing	204
2004	Athens	201
2000	Sydney	200
1996	Atlanta	197

View and Select Data

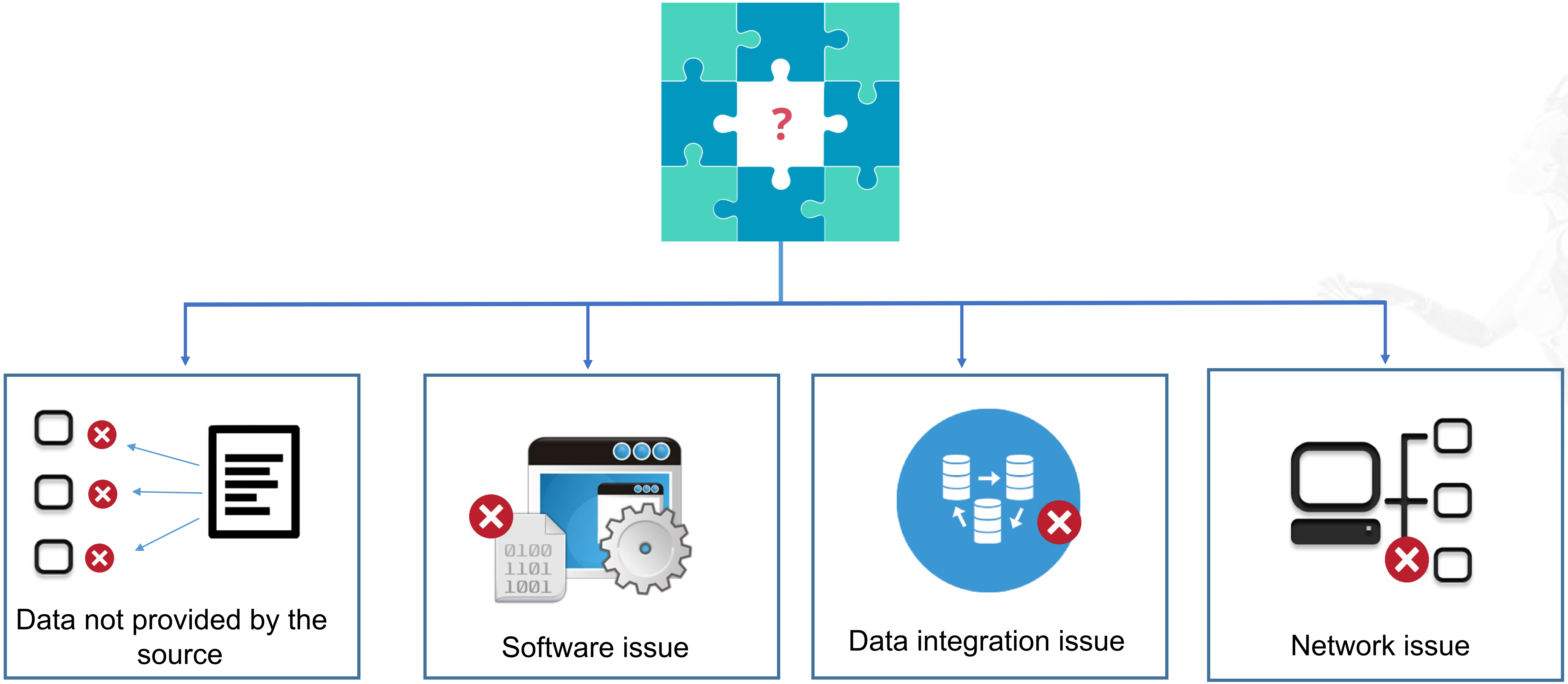
Problem Statement: Demonstrate how to view and select data in a DataFrame

Access: Click on the **Practice Labs** tab on the left side panel of the LMS. Copy or note the username and password that is generated. Click on the **Launch Lab** button. On the page that appears, enter the username and password in the respective fields, and click **Login** .

Missing Values

Missing Values

Various factors may lead to missing data values:



Data not provided by the source

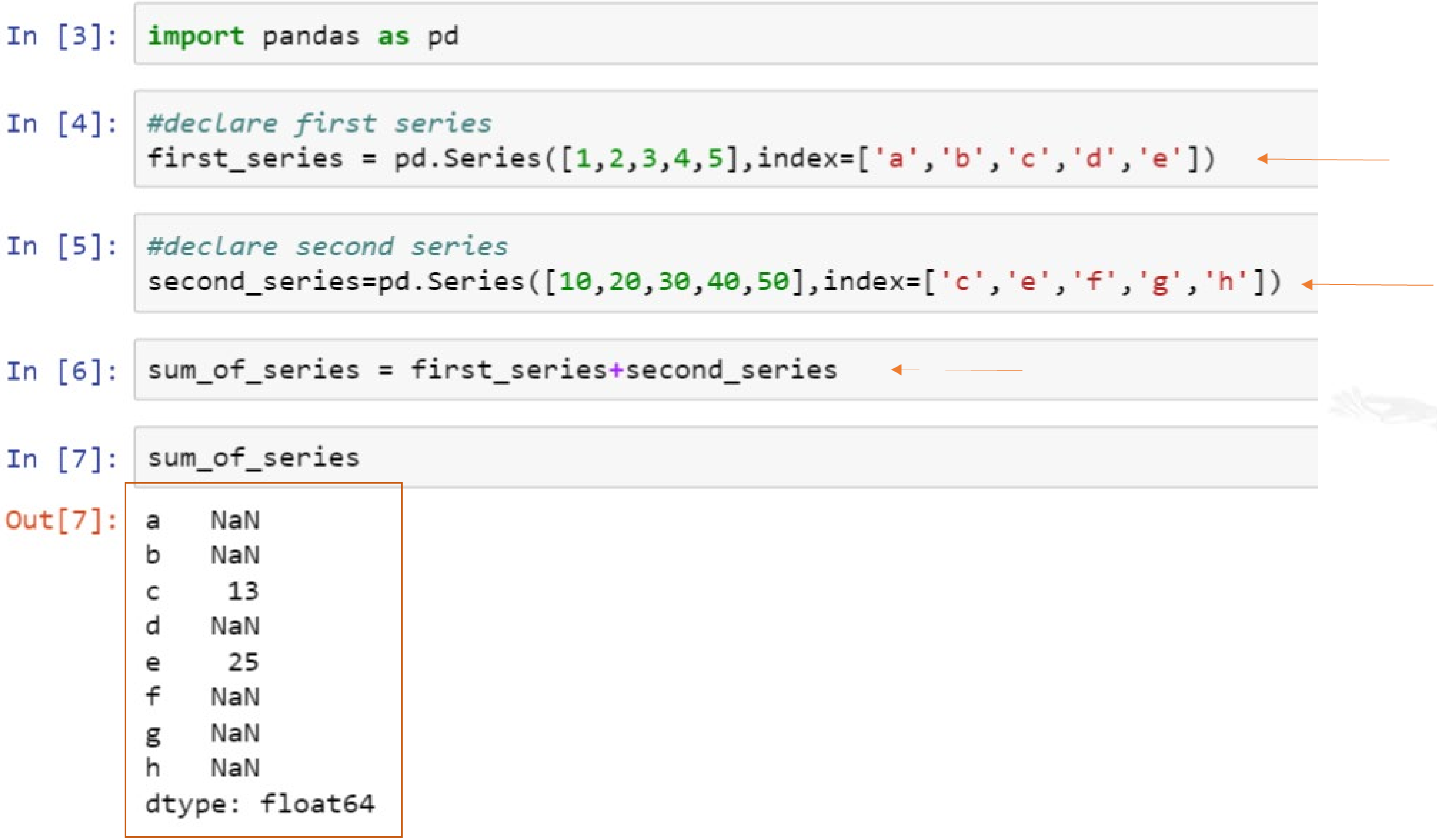
Software issue

Data integration issue

Network issue

Handling Missing Values

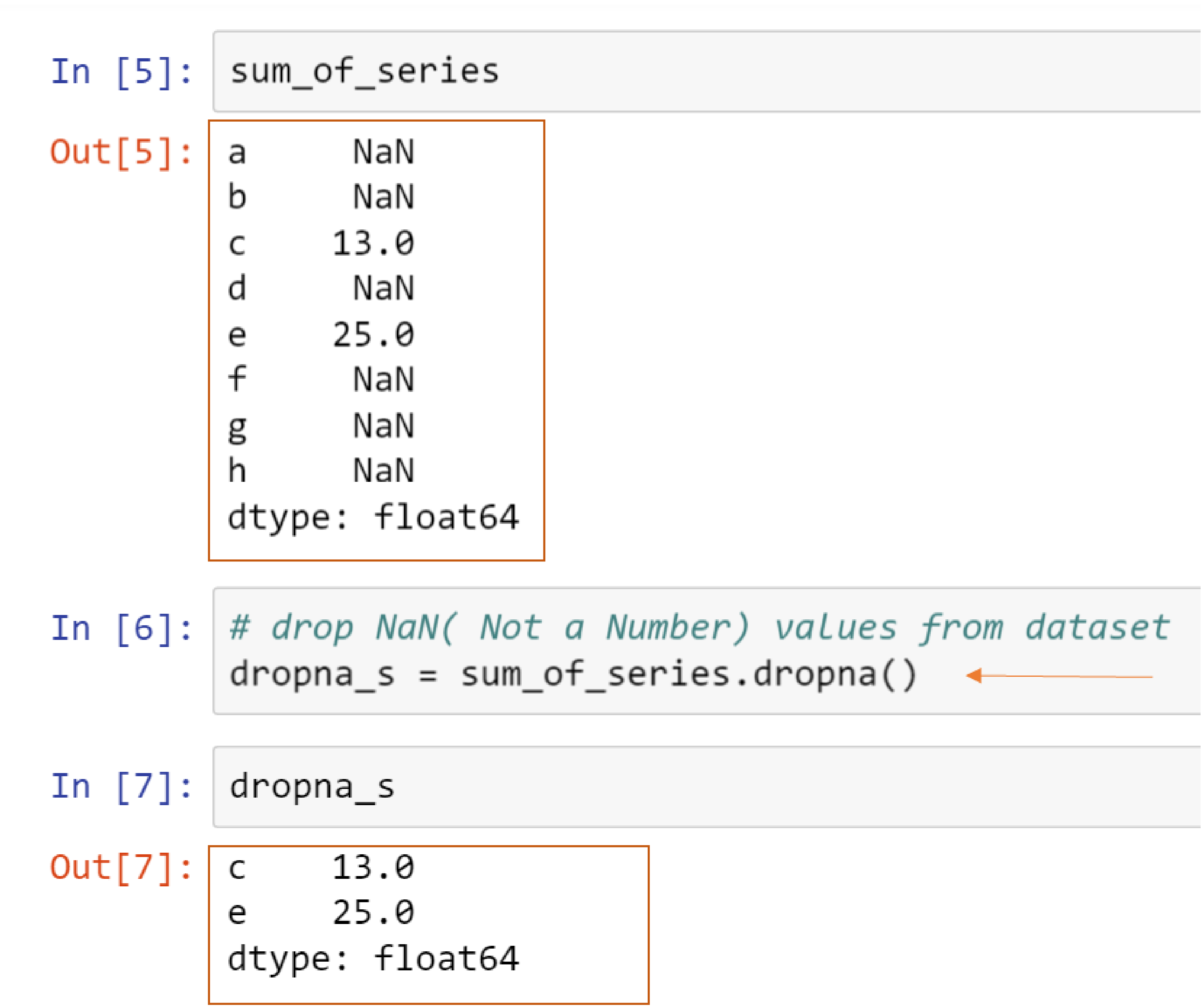
It’s difficult to operate a dataset when it has missing values or uncommon indices.



```
In [3]: import pandas as pd

In [4]: #declare first series
        first_series = pd.Series([1,2,3,4,5],index=['a','b','c','d','e'])

In [5]: #declare second series
        second_series=pd.Series([10,20,30,40,50],index=['c','e','f','g','h'])

In [6]: sum_of_series = first_series+second_series

In [7]: sum_of_series

Out[7]: a    NaN
        b    NaN
        c     13
        d    NaN
        e     25
        f    NaN
        g    NaN
        h    NaN
        dtype: float64
```

Handling Missing Values with Functions

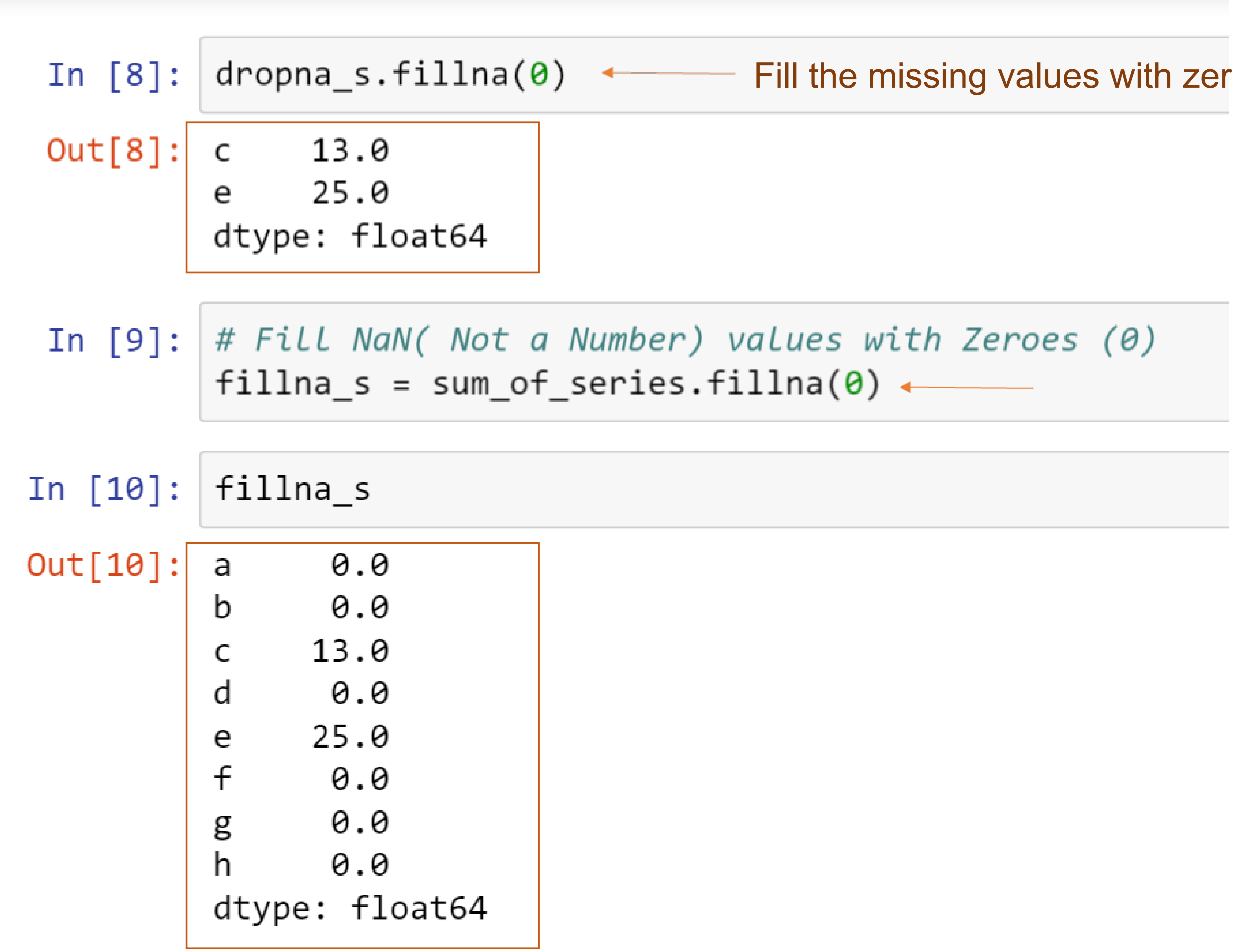
The dropna function drops all the values with uncommon indices.



```
In [5]:  sum_of_series

Out[5]:  a      NaN
         b      NaN
         c     13.0
         d      NaN
         e     25.0
         f      NaN
         g      NaN
         h      NaN
         dtype: float64

In [6]:  # drop NaN( Not a Number) values from dataset
         dropna_s = sum_of_series.dropna()

In [7]:  dropna_s

Out[7]:  c     13.0
         e     25.0
         dtype: float64
```

Handling Missing Values with Functions

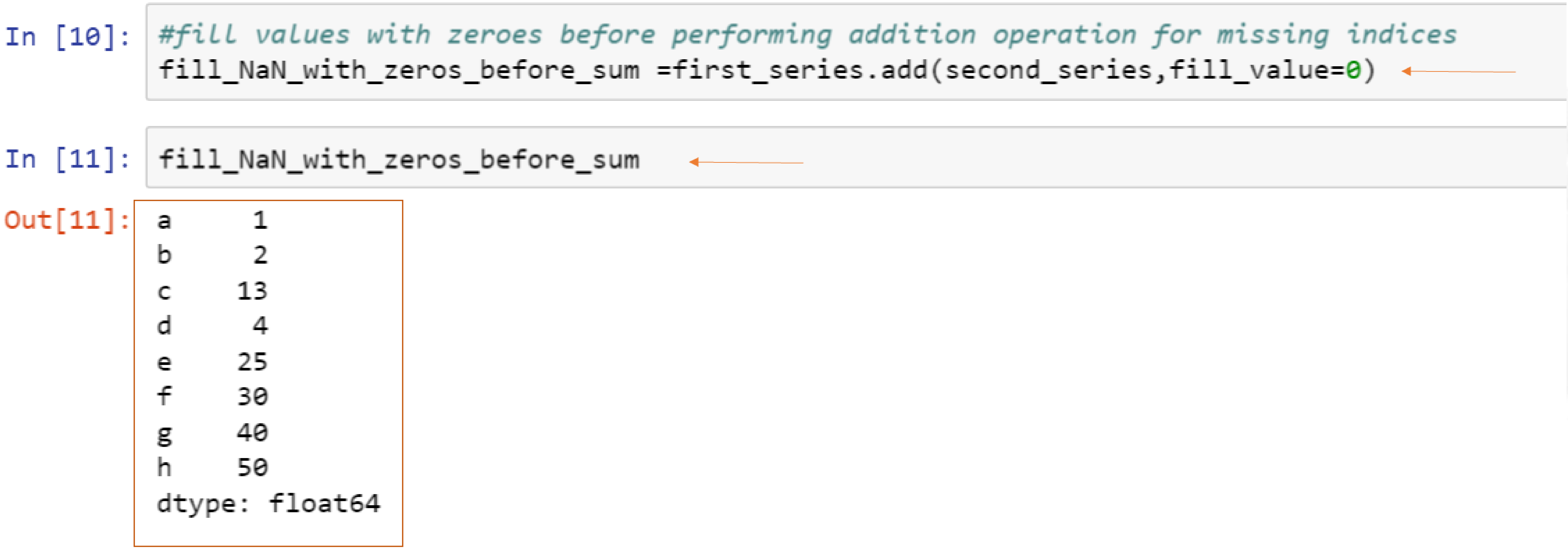
The fillna function fills all the uncommon indices with a number instead of dropping them.



```
In [8]:  dropna_s.fillna(0)

Out[8]:  c     13.0
         e     25.0
         dtype: float64

In [9]:  # Fill NaN( Not a Number) values with Zeroes (0)
         fillna_s = sum_of_series.fillna(0)

In [10]: fillna_s

Out[10]: a      0.0
         b      0.0
         c     13.0
         d      0.0
         e     25.0
         f      0.0
         g      0.0
         h      0.0
         dtype: float64
```

Fill the missing values with zero

Handling Missing Values with Functions: Example



```
In [10]: #fill values with zeroes before performing addition operation for missing indices
         fill_NaN_with_zeros_before_sum =first_series.add(second_series,fill_value=0)
```

```
In [11]: fill_NaN_with_zeros_before_sum
```

```
Out[11]: a     1
         b     2
         c    13
         d     4
         e    25
         f    30
         g    40
         h    50
         dtype: float64
```

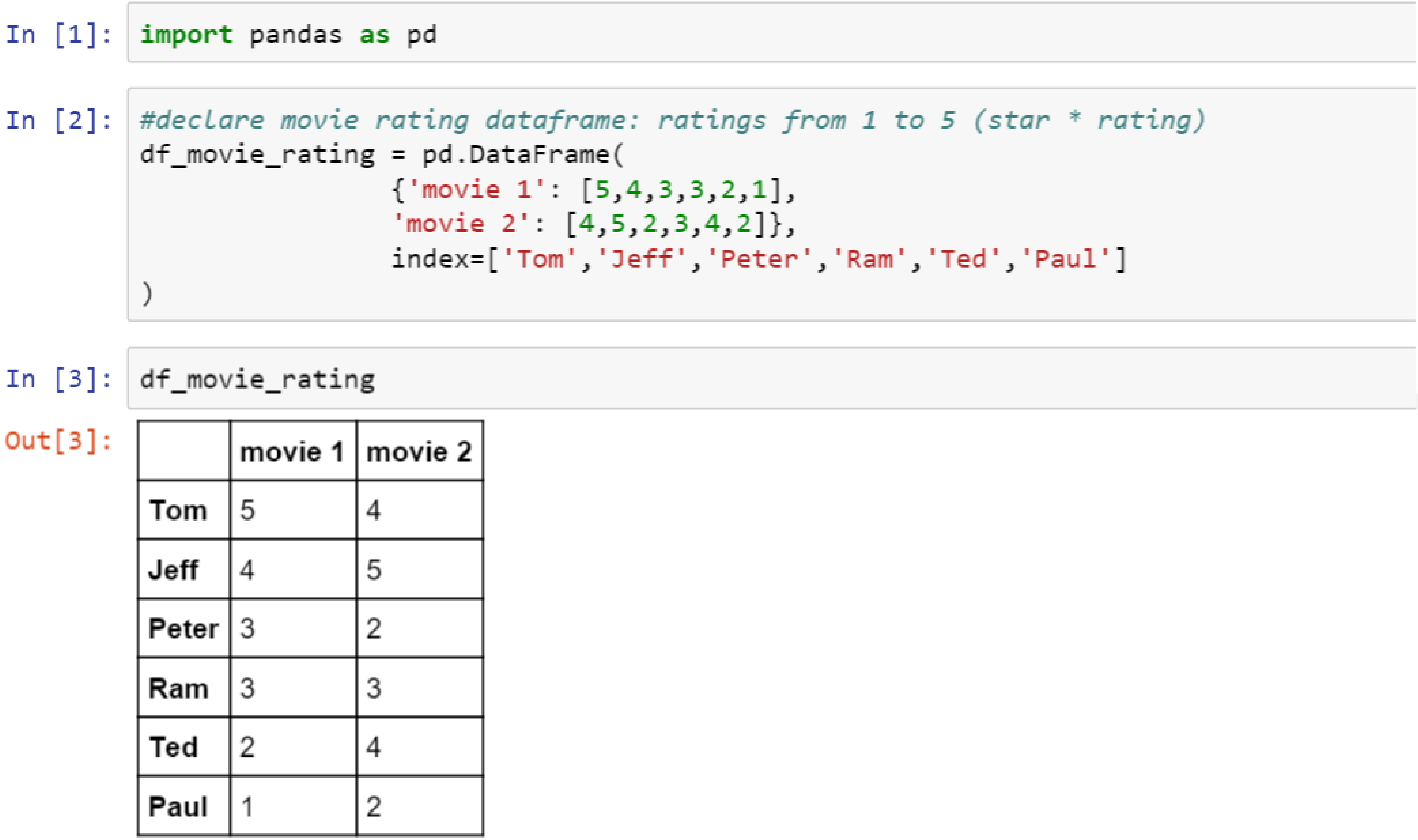
DATA AND

ARTIFICIAL INTELLIGENCE

Data Operation

Data Operation

Data operation can be performed through various built-in methods for faster data processing.



```
In [1]: import pandas as pd
```

```
In [2]: #declare movie rating dataframe: ratings from 1 to 5 (star * rating)
        df_movie_rating = pd.DataFrame(
                        {'movie 1': [5,4,3,3,2,1],
                        'movie 2': [4,5,2,3,4,2]},
                        index=['Tom','Jeff','Peter','Ram','Ted','Paul']
        )
```

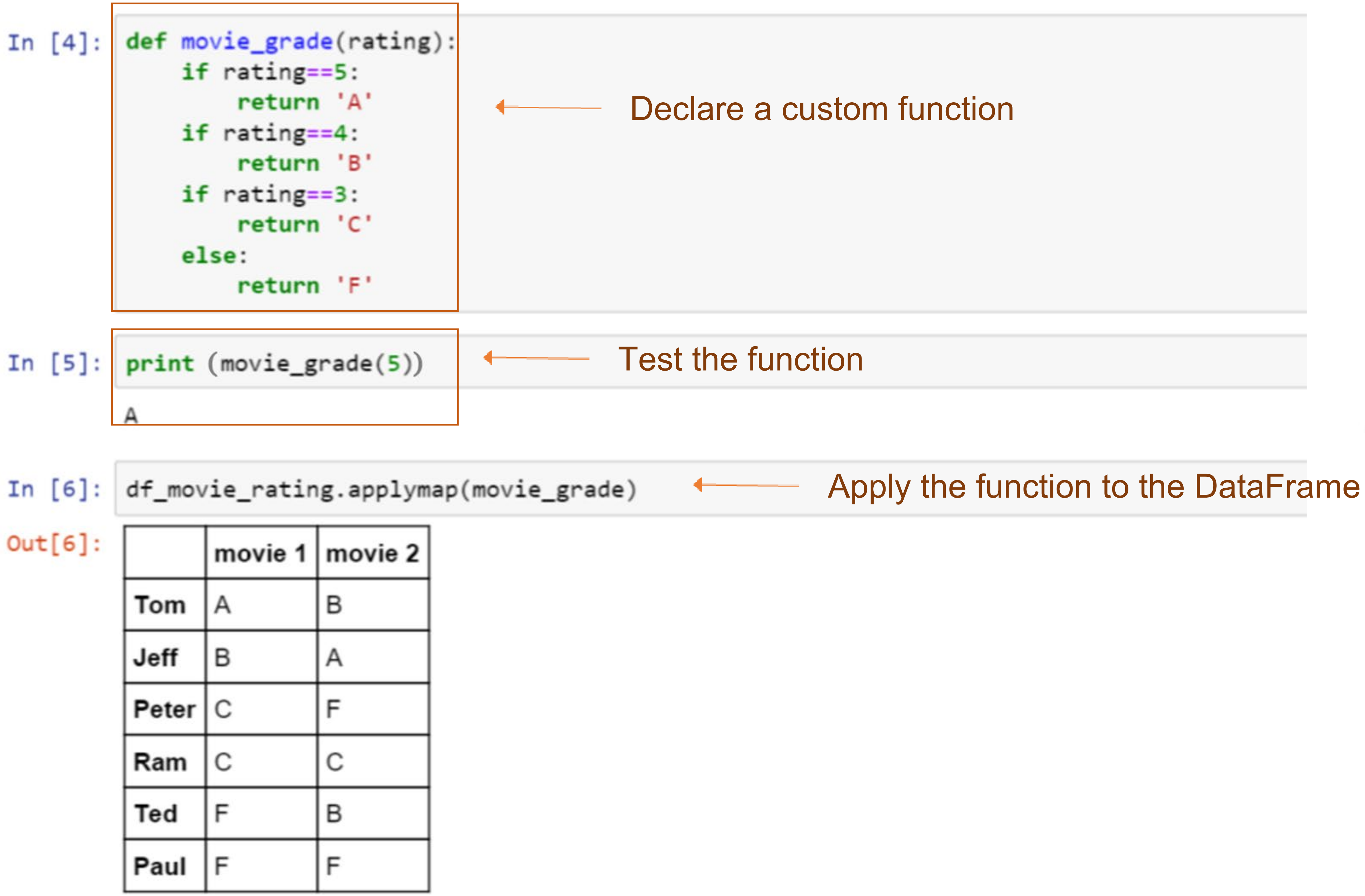
```
In [3]: df_movie_rating
```

Out[3]:

	movie 1	movie 2
Tom	5	4
Jeff	4	5
Peter	3	2
Ram	3	3
Ted	2	4
Paul	1	2

Data Operation with Functions

While performing data operation, custom functions can be applied using the applymap method.



In [4]:
```
def movie_grade(rating):
    if rating==5:
        return 'A'
    if rating==4:
        return 'B'
    if rating==3:
        return 'C'
    else:
        return 'F'
```

Declare a custom function

In [5]:
```
print (movie_grade(5))
```
```
A
```

Test the function

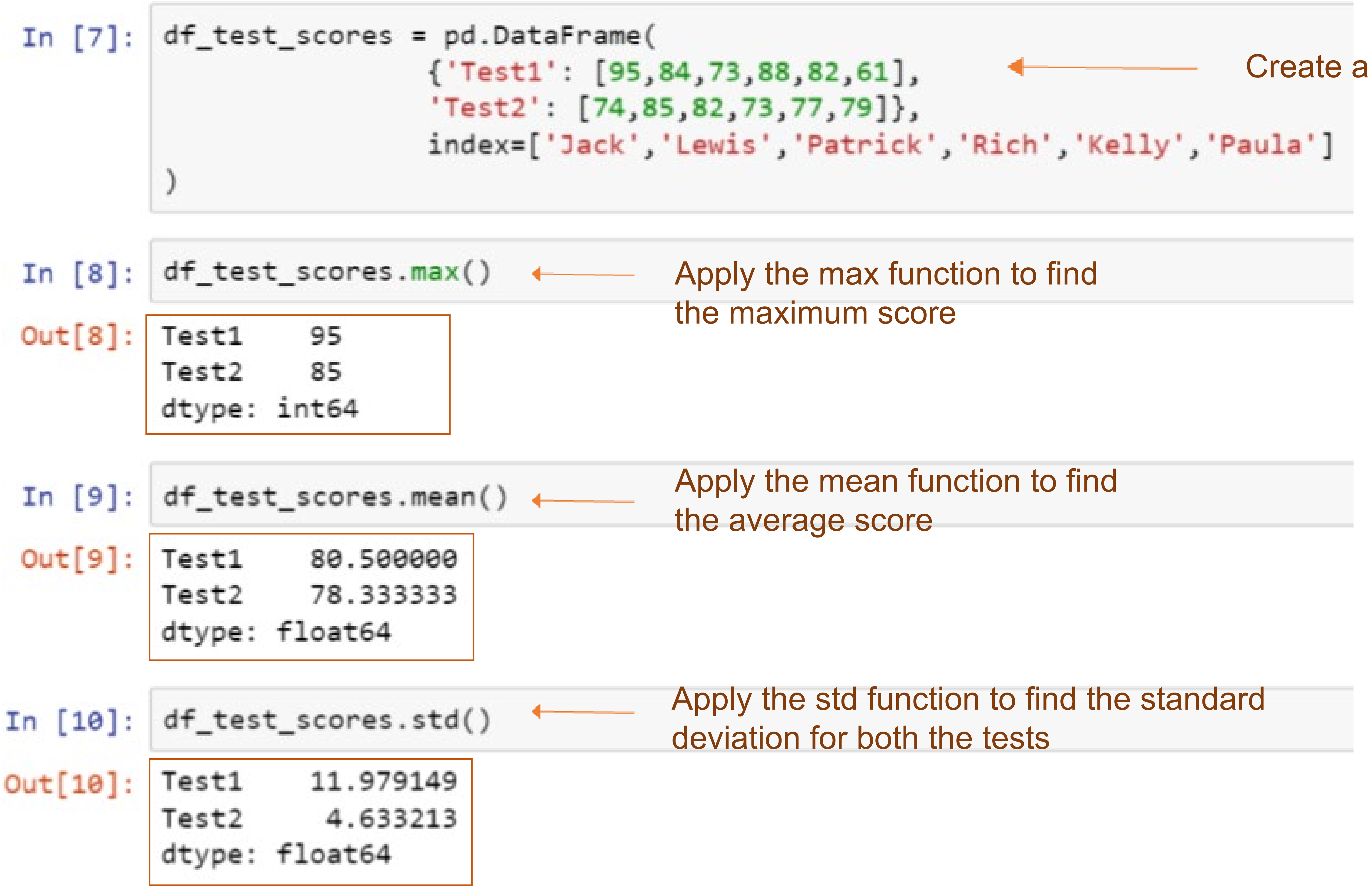
In [6]:
```
df_movie_rating.applymap(movie_grade)
```

Apply the function to the DataFrame

Out[6]:

	movie 1	movie 2
Tom	A	B
Jeff	B	A
Peter	C	F
Ram	C	C
Ted	F	B
Paul	F	F

Data Operation with Statistical Functions



```
In [7]: df_test_scores = pd.DataFrame(
                        {'Test1': [95,84,73,88,82,61],
                        'Test2': [74,85,82,73,77,79]},
                        index=['Jack','Lewis','Patrick','Rich','Kelly','Paula']
        )
```

Create a DataFrame with two test

```
In [8]: df_test_scores.max()
Out[8]: Test1     95
        Test2     85
        dtype: int64
```

Apply the max function to find the maximum score

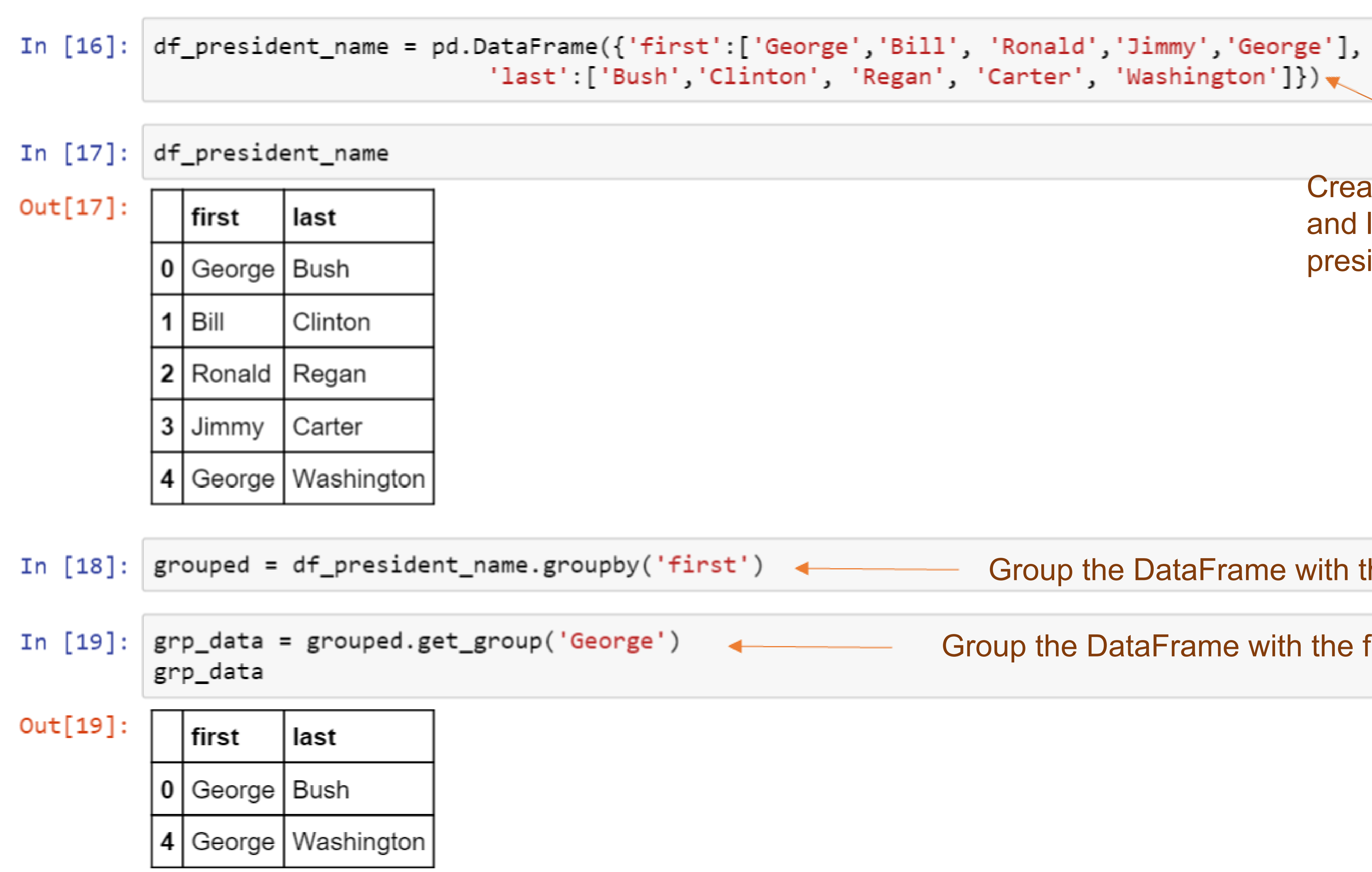
```
In [9]: df_test_scores.mean()
Out[9]: Test1     80.500000
        Test2     78.333333
        dtype: float64
```

Apply the mean function to find the average score

```
In [10]: df_test_scores.std()
Out[10]: Test1     11.979149
         Test2      4.633213
         dtype: float64
```

Apply the std function to find the standard deviation for both the tests

Data Operation Using Groupby



```
In [16]: df_president_name = pd.DataFrame({'first':['George','Bill', 'Ronald','Jimmy','George'],
                                     'last':['Bush','Clinton', 'Regan', 'Carter', 'Washington']})
```

Create a DataFrame with first and last name as former presidents

```
In [17]: df_president_name
```

Out[17]:

	first	last
0	George	Bush
1	Bill	Clinton
2	Ronald	Regan
3	Jimmy	Carter
4	George	Washington

```
In [18]: grouped = df_president_name.groupby('first')
```

Group the DataFrame with the first name

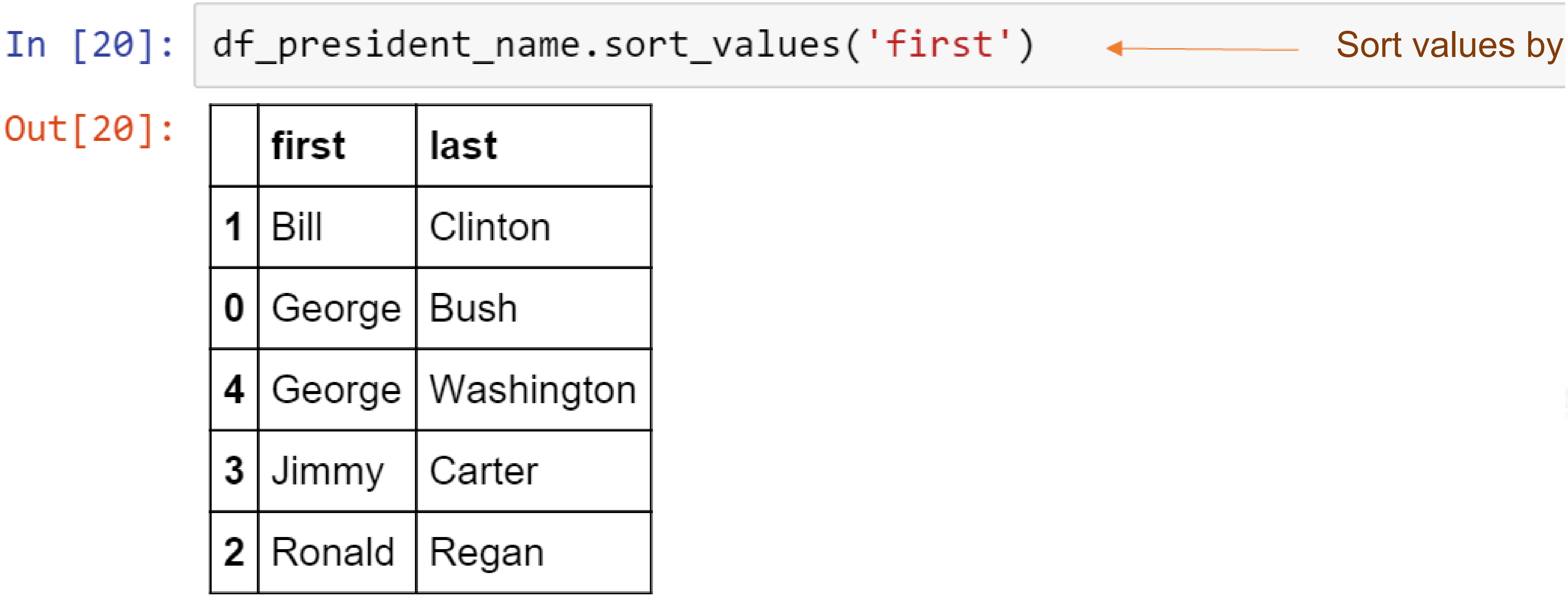
```
In [19]: grp_data = grouped.get_group('George')
         grp_data
```

Group the DataFrame with the first name

Out[19]:

	first	last
0	George	Bush
4	George	Washington

Data Operation Using Sorting



```
In [20]: df_president_name.sort_values('first')
```

Sort values by first name

```
Out[20]:
```

	first	last
1	Bill	Clinton
0	George	Bush
4	George	Washington
3	Jimmy	Carter
2	Ronald	Regan

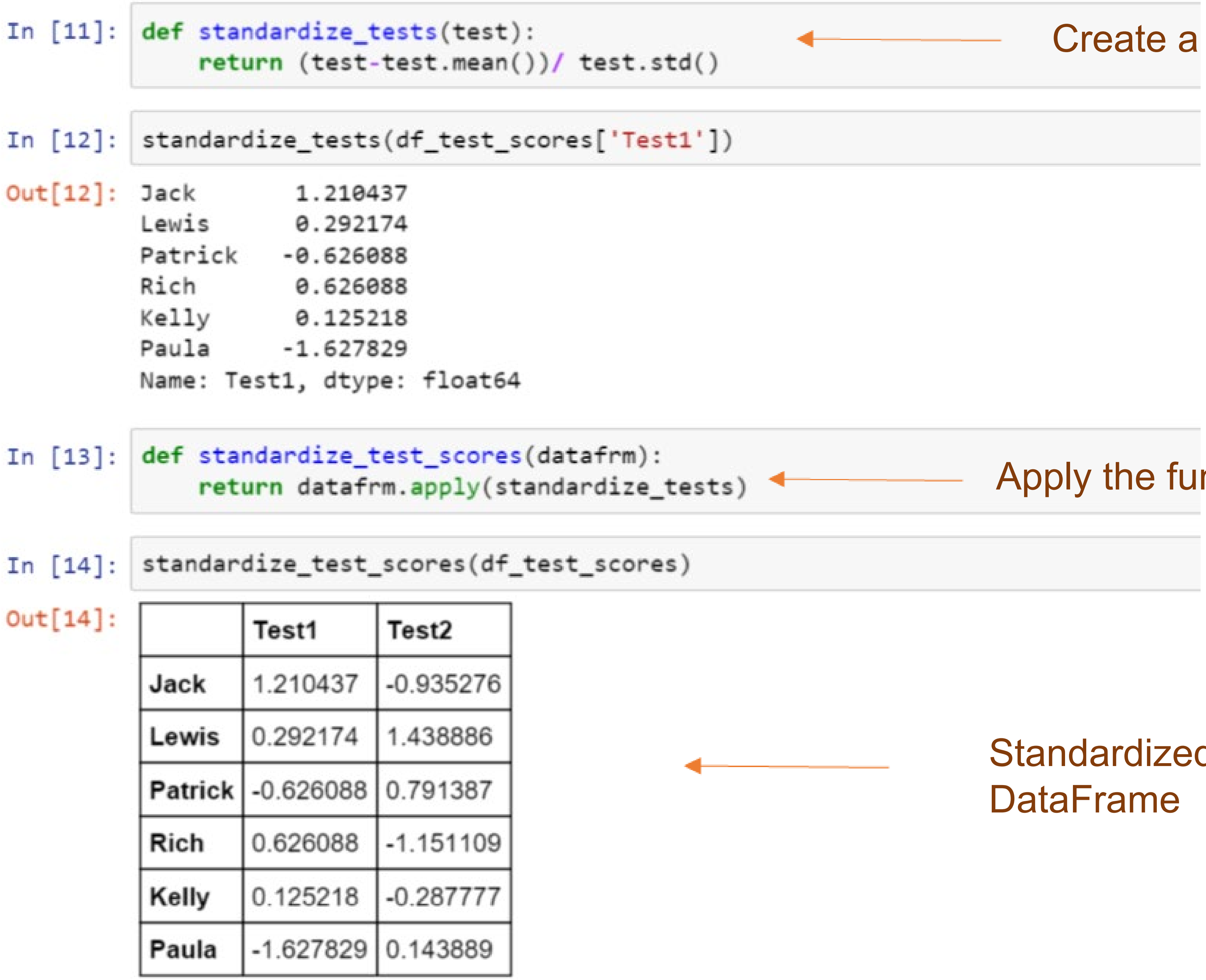
Data Operations

Problem Statement: Demonstrate how to perform data operations

Access: Click on the **Practice Labs** tab on the left side panel of the LMS. Copy or note the username and password that is generated. Click on the **Launch Lab** button. On the page that appears, enter the username and password in the respective fields, and click **Login** .

Data Standardization

Data Standardization



```
In [11]: def standardize_tests(test):
             return (test-test.mean())/ test.std()
```

Create a function to return the standardize value

```
In [12]: standardize_tests(df_test_scores['Test1'])

Out[12]: Jack        1.210437
         Lewis       0.292174
         Patrick    -0.626088
         Rich        0.626088
         Kelly       0.125218
         Paula      -1.627829
         Name: Test1, dtype: float64
```

```
In [13]: def standardize_test_scores(datafrm):
             return datafrm.apply(standardize_tests)
```

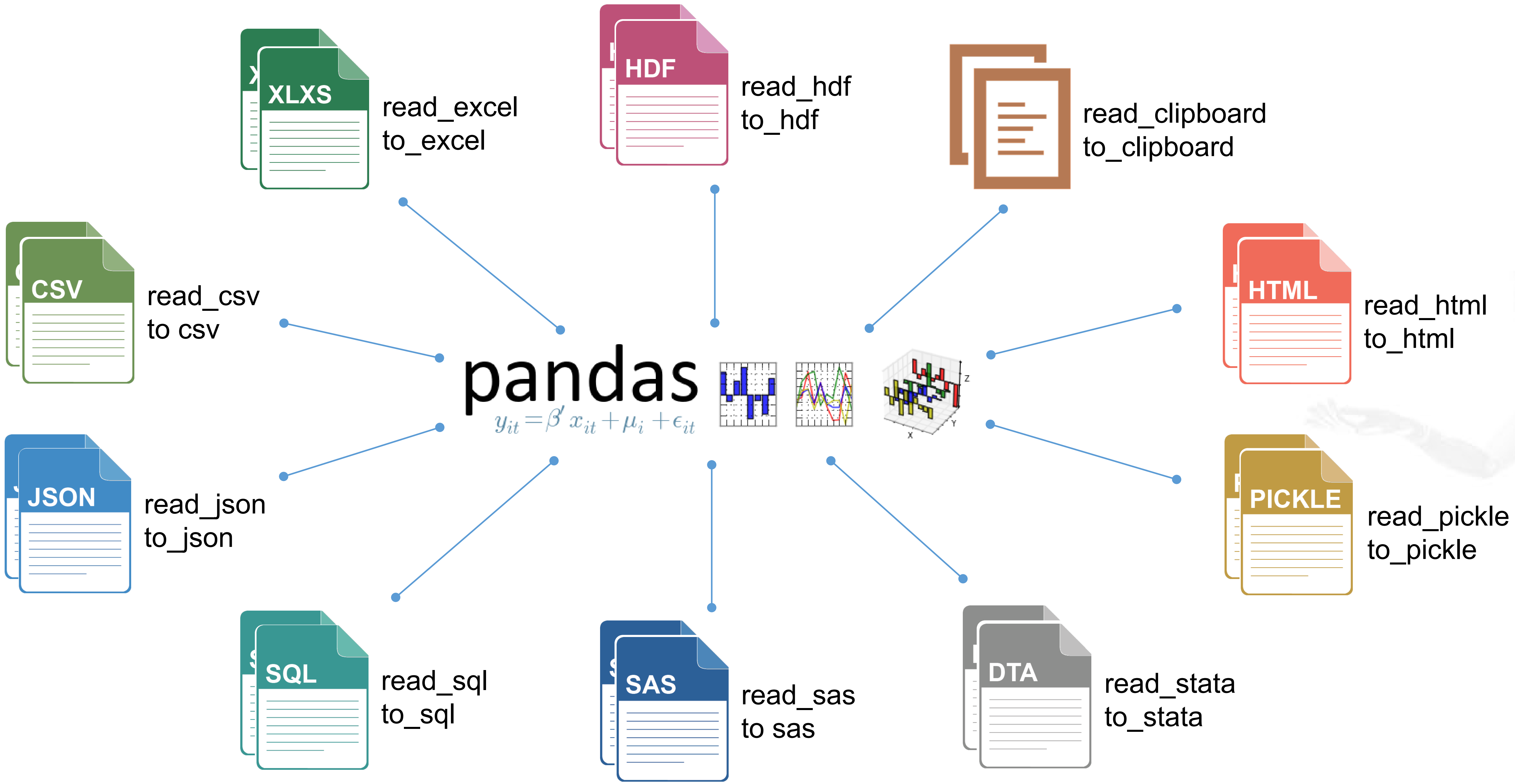
Apply the function to the entire dataset

```
In [14]: standardize_test_scores(df_test_scores)

Out[14]:
```

	Test1	Test2
Jack	1.210437	-0.935276
Lewis	0.292174	1.438886
Patrick	-0.626088	0.791387
Rich	0.626088	-1.151109
Kelly	0.125218	-0.287777
Paula	-1.627829	0.143889

Standardized test data is applied for the entire DataFrame

File Read and Write Support



read_excel
to_excel

read_hdf
to_hdf

read_clipboard
to_clipboard

read_csv
to csv

read_html
to_html

read_json
to_json

read_pickle
to_pickle

read_sql
to_sql

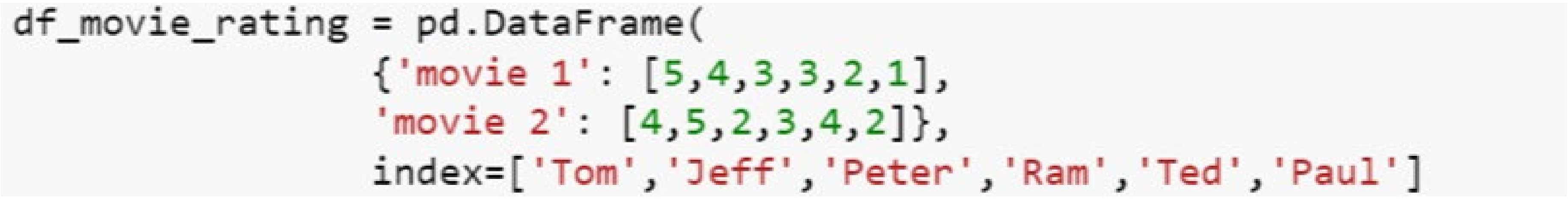
read_sas
to sas

read_stata
to_stata

Activity: Sequence it Right!

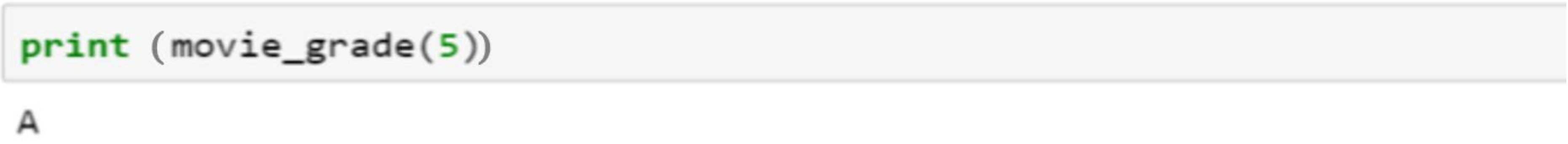
The code here is buggy. You have to correct its sequence to debug it. To do that, click any two code snippets, which you feel are out of place, to swap their places.

1



```
df_movie_rating = pd.DataFrame(
                {'movie 1': [5,4,3,3,2,1],
                'movie 2': [4,5,2,3,4,2]},
                index=['Tom','Jeff','Peter','Ram','Ted','Paul'])
```

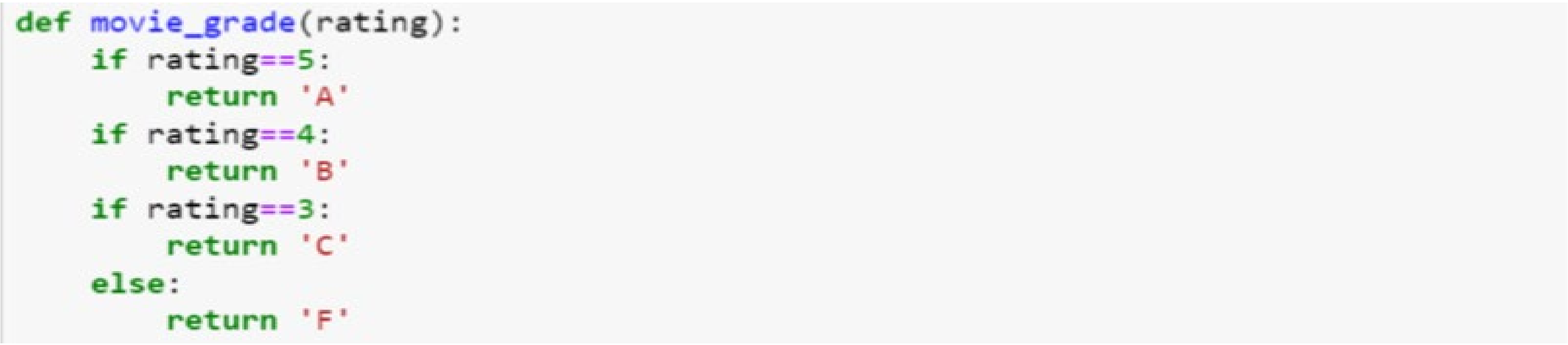
2



```
print (movie_grade(5))
```

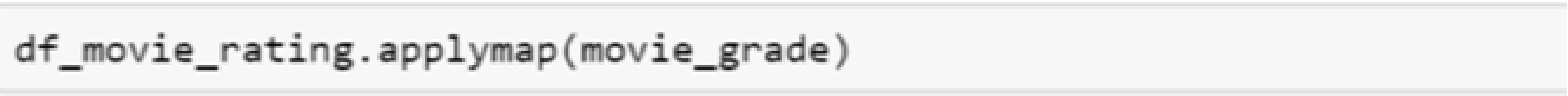
```
A
```

3



```
def movie_grade(rating):
    if rating==5:
        return 'A'
    if rating==4:
        return 'B'
    if rating==3:
        return 'C'
    else:
        return 'F'
```

4



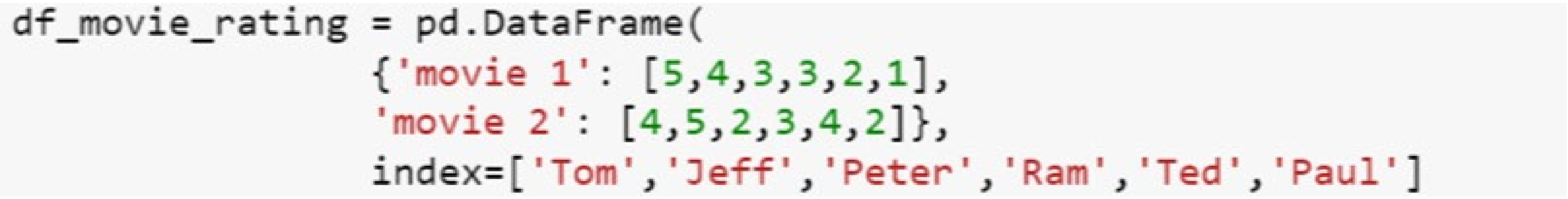
```
df_movie_rating.applymap(movie_grade)
```

Click any two code snippets to swap them.

Activity: Sequence it Right!

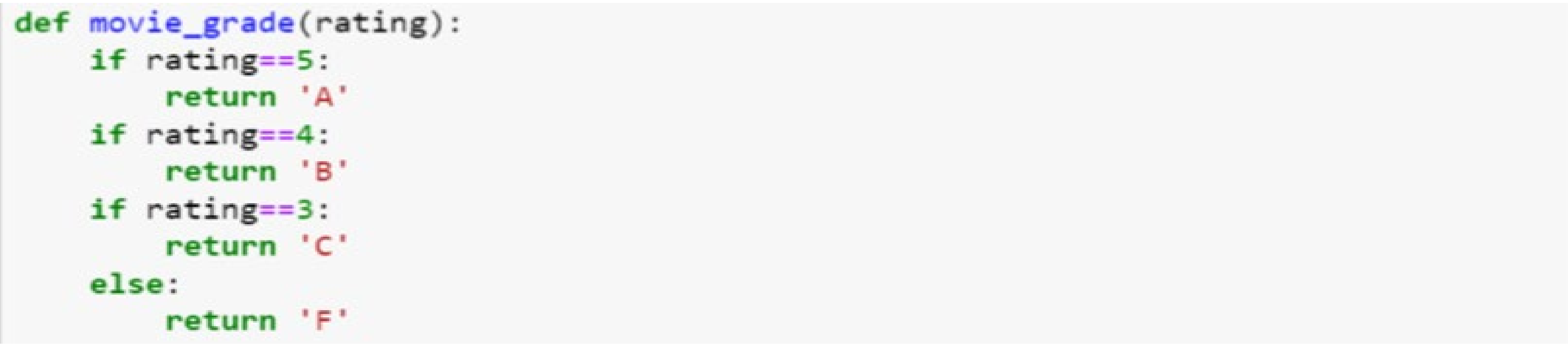
The code here is buggy. You must correct its sequence to debug it. To do that, click any two code snippets, which you feel are out of place, to swap their places.

1



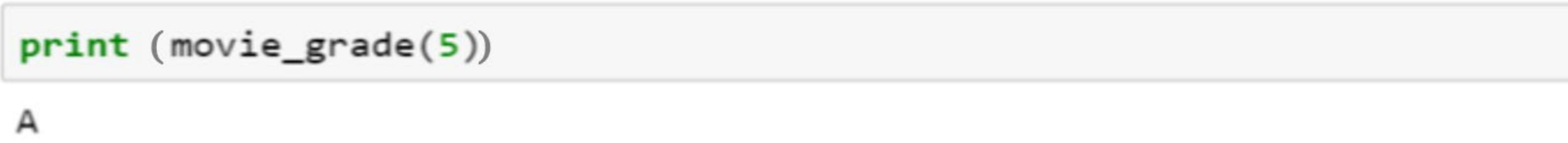
```
df_movie_rating = pd.DataFrame(
                 {'movie 1': [5,4,3,3,2,1],
                 'movie 2': [4,5,2,3,4,2]},
                 index=['Tom','Jeff','Peter','Ram','Ted','Paul']
```

3



```
def movie_grade(rating):
    if rating==5:
        return 'A'
    if rating==4:
        return 'B'
    if rating==3:
        return 'C'
    else:
        return 'F'
```

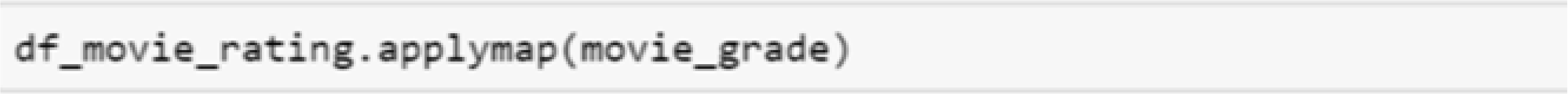
2



```
print (movie_grade(5))
```

```
A
```

4

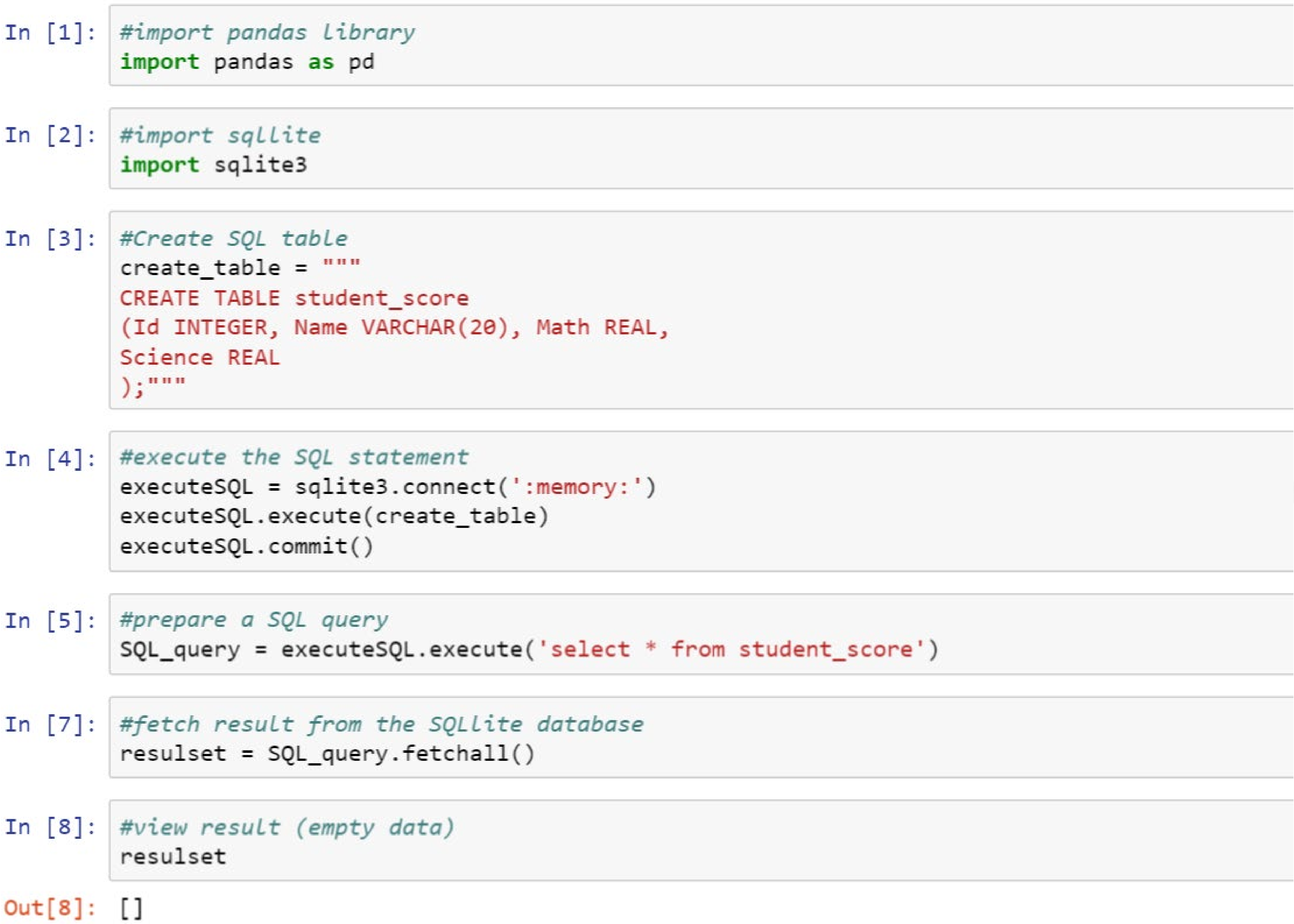


```
df_movie_rating.applymap(movie_grade)
```

Click any two code snippets to swap them.

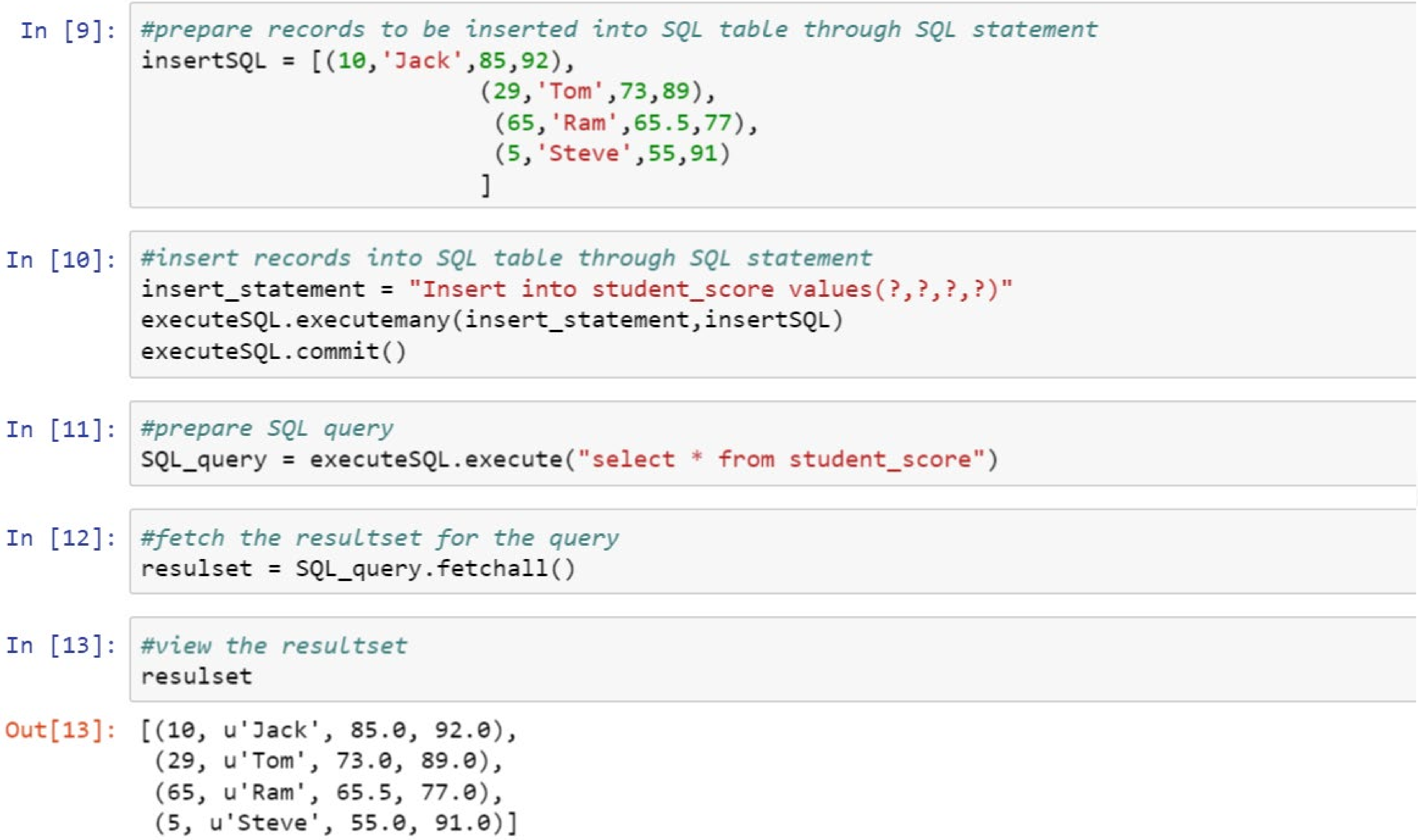
Pandas SQL Operations

Pandas SQL Operation



```
In [1]: #import pandas library
        import pandas as pd

In [2]: #import sqllite
        import sqlite3

In [3]: #Create SQL table
        create_table = """
        CREATE TABLE student_score
        (Id INTEGER, Name VARCHAR(20), Math REAL,
        Science REAL
        );"""

In [4]: #execute the SQL statement
        executeSQL = sqlite3.connect(':memory:')
        executeSQL.execute(create_table)
        executeSQL.commit()

In [5]: #prepare a SQL query
        SQL_query = executeSQL.execute('select * from student_score')

In [7]: #fetch result from the SQLlite database
        resulset = SQL_query.fetchall()

In [8]: #view result (empty data)
        resulset

Out[8]: []
```

Pandas SQL Operation



```
In [9]:  #prepare records to be inserted into SQL table through SQL statement
          insertSQL = [(10,'Jack',85,92),
                        (29,'Tom',73,89),
                         (65,'Ram',65.5,77),
                         (5,'Steve',55,91)
                        ]
```

```
In [10]: #insert records into SQL table through SQL statement
         insert_statement = "Insert into student_score values(?,?,?,?)"
         executeSQL.executemany(insert_statement,insertSQL)
         executeSQL.commit()
```

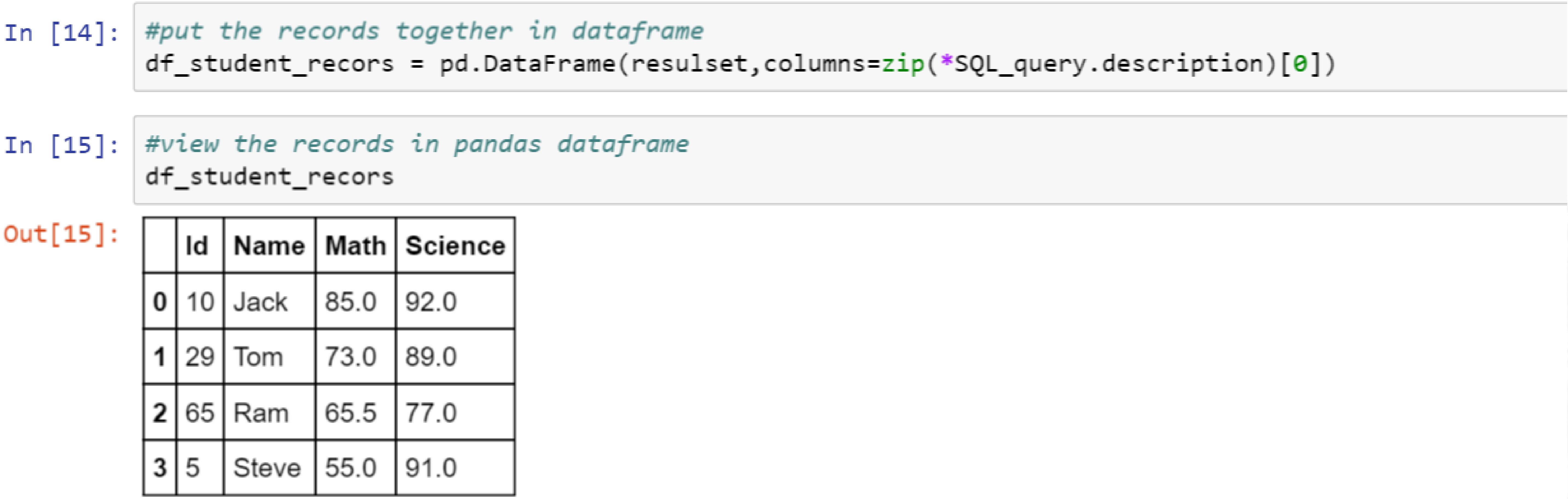
```
In [11]: #prepare SQL query
         SQL_query = executeSQL.execute("select * from student_score")
```

```
In [12]: #fetch the resultset for the query
         resulset = SQL_query.fetchall()
```

```
In [13]: #view the resultset
         resulset
```

```
Out[13]: [(10, u'Jack', 85.0, 92.0),
          (29, u'Tom', 73.0, 89.0),
          (65, u'Ram', 65.5, 77.0),
          (5, u'Steve', 55.0, 91.0)]
```

Pandas SQL Operation



In [14]:

```
#put the records together in dataframe
df_student_recors = pd.DataFrame(resulset,columns=zip(*SQL_query.description)[0])
```

In [15]:

```
#view the records in pandas dataframe
df_student_recors
```

Out[15]:

	Id	Name	Math	Science
0	10	Jack	85.0	92.0
1	29	Tom	73.0	89.0
2	65	Ram	65.5	77.0
3	5	Steve	55.0	91.0

Analyze the Federal Aviation Authority (FAA) Dataset using Pandas

Problem Statement:

Analyze the Federal Aviation Authority (FAA) dataset using Pandas to do the following:

1.View

a. Aircraft manufacturer name

b. State name

c. Aircraft model name

d. Text information

e. Flight phase

f. Event description type

g. Fatal flag

2. Clean the dataset and replace the fatal flag NaN with “No”

3. Find the aircraft types and their occurrences in the dataset

4. Remove all the observations where aircraft names are not available

5. Display the observations where fatal flag is “Yes”

Analyze the Federal Aviation Authority (FAA) Dataset using Pandas

Instructions to perform the assignment:

- Download the FAA dataset from the “Resource” tab. Upload the dataset to your Jupyter notebook to view and evaluate it.

Common instructions:

- If you are new to Python, download the “Anaconda Installation Instructions” document from the “Resources” tab to view the steps for installing Anaconda and the Jupyter notebook.
- Download the “Assignment 01” notebook and upload it on the Jupyter notebook to access it.
- Follow the cues provided to complete the assignment.

Analyzing the Dataset

Problem Statement:
A dataset in CSV format is given for the Fire Department of the New York City. Analyze the dataset to determine:

1. The total number of fire department facilities in the New York city
2. The number of fire department facilities in each borough
3. The facility names in Manhattan

Analyzing the Dataset

Instructions to perform the assignment:

- Download the FDNY dataset from the “Resource” tab. You can upload the dataset to your Jupyter notebook to use it.

Common instructions:

- If you are new to Python, download the “Anaconda Installation Instructions” document from the “Resources” tab to view the steps for installing Anaconda and the Jupyter notebook.
- Download the “Assignment 02” notebook and upload it on the Jupyter notebook to access it.
- Follow the cues provided to complete the assignment.

Key Takeaways

You are now able to:

- Explain Pandas and its features
- List different data structures of Pandas
- Outline the process to create series and DataFrame with data inputs
- Explain how to view, select, and access elements in a data structure
- Describe the procedure to handle vectorized operations
- Illustrate how to handle missing values
- Analyze data with different data operation methods

Knowledge Check

Knowledge Check

1

How is an index for data elements assigned while creating a Pandas series ? Select all that apply?

a. Created automatically

b. Needs to be assigned

c. Once created can not be changed or altered

d. Index is not applicable as series is one-dimensional

Knowledge Check

1

How is an index for data elements assigned while creating a Pandas series ? Select all that apply?

a. Created automatically

b. Needs to be assigned

c. Once created can not be changed or altered

d. Index is not applicable as series is one-dimensional

The correct answer is **a, b**

Data alignment is intrinsic in Pandas data structure and happens automatically. One can also assign index to data elements.

Knowledge Check

2

What will the result be in vector addition if label is not found in a series?

a. Marked as zeros for missing labels

b. Labels will be skipped

c. Marked as NaN for missing labels

d. Will prompt an exception, index not found

Knowledge Check

2

What will the result be in vector addition if label is not found in a series?

a. Marked as zeros for missing labels

b. Labels will be skipped

c. Marked as NaN for missing labels

d. Will prompt an exception, index not found

The correct answer is **c**

The result will be marked as NaN (Not a Number) for missing labels.

Knowledge Check

3

What is the result of DataFrame[3:9]?

a. Series with sliced index from 3 to 9

b. dict of index positions 3 and 9

c. DataFrame of sliced rows index from 3 to 9

d. DataFrame with data elements at index 3 to 9

Knowledge Check

3

What is the result of DataFrame[3:9]?

a. Series with sliced index from 3 to 9

b. dict of index positions 3 and 9

c. DataFrame of sliced rows index from 3 to 9

d. DataFrame with data elements at index 3 to 9

The correct answer is **c**

This is DataFrame slicing technique with indexing or selection on data elements. When a user passes the range 3:9, the entire range from 3 to 9 gets sliced and displayed as output.

Knowledge Check

4

What does the fillna() method do?

a. Fills all NaN values with zeros

b. Fills all NaN values with one

c. Fills all NaN values with values mentioned in the parenthesis

d. Drops NaN values from the dataset

Knowledge Check

4

What does the fillna() method do?

a. Fills all NaN values with zeros

b. Fills all NaN values with one

c. Fills all NaN values with values mentioned in the parenthesis

d. Drops NaN values from the dataset

The correct answer is **c**

fillna is one of the basic methods to fill NaN values in a dataset with a desired value by passing that in parenthesis.

Knowledge Check

5

Which of the following data structures is used to store three -dimensional data?

a. Series

b. DataFrame

c. Panel

d. PanelND

Knowledge Check

5

Which of the following data structures is used to store three-dimensional data?

a. Series

b. DataFrame

c. Panel

d. PanelND

The correct answer is **c**

Panel is a data structure used to store three-dimensional data.

Knowledge Check

6

Which method is used for label -location indexing by label?

a. iat

b. iloc

c. loc

d. std

Knowledge Check

6

Which method is used for label-location indexing by label?

a. iat

b. iloc

c. loc

d. std

The correct answer is c

The loc method is used for label-location indexing by label; iat is strictly integer location and iloc is integer-location-based indexing by position.

Knowledge Check

7

While viewing a dataframe, head() method will _____.

a. return only the first row

b. return only headers or column name of the DataFrame

c. return the first five rows of the DataFrame

d. throw an exception as it expects parameter(number) in parenthesis

Knowledge Check

7

While viewing a dataframe, head() method will _____.

a. return only the first row

b. return only headers or column name of the DataFrame

c. return the first five rows of the DataFrame

d. throw an exception as it expects parameter(number) in parenthesis

The correct answer is **c**

The default value is 5 if nothing is passed in head method. So, it will return the first five rows of the DataFrame.

Thank You