

s3eeeznvu

March 20, 2025

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

```
[2]: pd.__version__
```

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

```
[3]: store = pd.read_csv(r"C:\Users\Dhanwantari Devre\Sample_orders.csv")
```

```
[4]: store
```

```
[4]:
```

	Category	City	Country/Region	Customer Name \
0	Office Supplies	Houston	United States	Darren Powers
1	Office Supplies	Naperville	United States	Phillina Ober
2	Office Supplies	Naperville	United States	Phillina Ober
3	Office Supplies	Naperville	United States	Phillina Ober
4	Office Supplies	Philadelphia	United States	Mick Brown
...	...	...	...	...
10189	Office Supplies	New York City	United States	Patrick O'Donnell
10190	Office Supplies	Fairfield	United States	Erica Bern
10191	Office Supplies	Loveland	United States	Jill Matthias
10192	Technology	New York City	United States	Patrick O'Donnell
10193	Office Supplies	Charlottetown	Canada	Harry Olson

	Manufacturer	Order Date	Order ID	Postal Code \
0	Message Book	03-01-2020	US-2020-103800	77015
1	GBC	04-01-2020	US-2020-112326	60540
2	Avery	04-01-2020	US-2020-112326	60540
3	SAFCO	04-01-2020	US-2020-112326	60540
4	Avery	05-01-2020	US-2020-141817	19143
...	...	...	...	...
10189	Wilson Jones	30-12-2023	US-2023-143259	10009
10190	GBC	30-12-2023	US-2023-115427	94533
10191	Other	30-12-2023	US-2023-156720	80538
10192	Other	30-12-2023	US-2023-143259	10009
10193	Wilson Jones	30-12-2023	CA-2023-143500	COA

Product Name    Region \

0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central
1	GBC Standard Plastic Binding Systems Combs	Central
2	Avery 508	Central
3	SAFCO Boltless Steel Shelving	Central
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East
...	...	...
10189	Wilson Jones Legal Size Ring Binders	East
10190	GBC Binding covers	West
10191	Bagged Rubber Bands	West
10192	Gear Head AU3700S Headset	East
10193	Wilson Jones Impact Binders	East

	Segment	Ship Date	Ship Mode	State/Province \
0	Consumer	07-01-2020	Standard Class	Texas
1	Home Office	08-01-2020	Standard Class	Illinois
2	Home Office	08-01-2020	Standard Class	Illinois
3	Home Office	08-01-2020	Standard Class	Illinois
4	Consumer	12-01-2020	Standard Class	Pennsylvania
...	...	...	...	...
10189	Consumer	03-01-2024	Standard Class	New York
10190	Corporate	03-01-2024	Standard Class	California
10191	Consumer	03-01-2024	Standard Class	Colorado
10192	Consumer	03-01-2024	Standard Class	New York
10193	Consumer	03-01-2024	Standard Class	Prince Edward Island

	Sub-Category	Discount	Profit	Quantity	Sales
0	Paper	0.2	5.5512	2	16.448
1	Binders	0.8	-5.4870	2	3.540
2	Labels	0.2	4.2717	3	11.784
3	Storage	0.2	-64.7748	3	272.736
4	Art	0.2	4.8840	3	19.536
...	...	...	...	...	...
10189	Binders	0.2	19.7910	3	52.776
10190	Binders	0.2	6.4750	2	20.720
10191	Fasteners	0.2	-0.6048	3	3.024
10192	Phones	0.0	2.7279	7	90.930
10193	Binders	0.2	-0.6048	3	3.024

[10194 rows x 19 columns]

```
[5]: id(store)
```

```
[5]: 2385804921744
```

```
[6]: len(store)
```

```
[6]: 10194
```

```
[7]: store.shape
```

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

```
[8]: store.columns
```

```
[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')
```

```
[9]: len(store.columns)
```

```
[9]: 19
```

```
[10]: store.isnull()
```

```
[10]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
0	False	False	False	False	False	
1	False	False	False	False	False	
2	False	False	False	False	False	
3	False	False	False	False	False	
4	False	False	False	False	False	
...	...	...	...	...	...	
10189	False	False	False	False	False	
10190	False	False	False	False	False	
10191	False	False	False	False	False	
10192	False	False	False	False	False	
10193	False	False	False	False	False	

  

	Order Date	Order ID	Postal Code	Product Name	Region	Segment	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	
2	False	False	False	False	False	False	
3	False	False	False	False	False	False	
4	False	False	False	False	False	False	
...	...	...	...	...	...	...	
10189	False	False	False	False	False	False	
10190	False	False	False	False	False	False	
10191	False	False	False	False	False	False	
10192	False	False	False	False	False	False	
10193	False	False	False	False	False	False	

  

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	

2	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...
10189	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False

	Quantity	Sales
0	False	False
1	False	False
2	False	False
3	False	False
4	False	False
...	...	...
10189	False	False
10190	False	False
10191	False	False
10192	False	False
10193	False	False

[10194 rows x 19 columns]

```
[11]: store.isnull().sum()
```

```
[11]: 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
```

```
[12]: store[:]
```

```
[12]:
```

	Category	City	Country/Region	Customer Name \
0	Office Supplies	Houston	United States	Darren Powers
1	Office Supplies	Naperville	United States	Phillina Ober
2	Office Supplies	Naperville	United States	Phillina Ober
3	Office Supplies	Naperville	United States	Phillina Ober
4	Office Supplies	Philadelphia	United States	Mick Brown
...	...	...	...	...
10189	Office Supplies	New York City	United States	Patrick O'Donnell
10190	Office Supplies	Fairfield	United States	Erica Bern
10191	Office Supplies	Loveland	United States	Jill Matthias
10192	Technology	New York City	United States	Patrick O'Donnell
10193	Office Supplies	Charlottetown	Canada	Harry Olson

	Manufacturer	Order Date	Order ID	Postal Code \
0	Message Book	03-01-2020	US-2020-103800	77015
1	GBC	04-01-2020	US-2020-112326	60540
2	Avery	04-01-2020	US-2020-112326	60540
3	SAFCO	04-01-2020	US-2020-112326	60540
4	Avery	05-01-2020	US-2020-141817	19143
...	...	...	...	...
10189	Wilson Jones	30-12-2023	US-2023-143259	10009
10190	GBC	30-12-2023	US-2023-115427	94533
10191	Other	30-12-2023	US-2023-156720	80538
10192	Other	30-12-2023	US-2023-143259	10009
10193	Wilson Jones	30-12-2023	CA-2023-143500	COA

	Product Name	Region \
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central
1	GBC Standard Plastic Binding Systems Combs	Central
2	Avery 508	Central
3	SAFCO Boltless Steel Shelving	Central
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East
...	...	...
10189	Wilson Jones Legal Size Ring Binders	East
10190	GBC Binding covers	West
10191	Bagged Rubber Bands	West
10192	Gear Head AU3700S Headset	East
10193	Wilson Jones Impact Binders	East

	Segment	Ship Date	Ship Mode	State/Province \
0	Consumer	07-01-2020	Standard Class	Texas
1	Home Office	08-01-2020	Standard Class	Illinois
2	Home Office	08-01-2020	Standard Class	Illinois
3	Home Office	08-01-2020	Standard Class	Illinois
4	Consumer	12-01-2020	Standard Class	Pennsylvania

```

...
10189    Consumer  03-01-2024  Standard Class      New York
10190    Corporate  03-01-2024  Standard Class      California
10191    Consumer  03-01-2024  Standard Class      Colorado
10192    Consumer  03-01-2024  Standard Class      New York
10193    Consumer  03-01-2024  Standard Class  Prince Edward Island

```

```

      Sub-Category  Discount  Profit  Quantity  Sales
0      Paper      0.2    5.5512         2    16.448
1     Binders      0.8   -5.4870         2     3.540
2      Labels      0.2    4.2717         3    11.784
3     Storage      0.2  -64.7748         3   272.736
4        Art      0.2    4.8840         3    19.536

```

```

...
10189    Binders      0.2   19.7910         3    52.776
10190    Binders      0.2    6.4750         2    20.720
10191   Fasteners      0.2   -0.6048         3     3.024
10192     Phones      0.0    2.7279         7    90.930
10193    Binders      0.2   -0.6048         3     3.024

```

[10194 rows x 19 columns]

```
[13]: store[0:10]
```

```

[13]:      Category      City Country/Region  Customer Name  Manufacturer \
0  Office Supplies    Houston  United States  Darren Powers  Message Book
1  Office Supplies   Naperville  United States  Phillina Ober   GBC
2  Office Supplies   Naperville  United States  Phillina Ober   Avery
3  Office Supplies   Naperville  United States  Phillina Ober   SAFCO
4  Office Supplies  Philadelphia  United States    Mick Brown   Avery
5      Furniture    Henderson  United States  Maria Etezadi   Global
6  Office Supplies    Henderson  United States  Maria Etezadi   Rogers
7  Office Supplies     Athens  United States  Jack O'Briant   Dixon
8  Office Supplies    Henderson  United States  Maria Etezadi   Ibico
9  Office Supplies    Henderson  United States  Maria Etezadi  Alliance

```

```

      Order Date      Order ID Postal Code \
0  03-01-2020  US-2020-103800      77015
1  04-01-2020  US-2020-112326      60540
2  04-01-2020  US-2020-112326      60540
3  04-01-2020  US-2020-112326      60540
4  05-01-2020  US-2020-141817      19143
5  06-01-2020  US-2020-167199      42420
6  06-01-2020  US-2020-167199      42420
7  06-01-2020  US-2020-106054      30605
8  06-01-2020  US-2020-167199      42420
9  06-01-2020  US-2020-167199      42420

```

	Product Name	Region	Segment	\
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	
1	GBC Standard Plastic Binding Systems Combs	Central	Home Office	
2	Avery 508	Central	Home Office	
3	SAFCO Boltless Steel Shelving	Central	Home Office	
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East	Consumer	
5	Global Deluxe High-Back Manager's Chair	South	Home Office	
6	Rogers Handheld Barrel Pencil Sharpener	South	Home Office	
7	Dixon Prang Watercolor Pencils, 10-Color Set w...	South	Corporate	
8	Ibico Hi-Tech Manual Binding System	South	Home Office	
9	Alliance Super-Size Bands, Assorted Sizes	South	Home Office	

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	07-01-2020	Standard Class	Texas	Paper	0.2	5.5512	
1	08-01-2020	Standard Class	Illinois	Binders	0.8	-5.4870	
2	08-01-2020	Standard Class	Illinois	Labels	0.2	4.2717	
3	08-01-2020	Standard Class	Illinois	Storage	0.2	-64.7748	
4	12-01-2020	Standard Class	Pennsylvania	Art	0.2	4.8840	
5	10-01-2020	Standard Class	Kentucky	Chairs	0.0	746.4078	
6	10-01-2020	Standard Class	Kentucky	Art	0.0	1.4796	
7	07-01-2020	First Class	Georgia	Art	0.0	5.2398	
8	10-01-2020	Standard Class	Kentucky	Binders	0.0	274.4910	
9	10-01-2020	Standard Class	Kentucky	Fasteners	0.0	0.3112	

	Quantity	Sales
0	2	16.448
1	2	3.540
2	3	11.784
3	3	272.736
4	3	19.536
5	9	2573.820
6	2	5.480
7	3	12.780
8	2	609.980
9	4	31.120

[14]: store[0:20:5]

[14]:

	Category	City	Country/Region	Customer Name	\
0	Office Supplies	Houston	United States	Darren Powers	
5	Furniture	Henderson	United States	Maria Etezadi	
10	Office Supplies	Henderson	United States	Maria Etezadi	
15	Office Supplies	Huntsville	United States	Vivek Sundaresam	

	Manufacturer	Order Date	Order ID	Postal Code	\
0	Message Book	03-01-2020	US-2020-103800	77015	

5	Global	06-01-2020	US-2020-167199	42420
10	Southworth	06-01-2020	US-2020-167199	42420
15	Acco	07-01-2020	US-2020-105417	77340

	Product Name	Region	Segment	\
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	
5	Global Deluxe High-Back Manager's Chair	South	Home Office	
10	Southworth 25% Cotton Granite Paper & Envelopes	South	Home Office	
15	Acco Four Pocket Poly Ring Binder with Label H...	Central	Consumer	

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	\
0	07-01-2020	Standard Class	Texas	Paper	0.2	
5	10-01-2020	Standard Class	Kentucky	Chairs	0.0	
10	10-01-2020	Standard Class	Kentucky	Paper	0.0	
15	12-01-2020	Standard Class	Texas	Binders	0.8	

	Profit	Quantity	Sales
0	5.5512	2	16.448
5	746.4078	9	2573.820
10	3.0084	1	6.540
15	-18.2525	7	10.430

```
[15]: store.head()
```

```
[15]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
0	Office Supplies	Houston	United States	Darren Powers	Message Book	
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	

	Order Date	Order ID	Postal Code	\
0	03-01-2020	US-2020-103800	77015	
1	04-01-2020	US-2020-112326	60540	
2	04-01-2020	US-2020-112326	60540	
3	04-01-2020	US-2020-112326	60540	
4	05-01-2020	US-2020-141817	19143	

	Product Name	Region	Segment	\
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	
1	GBC Standard Plastic Binding Systems Combs	Central	Home Office	
2	Avery 508	Central	Home Office	
3	SAFCO Boltless Steel Shelving	Central	Home Office	
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East	Consumer	

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	07-01-2020	Standard Class	Texas	Paper	0.2	5.5512	



1	08-01-2020	Standard Class	Illinois	Binders	0.8	-5.4870
2	08-01-2020	Standard Class	Illinois	Labels	0.2	4.2717
3	08-01-2020	Standard Class	Illinois	Storage	0.2	-64.7748
4	12-01-2020	Standard Class	Pennsylvania	Art	0.2	4.8840

	Quantity	Sales
0	2	16.448
1	2	3.540
2	3	11.784
3	3	272.736
4	3	19.536

```
[16]: store.head(3)
```

```
[16]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
0	Office Supplies	Houston	United States	Darren Powers	Message Book	
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	

  

	Order Date	Order ID	Postal Code	\
0	03-01-2020	US-2020-103800	77015	
1	04-01-2020	US-2020-112326	60540	
2	04-01-2020	US-2020-112326	60540	

  

	Product Name	Region	Segment	\
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	
1	GBC Standard Plastic Binding Systems Combs	Central	Home Office	
2	Avery 508	Central	Home Office	

  

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	07-01-2020	Standard Class	Texas	Paper	0.2	5.5512	
1	08-01-2020	Standard Class	Illinois	Binders	0.8	-5.4870	
2	08-01-2020	Standard Class	Illinois	Labels	0.2	4.2717	

  

	Quantity	Sales
0	2	16.448
1	2	3.540
2	3	11.784

```
[17]: store.tail()
```

```
[17]:
```

	Category	City	Country/Region	Customer Name	\
10189	Office Supplies	New York City	United States	Patrick O'Donnell	
10190	Office Supplies	Fairfield	United States	Erica Bern	
10191	Office Supplies	Loveland	United States	Jill Matthias	
10192	Technology	New York City	United States	Patrick O'Donnell	
10193	Office Supplies	Charlottetown	Canada	Harry Olson	

	Manufacturer	Order Date	Order ID	Postal Code	\
10189	Wilson Jones	30-12-2023	US-2023-143259	10009	
10190	GBC	30-12-2023	US-2023-115427	94533	
10191	Other	30-12-2023	US-2023-156720	80538	
10192	Other	30-12-2023	US-2023-143259	10009	
10193	Wilson Jones	30-12-2023	CA-2023-143500	COA	

		Product Name	Region	Segment	Ship Date	\
10189	Wilson Jones	Legal Size Ring Binders	East	Consumer	03-01-2024	
10190		GBC Binding covers	West	Corporate	03-01-2024	
10191		Bagged Rubber Bands	West	Consumer	03-01-2024	
10192		Gear Head AU3700S Headset	East	Consumer	03-01-2024	
10193	Wilson Jones	Impact Binders	East	Consumer	03-01-2024	

	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
10189	Standard Class	New York	Binders	0.2	19.7910	
10190	Standard Class	California	Binders	0.2	6.4750	
10191	Standard Class	Colorado	Fasteners	0.2	-0.6048	
10192	Standard Class	New York	Phones	0.0	2.7279	
10193	Standard Class	Prince Edward Island	Binders	0.2	-0.6048	

	Quantity	Sales
10189	3	52.776
10190	2	20.720
10191	3	3.024
10192	7	90.930
10193	3	3.024

```
[18]: store.isna()
```

```
[18]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
0	False	False	False	False	False	
1	False	False	False	False	False	
2	False	False	False	False	False	
3	False	False	False	False	False	
4	False	False	False	False	False	
...	...	...	...	...	...	
10189	False	False	False	False	False	
10190	False	False	False	False	False	
10191	False	False	False	False	False	
10192	False	False	False	False	False	
10193	False	False	False	False	False	

	Order Date	Order ID	Postal Code	Product Name	Region	Segment	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	

2	False	False	False	False	False	False	False
3	False	False	False	False	False	False	False
4	False	False	False	False	False	False	False
...	...	...	...	...	...	...	...
10189	False	False	False	False	False	False	False
10190	False	False	False	False	False	False	False
10191	False	False	False	False	False	False	False
10192	False	False	False	False	False	False	False
10193	False	False	False	False	False	False	False

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	False	False	False	False	False	False	
1	False	False	False	False	False	False	
2	False	False	False	False	False	False	
3	False	False	False	False	False	False	
4	False	False	False	False	False	False	
...	...	...	...	...	...	...	
10189	False	False	False	False	False	False	
10190	False	False	False	False	False	False	
10191	False	False	False	False	False	False	
10192	False	False	False	False	False	False	
10193	False	False	False	False	False	False	

	Quantity	Sales
0	False	False
1	False	False
2	False	False
3	False	False
4	False	False
...	...	...
10189	False	False
10190	False	False
10191	False	False
10192	False	False
10193	False	False

[10194 rows x 19 columns]

## 1 Introudce statistical concept in pandas ==>

```
[26]: store.describe()
```

```
[26]:
```

	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

```
[31]: store.head()
```

```
[31]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
0	Office Supplies	Houston	United States	Darren Powers	Message Book	
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	

	Order Date	Order ID	Postal Code	\
0	03-01-2020	US-2020-103800	77015	
1	04-01-2020	US-2020-112326	60540	
2	04-01-2020	US-2020-112326	60540	
3	04-01-2020	US-2020-112326	60540	
4	05-01-2020	US-2020-141817	19143	

	Product Name	Region	Segment	\
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	
1	GBC Standard Plastic Binding Systems Combs	Central	Home Office	
2	Avery 508	Central	Home Office	
3	SAFCO Boltless Steel Shelving	Central	Home Office	
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East	Consumer	

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
0	07-01-2020	Standard Class	Texas	Paper	0.2	5.5512	
1	08-01-2020	Standard Class	Illinois	Binders	0.8	-5.4870	
2	08-01-2020	Standard Class	Illinois	Labels	0.2	4.2717	
3	08-01-2020	Standard Class	Illinois	Storage	0.2	-64.7748	
4	12-01-2020	Standard Class	Pennsylvania	Art	0.2	4.8840	

	Quantity	Sales
0	2	16.448
1	2	3.540
2	3	11.784
3	3	272.736
4	3	19.536

```
[32]: store.columns
```

```
[32]: 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')

```

```
[34]: store['Category']
```

```

[34]: 0      Office Supplies
      1      Office Supplies
      2      Office Supplies
      3      Office Supplies
      4      Office Supplies
      ...
     10189 Office Supplies
     10190 Office Supplies
     10191 Office Supplies
     10192      Technology
     10193 Office Supplies
      Name: Category, Length: 10194, dtype: object

```

```
[35]: store[['Category', 'City']]
```

```

[35]:
      Category      City
0      Office Supplies  Houston
1      Office Supplies  Naperville
2      Office Supplies  Naperville
3      Office Supplies  Naperville
4      Office Supplies  Philadelphia
...
     10189 Office Supplies  New York City
     10190 Office Supplies   Fairfield
     10191 Office Supplies   Loveland
     10192      Technology  New York City
     10193 Office Supplies  Charlottetown

[10194 rows x 2 columns]

```

```
[36]: store[['Category', 'City', 'Customer Name']]
```

```

[36]:
      Category      City      Customer Name
0      Office Supplies  Houston  Darren Powers
1      Office Supplies  Naperville  Phillina Ober
2      Office Supplies  Naperville  Phillina Ober
3      Office Supplies  Naperville  Phillina Ober
4      Office Supplies  Philadelphia  Mick Brown
...
     10189 Office Supplies  New York City  Patrick O'Donnell
     10190 Office Supplies   Fairfield   Erica Bern

```

```

10191 Office Supplies      Loveland      Jill Matthias
10192      Technology New York City Patrick O'Donnell
10193 Office Supplies  Charlottetown      Harry Olson

```

[10194 rows x 3 columns]

```
[37]: store.columns
      #store_cat=store
```

```
[37]: 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')
```

```
[38]: store_cat = store[['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']]
```

```
[39]: store.info()
```

```

<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10194 entries, 0 to 10193
Data columns (total 19 columns):
#   Column                Non-Null Count  Dtype
---  -
0   Category              10194 non-null  object
1   City                  10194 non-null  object
2   Country/Region        10194 non-null  object
3   Customer Name         10194 non-null  object
4   Manufacturer          10194 non-null  object
5   Order Date            10194 non-null  object
6   Order ID              10194 non-null  object
7   Postal Code           10194 non-null  object
8   Product Name          10194 non-null  object
9   Region                10194 non-null  object
10  Segment               10194 non-null  object
11  Ship Date             10194 non-null  object
12  Ship Mode             10194 non-null  object
13  State/Province        10194 non-null  object
14  Sub-Category          10194 non-null  object
15  Discount              10194 non-null  float64
16  Profit                10194 non-null  float64
17  Quantity              10194 non-null  int64
18  Sales                 10194 non-null  float64
dtypes: float64(3), int64(1), object(15)

```

```
memory usage: 1.5+ MB
```

```
[40]: store_cat.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 10194 entries, 0 to 10193
Data columns (total 15 columns):
#   Column                                Non-Null Count  Dtype
---  -
0   Category                             10194 non-null  object
1   City                                 10194 non-null  object
2   Country/Region                      10194 non-null  object
3   Customer Name                       10194 non-null  object
4   Manufacturer                        10194 non-null  object
5   Order Date                          10194 non-null  object
6   Order ID                            10194 non-null  object
7   Postal Code                         10194 non-null  object
8   Product Name                        10194 non-null  object
9   Region                              10194 non-null  object
10  Segment                             10194 non-null  object
11  Ship Date                           10194 non-null  object
12  Ship Mode                           10194 non-null  object
13  State/Province                      10194 non-null  object
14  Sub-Category                       10194 non-null  object
dtypes: object(15)
memory usage: 1.2+ MB
```

```
[41]: store.columns
```

```
[41]: 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')
```

```
[ ]: store_num = store[['Discount', 'Profit', 'Quantity',
```

[illegible][illegible]

19

4

15

```
[44]: store_num.describe()
```

```
[44]:
```

	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

```
[45]: rev=store[::-1]  
rev
```

```
[45]:
```

	Category	City	Country/Region	Customer Name \
10193	Office Supplies	Charlottetown	Canada	Harry Olson
10192	Technology	New York City	United States	Patrick O'Donnell
10191	Office Supplies	Loveland	United States	Jill Matthias
10190	Office Supplies	Fairfield	United States	Erica Bern
10189	Office Supplies	New York City	United States	Patrick O'Donnell
...	...	...	...	...
4	Office Supplies	Philadelphia	United States	Mick Brown
3	Office Supplies	Naperville	United States	Phillina Ober
2	Office Supplies	Naperville	United States	Phillina Ober
1	Office Supplies	Naperville	United States	Phillina Ober
0	Office Supplies	Houston	United States	Darren Powers

  

	Manufacturer	Order Date	Order ID	Postal Code \
10193	Wilson Jones	30-12-2023	CA-2023-143500	C0A
10192	Other	30-12-2023	US-2023-143259	10009
10191	Other	30-12-2023	US-2023-156720	80538
10190	GBC	30-12-2023	US-2023-115427	94533
10189	Wilson Jones	30-12-2023	US-2023-143259	10009
...	...	...	...	...
4	Avery	05-01-2020	US-2020-141817	19143
3	SAFCO	04-01-2020	US-2020-112326	60540
2	Avery	04-01-2020	US-2020-112326	60540
1	GBC	04-01-2020	US-2020-112326	60540
0	Message Book	03-01-2020	US-2020-103800	77015

  

	Product Name	Region \
10193	Wilson Jones Impact Binders	East
10192	Gear Head AU3700S Headset	East
10191	Bagged Rubber Bands	West
10190	GBC Binding covers	West
10189	Wilson Jones Legal Size Ring Binders	East



```

...
4 Avery Hi-Liter EverBold Pen Style Fluorescent ... East
3 SAFCO Boltless Steel Shelving Central
2 Avery 508 Central
1 GBC Standard Plastic Binding Systems Combs Central
0 Message Book, Wirebound, Four 5 1/2" X 4" Form... Central

Segment Ship Date Ship Mode State/Province \
10193 Consumer 03-01-2024 Standard Class Prince Edward Island
10192 Consumer 03-01-2024 Standard Class New York
10191 Consumer 03-01-2024 Standard Class Colorado
10190 Corporate 03-01-2024 Standard Class California
10189 Consumer 03-01-2024 Standard Class New York
...
4 Consumer 12-01-2020 Standard Class Pennsylvania
3 Home Office 08-01-2020 Standard Class Illinois
2 Home Office 08-01-2020 Standard Class Illinois
1 Home Office 08-01-2020 Standard Class Illinois
0 Consumer 07-01-2020 Standard Class Texas

Sub-Category Discount Profit Quantity Sales
10193 Binders 0.2 -0.6048 3 3.024
10192 Phones 0.0 2.7279 7 90.930
10191 Fasteners 0.2 -0.6048 3 3.024
10190 Binders 0.2 6.4750 2 20.720
10189 Binders 0.2 19.7910 3 52.776
...
4 Art 0.2 4.8840 3 19.536
3 Storage 0.2 -64.7748 3 272.736
2 Labels 0.2 4.2717 3 11.784
1 Binders 0.8 -5.4870 2 3.540
0 Paper 0.2 5.5512 2 16.448

```

[10194 rows x 19 columns]

```
[46]: rev.head()
```

```

[46]: Category City Country/Region Customer Name \
10193 Office Supplies Charlottetown Canada Harry Olson
10192 Technology New York City United States Patrick O'Donnell
10191 Office Supplies Loveland United States Jill Matthias
10190 Office Supplies Fairfield United States Erica Bern
10189 Office Supplies New York City United States Patrick O'Donnell

Manufacturer Order Date Order ID Postal Code \
10193 Wilson Jones 30-12-2023 CA-2023-143500 COA
10192 Other 30-12-2023 US-2023-143259 10009

```

10191	Other	30-12-2023	US-2023-156720	80538
10190	GBC	30-12-2023	US-2023-115427	94533
10189	Wilson Jones	30-12-2023	US-2023-143259	10009

		Product Name	Region	Segment	Ship Date	\
10193	Wilson Jones	Impact Binders	East	Consumer	03-01-2024	
10192		Gear Head AU3700S Headset	East	Consumer	03-01-2024	
10191		Bagged Rubber Bands	West	Consumer	03-01-2024	
10190		GBC Binding covers	West	Corporate	03-01-2024	
10189	Wilson Jones	Legal Size Ring Binders	East	Consumer	03-01-2024	

	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
10193	Standard Class	Prince Edward Island	Binders	0.2	-0.6048	
10192	Standard Class	New York	Phones	0.0	2.7279	
10191	Standard Class	Colorado	Fasteners	0.2	-0.6048	
10190	Standard Class	California	Binders	0.2	6.4750	
10189	Standard Class	New York	Binders	0.2	19.7910	

	Quantity	Sales
10193	3	3.024
10192	7	90.930
10191	3	3.024
10190	2	20.720
10189	3	52.776

```
[47]: rev.tail()
```

```
[47]:
```

	Category	City	Country/Region	Customer Name	Manufacturer	\
4	Office Supplies	Philadelphia	United States	Mick Brown	Avery	
3	Office Supplies	Naperville	United States	Phillina Ober	SAFCO	
2	Office Supplies	Naperville	United States	Phillina Ober	Avery	
1	Office Supplies	Naperville	United States	Phillina Ober	GBC	
0	Office Supplies	Houston	United States	Darren Powers	Message Book	

	Order Date	Order ID	Postal Code	\
4	05-01-2020	US-2020-141817	19143	
3	04-01-2020	US-2020-112326	60540	
2	04-01-2020	US-2020-112326	60540	
1	04-01-2020	US-2020-112326	60540	
0	03-01-2020	US-2020-103800	77015	

	Product Name	Region	Segment	\
4	Avery Hi-Liter EverBold Pen Style Fluorescent ...	East	Consumer	
3	SAFCO Boltless Steel Shelving	Central	Home Office	
2	Avery 508	Central	Home Office	
1	GBC Standard Plastic Binding Systems Combs	Central	Home Office	
0	Message Book, Wirebound, Four 5 1/2" X 4" Form...	Central	Consumer	

	Ship Date	Ship Mode	State/Province	Sub-Category	Discount	Profit	\
4	12-01-2020	Standard Class	Pennsylvania	Art	0.2	4.8840	
3	08-01-2020	Standard Class	Illinois	Storage	0.2	-64.7748	
2	08-01-2020	Standard Class	Illinois	Labels	0.2	4.2717	
1	08-01-2020	Standard Class	Illinois	Binders	0.8	-5.4870	
0	07-01-2020	Standard Class	Texas	Paper	0.2	5.5512	

	Quantity	Sales
4	3	19.536
3	3	272.736
2	3	11.784
1	2	3.540
0	2	16.448

[ ]: