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

```
In [2]:  pd.__version__  #To Check version
```

```
Out[2]:  '2.2.2'
```

```
In [3]:  store = pd.read_csv(r'D:\Full Stack Data Scientist and AI\March 19 - Introductio
```

```
In [40]: store   #store is the name of the object, created in Python. Called the variable
```

Out[40]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Or
0	Office Supplies	Houston	United States	Darren Powers	Message Book	03-01-2020	20 103
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	04-01-2020	20 112
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	04-01-2020	20 112
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	04-01-2020	20 112
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	05-01-2020	20 141
...	...	...	...	...	...	...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	20 143
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	20 115
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	20 156
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	20 143
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	20 143

10194 rows × 19 columns

In [5]:

```
id(store)  #id gives address of memory allocation
```

```
Out[5]: 2882727282448
```

```
In [6]: len(store)  #Numbers of Rows
```

```
Out[6]: 10194
```

```
In [7]: store.shape  #shape gives -> Gives dimensions i.e Numbers of rows and columns in
```

```
Out[7]: (10194, 19)
```

```
In [8]: store.columns  #columns gives column names
```

```
Out[8]: Index(['Category', 'City', 'Country/Region', 'Customer Name', 'Manufacturer',
               'Order Date', 'Order ID', 'Postal Code', 'Product Name', 'Region',
               'Segment', 'Ship Date', 'Ship Mode', 'State/Province', 'Sub-Category',
               'Discount', 'Profit', 'Quantity', 'Sales'],
             dtype='object')
```

dtype='object' but actually datatype is int, float. But here system by default considered data type as object.

```
In [10]: len(store.columns)
```

```
Out[10]: 19
```

To check NULL Values

```
In [12]: store.isnull()  #Hey Python, is there any NULL value in the data set?
```

Out[12]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Posta Code
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	..
10189	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False

10194 rows × 19 columns

There is no null value, thus we get False. If there are any missing values then the answer is True

In [14]:

```
store.notnull()  #Hey Python, is there any Not NULL value in the data set?
```

Out[14]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Postal Code
0	True	True	True	True	True	True	True	True
1	True	True	True	True	True	True	True	True
2	True	True	True	True	True	True	True	True
3	True	True	True	True	True	True	True	True
4	True	True	True	True	True	True	True	True
...	...	...	...	...	...	...	...	...
10189	True	True	True	True	True	True	True	True
10190	True	True	True	True	True	True	True	True
10191	True	True	True	True	True	True	True	True
10192	True	True	True	True	True	True	True	True
10193	True	True	True	True	True	True	True	True

10194 rows × 19 columns

In [15]:

```
store.isnull().sum()
```

Out[15]:

```
Category          0
City              0
Country/Region    0
Customer Name     0
Manufacturer      0
Order Date        0
Order ID          0
Postal Code       0
Product Name      0
Region            0
Segment           0
Ship Date         0
Ship Mode         0
State/Province    0
Sub-Category      0
Discount          0
Profit            0
Quantity          0
Sales             0
dtype: int64
```

0 means 0 missing values

In [17]:

```
store[:]  #Store slice -> Prints entire data set
```

Out[17]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Or
0	Office Supplies	Houston	United States	Darren Powers	Message Book	03-01-2020	20 103
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	04-01-2020	20 112
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	04-01-2020	20 112
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	04-01-2020	20 112
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	05-01-2020	20 141
...	...	...	...	...	...	...	
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	20 143
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	20 115
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	20 156
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	20 143
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	20 143

10194 rows × 19 columns

In [18]:

```
store[0:10]  #This prints 0 to 10(n-1)th i.e 9th row (records). Row means record
```

Out[18]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Po C
0	Office Supplies	Houston	United States	Darren Powers	Message Book	03-01-2020	US-2020-103800	77
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	04-01-2020	US-2020-112326	60
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	04-01-2020	US-2020-112326	60
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	04-01-2020	US-2020-112326	60
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	05-01-2020	US-2020-141817	19
5	Furniture	Henderson	United States	Maria Etezadi	Global	06-01-2020	US-2020-167199	42
6	Office Supplies	Henderson	United States	Maria Etezadi	Rogers	06-01-2020	US-2020-167199	42
7	Office Supplies	Athens	United States	Jack O'Briant	Dixon	06-01-2020	US-2020-106054	30
8	Office Supplies	Henderson	United States	Maria Etezadi	Ibico	06-01-2020	US-2020-167199	42

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Po C
9	Office Supplies	Henderson	United States	Maria Etezadi	Alliance	06-01-2020	US-2020-167199	42

In Numpy we don't get 0, 1, 2, 3..There we count manually

But in Pandas dataFrame, we get index -> 0, 1, 2, 3..

In [20]:
```
store[0:20:5]
```

Out[20]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	I
0	Office Supplies	Houston	United States	Darren Powers	Message Book	03-01-2020	US-2020-103800	
5	Furniture	Henderson	United States	Maria Etezadi	Global	06-01-2020	US-2020-167199	
10	Office Supplies	Henderson	United States	Maria Etezadi	Southworth	06-01-2020	US-2020-167199	
15	Office Supplies	Huntsville	United States	Vivek Sundaresam	Acco	07-01-2020	US-2020-105417	

In [38]:
```
store.head()  #head() function gives top 5 rows/ displays top 5 records
```

Out[38]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Po C
0	Office Supplies	Houston	United States	Darren Powers	Message Book	03-01-2020	US-2020-103800	77
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	04-01-2020	US-2020-112326	60
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	04-01-2020	US-2020-112326	60
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	04-01-2020	US-2020-112326	60
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	05-01-2020	US-2020-141817	19

In [42]:

```
store.tail()  #tail() function gives bottom 5 rows/ displays bottom 5 records
```

Out[42]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Or
10189	Office Supplies	New York City	United States	Patrick O'Donnell	Wilson Jones	30-12-2023	20 143
10190	Office Supplies	Fairfield	United States	Erica Bern	GBC	30-12-2023	20 115
10191	Office Supplies	Loveland	United States	Jill Matthias	Other	30-12-2023	20 156
10192	Technology	New York City	United States	Patrick O'Donnell	Other	30-12-2023	20 143
10193	Office Supplies	Charlottetown	Canada	Harry Olson	Wilson Jones	30-12-2023	20 143

store. #store . tab -> Displays all functionalities of pandas

In [54]:
```
store.isna()  #isna() and isnull() both are same
```

Out[54]:

	Category	City	Country/Region	Customer Name	Manufacturer	Order Date	Order ID	Posta Code
0	False	False	False	False	False	False	False	False
1	False	False	False	False	False	False	False	False
2	False	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...	..
10189	False	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False	False

10194 rows × 19 columns

Introduction to Statistical Concept in Pandas

Pandas is a library which handles rows, columns and series.

- Excel sheet means either number or text
- Number -> Numerical Data
- Text data -> Categorical Data
- Dataset is formed with a combination of numerical data and categorical data.
- Numerical data and Categorical data is called Statistical World.
- If dataset is number -> We call it numerical
- If dataset is text -> We call it categorical

In [62]:

```
store.describe()
```

Out[62]:

	Discount	Profit	Quantity	Sales
count	10194.000000	10194.000000	10194.000000	10194.000000
mean	0.155385	28.673417	3.791838	228.225854
std	0.206249	232.465115	2.228317	619.906839
min	0.000000	-6599.978000	1.000000	0.444000
25%	0.000000	1.760800	2.000000	17.220000
50%	0.200000	8.690000	3.000000	53.910000
75%	0.200000	29.297925	5.000000	209.500000
max	0.800000	8399.976000	14.000000	22638.480000

- describe() refers to descriptive statistics
- Only Discount, Profit, Quantity, Sales have numbers.
- Thus, describe() displays these attributes as describe() by default displays only numerical data

In [ ]: