

```

import pandas as pd
import plotly.express as px
import plotly.graph_objects as go
import plotly.io as pio
import plotly.colors as colors
pio.templates.default = "plotly_white"

```

```
data = pd.read_csv("Sample - Superstore.csv", encoding = 'latin-1')
```

```
data
```

	Row ID	Order ID	Order Date	Ship Date	Ship
Mode \					
0	1	CA-2016-152156	11/8/2016	11/11/2016	Second Class
1	2	CA-2016-152156	11/8/2016	11/11/2016	Second Class
2	3	CA-2016-138688	6/12/2016	6/16/2016	Second Class
3	4	US-2015-108966	10/11/2015	10/18/2015	Standard Class
4	5	US-2015-108966	10/11/2015	10/18/2015	Standard Class
...	...	...	...	...	...
9989	9990	CA-2014-110422	1/21/2014	1/23/2014	Second Class
9990	9991	CA-2017-121258	2/26/2017	3/3/2017	Standard Class
9991	9992	CA-2017-121258	2/26/2017	3/3/2017	Standard Class
9992	9993	CA-2017-121258	2/26/2017	3/3/2017	Standard Class
9993	9994	CA-2017-119914	5/4/2017	5/9/2017	Second Class

	Customer ID	Customer Name	Segment	Country
City \				
0	CG-12520	Claire Gute	Consumer	United States
Henderson				
1	CG-12520	Claire Gute	Consumer	United States
Henderson				
2	DV-13045	Darrin Van Huff	Corporate	United States
Los Angeles				
3	S0-20335	Sean O'Donnell	Consumer	United States
Fort Lauderdale				
4	S0-20335	Sean O'Donnell	Consumer	United States
Fort Lauderdale				
...	...	...	...	...
...				
9989	TB-21400	Tom Boeckenhauer	Consumer	United States

Miami					
9990	DB-13060	Dave Brooks	Consumer	United States	
Costa Mesa					
9991	DB-13060	Dave Brooks	Consumer	United States	
Costa Mesa					
9992	DB-13060	Dave Brooks	Consumer	United States	
Costa Mesa					
9993	CC-12220	Chris Cortes	Consumer	United States	
Westminster					

	...	Postal Code	Region	Product ID	Category Sub-
Category \					
0	...	42420	South	FUR-B0-10001798	Furniture
Bookcases					
1	...	42420	South	FUR-CH-10000454	Furniture
Chairs					
2	...	90036	West	OFF-LA-10000240	Office Supplies
Labels					
3	...	33311	South	FUR-TA-10000577	Furniture
Tables					
4	...	33311	South	OFF-ST-10000760	Office Supplies
Storage					
...	...	...	...	...	...
...					
9989	...	33180	South	FUR-FU-10001889	Furniture
Furnishings					
9990	...	92627	West	FUR-FU-10000747	Furniture
Furnishings					
9991	...	92627	West	TEC-PH-10003645	Technology
Phones					
9992	...	92627	West	OFF-PA-10004041	Office Supplies
Paper					
9993	...	92683	West	OFF-AP-10002684	Office Supplies
Appliances					

	Product Name	Sales
Quantity \		
0	Bush Somerset Collection Bookcase	261.9600
2		
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400
3		
2	Self-Adhesive Address Labels for Typewriters b...	14.6200
2		
3	Bretford CR4500 Series Slim Rectangular Table	957.5775
5		
4	Eldon Fold 'N Roll Cart System	22.3680
2		
...	...	...
...		

9989	Ultra Door Pull Handle	25.2480
3		
9990	Tenex B1-RE Series Chair Mats for Low Pile Car...	91.9600
2		
9991	Aastra 57i VoIP phone	258.5760
2		
9992	It's Hot Message Books with Stickers, 2 3/4" x 5"	29.6000
4		
9993	Acco 7-Outlet Masterpiece Power Center, Wihtou...	243.1600
2		

	Discount	Profit
0	0.00	41.9136
1	0.00	219.5820
2	0.00	6.8714
3	0.45	-383.0310
4	0.20	2.5164
...	...	...
9989	0.20	4.1028
9990	0.00	15.6332
9991	0.20	19.3932
9992	0.00	13.3200
9993	0.00	72.9480

[9994 rows x 21 columns]

data.head()

Row ID	Order ID	Order Date	Ship Date	Ship Mode
Customer ID \				
0 1	CA-2016-152156	11/8/2016	11/11/2016	Second Class
CG-12520				
1 2	CA-2016-152156	11/8/2016	11/11/2016	Second Class
CG-12520				
2 3	CA-2016-138688	6/12/2016	6/16/2016	Second Class
DV-13045				
3 4	US-2015-108966	10/11/2015	10/18/2015	Standard Class
S0-20335				
4 5	US-2015-108966	10/11/2015	10/18/2015	Standard Class
S0-20335				

Customer Name	Segment	Country	City	...	\
0 Claire Gute	Consumer	United States	Henderson	...	
1 Claire Gute	Consumer	United States	Henderson	...	
2 Darrin Van Huff	Corporate	United States	Los Angeles	...	
3 Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	
4 Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	

Postal Code	Region	Product ID	Category Sub-
Category \			

0	42420	South	FUR-B0-10001798	Furniture	Bookcases
1	42420	South	FUR-CH-10000454	Furniture	Chairs
2	90036	West	OFF-LA-10000240	Office Supplies	Labels
3	33311	South	FUR-TA-10000577	Furniture	Tables
4	33311	South	OFF-ST-10000760	Office Supplies	Storage

		Product Name	Sales
Quantity \			
0		Bush Somerset Collection Bookcase	261.9600
2			
1		Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400
3			
2		Self-Adhesive Address Labels for Typewriters b...	14.6200
2			
3		Bretford CR4500 Series Slim Rectangular Table	957.5775
5			
4		Eldon Fold 'N Roll Cart System	22.3680
2			

	Discount	Profit
0	0.00	41.9136
1	0.00	219.5820
2	0.00	6.8714
3	0.45	-383.0310
4	0.20	2.5164

[5 rows x 21 columns]

data.describe()

	Row ID	Postal Code	Sales	Quantity
Discount \				
count	9994.000000	9994.000000	9994.000000	9994.000000
9994.000000				
mean	4997.500000	55190.379428	229.858001	3.789574
0.156203				
std	2885.163629	32063.693350	623.245101	2.225110
0.206452				
min	1.000000	1040.000000	0.444000	1.000000
0.000000				
25%	2499.250000	23223.000000	17.280000	2.000000
0.000000				
50%	4997.500000	56430.500000	54.490000	3.000000
0.200000				
75%	7495.750000	90008.000000	209.940000	5.000000

```
0.200000
max      9994.000000   99301.000000   22638.480000   14.000000
0.800000
```

```
      Profit
count  9994.000000
mean    28.656896
std     234.260108
min    -6599.978000
25%      1.728750
50%      8.666500
75%     29.364000
max     8399.976000
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 9994 entries, 0 to 9993
Data columns (total 21 columns):
 #   Column                Non-Null Count  Dtype
---  -
 0   Row ID                9994 non-null   int64
 1   Order ID              9994 non-null   object
 2   Order Date            9994 non-null   object
 3   Ship Date             9994 non-null   object
 4   Ship Mode             9994 non-null   object
 5   Customer ID           9994 non-null   object
 6   Customer Name         9994 non-null   object
 7   Segment              9994 non-null   object
 8   Country               9994 non-null   object
 9   City                 9994 non-null   object
10   State                9994 non-null   object
11   Postal Code          9994 non-null   int64
12   Region              9994 non-null   object
13   Product ID           9994 non-null   object
14   Category             9994 non-null   object
15   Sub-Category         9994 non-null   object
16   Product Name         9994 non-null   object
17   Sales                9994 non-null   float64
18   Quantity             9994 non-null   int64
19   Discount             9994 non-null   float64
20   Profit               9994 non-null   float64
dtypes: float64(3), int64(3), object(15)
memory usage: 1.6+ MB
```

## converting date columns

```
data['Order Date'] = pd.to_datetime(data['Order Date'])
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 9994 entries, 0 to 9993
```

```
Data columns (total 21 columns):
```

#	Column	Non-Null Count	Dtype
0	Row ID	9994 non-null	int64
1	Order ID	9994 non-null	object
2	Order Date	9994 non-null	datetime64[ns]
3	Ship Date	9994 non-null	object
4	Ship Mode	9994 non-null	object
5	Customer ID	9994 non-null	object
6	Customer Name	9994 non-null	object
7	Segment	9994 non-null	object
8	Country	9994 non-null	object
9	City	9994 non-null	object
10	State	9994 non-null	object
11	Postal Code	9994 non-null	int64
12	Region	9994 non-null	object
13	Product ID	9994 non-null	object
14	Category	9994 non-null	object
15	Sub-Category	9994 non-null	object
16	Product Name	9994 non-null	object
17	Sales	9994 non-null	float64
18	Quantity	9994 non-null	int64
19	Discount	9994 non-null	float64
20	Profit	9994 non-null	float64

```
dtypes: datetime64[ns](1), float64(3), int64(3), object(14)
```

```
memory usage: 1.6+ MB
```

```
data['Ship Date'] = pd.to_datetime(data['Order Date'])
```

```
data.info()
```

```
<class 'pandas.core.frame.DataFrame'>
```

```
RangeIndex: 9994 entries, 0 to 9993
```

```
Data columns (total 21 columns):
```

#	Column	Non-Null Count	Dtype
0	Row ID	9994 non-null	int64
1	Order ID	9994 non-null	object
2	Order Date	9994 non-null	datetime64[ns]
3	Ship Date	9994 non-null	datetime64[ns]
4	Ship Mode	9994 non-null	object
5	Customer ID	9994 non-null	object
6	Customer Name	9994 non-null	object
7	Segment	9994 non-null	object
8	Country	9994 non-null	object
9	City	9994 non-null	object

```

10 State          9994 non-null object
11 Postal Code    9994 non-null int64
12 Region         9994 non-null object
13 Product ID     9994 non-null object
14 Category       9994 non-null object
15 Sub-Category   9994 non-null object
16 Product Name   9994 non-null object
17 Sales          9994 non-null float64
18 Quantity       9994 non-null int64
19 Discount       9994 non-null float64
20 Profit         9994 non-null float64

```

dtypes: datetime64[ns](2), float64(3), int64(3), object(13)

memory usage: 1.6+ MB

data.head()

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	
Customer ID \						
0	1	CA-2016-152156	2016-11-08	2016-11-08	Second Class	CG-12520
1	2	CA-2016-152156	2016-11-08	2016-11-08	Second Class	CG-12520
2	3	CA-2016-138688	2016-06-12	2016-06-12	Second Class	DV-13045
3	4	US-2015-108966	2015-10-11	2015-10-11	Standard Class	S0-20335
4	5	US-2015-108966	2015-10-11	2015-10-11	Standard Class	S0-20335

	Customer Name	Segment	Country	City	...	\
0	Claire Gute	Consumer	United States	Henderson	...	
1	Claire Gute	Consumer	United States	Henderson	...	
2	Darrin Van Huff	Corporate	United States	Los Angeles	...	
3	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	
4	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	

	Postal Code	Region	Product ID	Category	Sub-
Category \					
0	42420	South	FUR-B0-10001798	Furniture	Bookcases
1	42420	South	FUR-CH-10000454	Furniture	Chairs
2	90036	West	OFF-LA-10000240	Office Supplies	Labels
3	33311	South	FUR-TA-10000577	Furniture	Tables
4	33311	South	OFF-ST-10000760	Office Supplies	Storage

Product Name Sales

```

Quantity \
0          Bush Somerset Collection Bookcase  261.9600
2
1 Hon Deluxe Fabric Upholstered Stacking Chairs,...  731.9400
3
2 Self-Adhesive Address Labels for Typewriters b...  14.6200
2
3      Bretford CR4500 Series Slim Rectangular Table  957.5775
5
4          Eldon Fold 'N Roll Cart System  22.3680
2

```

```

Discount  Profit
0      0.00  41.9136
1      0.00  219.5820
2      0.00   6.8714
3      0.45 -383.0310
4      0.20   2.5164

```

[5 rows x 21 columns]

```

data['Order Month'] = data['Order Date'].dt.month
data['Order Year'] = data['Order Date'].dt.year
data['Order Day of Week'] = data['Order Date'].dt.dayofweek

```

data.head()

```

Row ID      Order ID Order Date  Ship Date      Ship Mode
Customer ID \
0      1  CA-2016-152156  2016-11-08  2016-11-08      Second Class  CG-
12520
1      2  CA-2016-152156  2016-11-08  2016-11-08      Second Class  CG-
12520
2      3  CA-2016-138688  2016-06-12  2016-06-12      Second Class  DV-
13045
3      4  US-2015-108966  2015-10-11  2015-10-11      Standard Class  SO-
20335
4      5  US-2015-108966  2015-10-11  2015-10-11      Standard Class  SO-
20335

```

```

Customer Name  Segment      Country      City  ... \
0  Claire Gute  Consumer  United States  Henderson  ...
1  Claire Gute  Consumer  United States  Henderson  ...
2  Darrin Van Huff  Corporate  United States  Los Angeles  ...
3  Sean O'Donnell  Consumer  United States  Fort Lauderdale  ...
4  Sean O'Donnell  Consumer  United States  Fort Lauderdale  ...

```

```

Category  Sub-Category \
0  Furniture  Bookcases
1  Furniture  Chairs

```



2	Office Supplies	Labels
3	Furniture	Tables
4	Office Supplies	Storage

	Product Name	Sales
Quantity \		
0	Bush Somerset Collection Bookcase	261.9600
2		
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400
3		
2	Self-Adhesive Address Labels for Typewriters b...	14.6200
2		
3	Bretford CR4500 Series Slim Rectangular Table	957.5775
5		
4	Eldon Fold 'N Roll Cart System	22.3680
2		

	Discount	Profit	Order Month	Order Year	Order Day of Week
0	0.00	41.9136	11	2016	1
1	0.00	219.5820	11	2016	1
2	0.00	6.8714	6	2016	6
3	0.45	-383.0310	10	2015	6
4	0.20	2.5164	10	2015	6

[5 rows x 24 columns]

you need to calculate the monthly sales of the store and identify which month had the highest sales and which month had the lowest sales.

## Monthly Sales Analysis

```
sales_by_month = data.groupby('Order Month')
['Sales'].sum().reset_index();
```

sales\_by\_month

	Order Month	Sales
0	1	94924.8356
1	2	59751.2514
2	3	205005.4888
3	4	137762.1286
4	5	155028.8117
5	6	152718.6793

6	7	147238.0970
7	8	159044.0630
8	9	307649.9457
9	10	200322.9847
10	11	352461.0710
11	12	325293.5035

```
import plotly.express as px
fig = px.line(sales_by_month,
              x='Order Month',
              y='Sales',
              title='Monthly Sales Analysis')
fig.show()
```



```
data.head()
```

Row ID	Order ID	Order Date	Ship Date	Ship Mode
0	1	CA-2016-152156	2016-11-08	2016-11-08
1	2	CA-2016-152156	2016-11-08	2016-11-08
2	3	CA-2016-138688	2016-06-12	2016-06-12
3	4	US-2015-108966	2015-10-11	2015-10-11
4	5	US-2015-108966	2015-10-11	2015-10-11

Customer ID	Customer Name	Segment	Country	City
0	Claire Gute	Consumer	United States	Henderson
1	Claire Gute	Consumer	United States	Henderson
2	Darrin Van Huff	Corporate	United States	Los Angeles
3	Sean O'Donnell	Consumer	United States	Fort Lauderdale
4	Sean O'Donnell	Consumer	United States	Fort Lauderdale

Category	Sub-Category

0	Furniture	Bookcases
1	Furniture	Chairs
2	Office Supplies	Labels
3	Furniture	Tables
4	Office Supplies	Storage

Quantity \	Product Name	Sales
0	Bush Somerset Collection Bookcase	261.9600
2		
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400
3		
2	Self-Adhesive Address Labels for Typewriters b...	14.6200
2		
3	Bretford CR4500 Series Slim Rectangular Table	957.5775
5		
4	Eldon Fold 'N Roll Cart System	22.3680
2		

	Discount	Profit	Order Month	Order Year	Order Day of Week
0	0.00	41.9136	11	2016	1
1	0.00	219.5820	11	2016	1
2	0.00	6.8714	6	2016	6
3	0.45	-383.0310	10	2015	6
4	0.20	2.5164	10	2015	6

[5 rows x 24 columns]

## Sales by category

```
sales_by_category = data.groupby(['Category'])
['Sales'].sum().reset_index()
```

```
sales_by_category
```

	Category	Sales
0	Furniture	741999.7953
1	Office Supplies	719047.0320
2	Technology	836154.0330

```
fig = px.pie(sales_by_category,
             values='Sales',
             names='Category',
             hole= 0.4 ,
             color_discrete_sequence = px.colors.qualitative.Pastel)
fig.update_traces(textposition = 'inside', textinfo = 'percent+label')
fig.update_layout(title_text = 'Sales Analysis by Category',
                  title_font = dict(size=24))
```

```
fig.show()
```

Sales Analysis by Category



```
data.head()
```

Row ID	Customer ID \	Order ID	Order Date	Ship Date	Ship Mode	
0	1	CA-2016-152156	2016-11-08	2016-11-08	Second Class	CG-12520
1	2	CA-2016-152156	2016-11-08	2016-11-08	Second Class	CG-12520
2	3	CA-2016-138688	2016-06-12	2016-06-12	Second Class	DV-13045
3	4	US-2015-108966	2015-10-11	2015-10-11	Standard Class	SO-20335
4	5	US-2015-108966	2015-10-11	2015-10-11	Standard Class	SO-20335

	Customer Name	Segment	Country	City	...	\
0	Claire Gute	Consumer	United States	Henderson	...	
1	Claire Gute	Consumer	United States	Henderson	...	
2	Darrin Van Huff	Corporate	United States	Los Angeles	...	
3	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	
4	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	

	Category	Sub-Category	\
0	Furniture	Bookcases	
1	Furniture	Chairs	
2	Office Supplies	Labels	
3	Furniture	Tables	
4	Office Supplies	Storage	

	Product Name	Sales
Quantity \		
0	Bush Somerset Collection Bookcase	261.9600
2		
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400

```

3
2 Self-Adhesive Address Labels for Typewriters b... 14.6200
2
3 Bretford CR4500 Series Slim Rectangular Table 957.5775
5
4 Eldon Fold 'N Roll Cart System 22.3680
2

Discount Profit Order Month Order Year Order Day of Week
0 0.00 41.9136 11 2016 1
1 0.00 219.5820 11 2016 1
2 0.00 6.8714 6 2016 6
3 0.45 -383.0310 10 2015 6
4 0.20 2.5164 10 2015 6

[5 rows x 24 columns]

```

## Sales Analysis by Sub category

```

sales_by_subcategory = data.groupby('Sub-Category')
['Sales'].sum().reset_index()

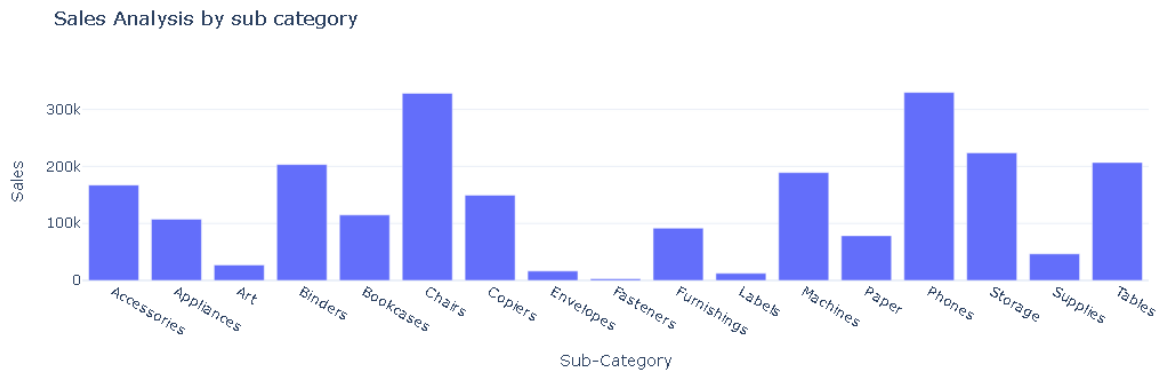
sales_by_subcategory

Sub-Category Sales
0 Accessories 167380.3180
1 Appliances 107532.1610
2 Art 27118.7920
3 Binders 203412.7330
4 Bookcases 114879.9963
5 Chairs 328449.1030
6 Copiers 149528.0300
7 Envelopes 16476.4020
8 Fasteners 3024.2800
9 Furnishings 91705.1640
10 Labels 12486.3120
11 Machines 189238.6310
12 Paper 78479.2060
13 Phones 330007.0540
14 Storage 223843.6080
15 Supplies 46673.5380
16 Tables 206965.5320

fig = px.bar(sales_by_subcategory, x='Sub-Category', y='Sales',
title= "Sales Analysis by sub category")

fig.show()

```



## Monthly profit analysis

```
data.head()
```

Row ID	Order ID	Order Date	Ship Date	Ship Mode	
Customer ID \					
0	1	CA-2016-152156	2016-11-08	2016-11-08	Second Class CG-
1	2	CA-2016-152156	2016-11-08	2016-11-08	Second Class CG-
2	3	CA-2016-138688	2016-06-12	2016-06-12	Second Class DV-
3	4	US-2015-108966	2015-10-11	2015-10-11	Standard Class SO-
4	5	US-2015-108966	2015-10-11	2015-10-11	Standard Class SO-

	Customer Name	Segment	Country	City	...	\
0	Claire Gute	Consumer	United States	Henderson	...	
1	Claire Gute	Consumer	United States	Henderson	...	
2	Darrin Van Huff	Corporate	United States	Los Angeles	...	
3	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	
4	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	

	Category	Sub-Category	\
0	Furniture	Bookcases	
1	Furniture	Chairs	
2	Office Supplies	Labels	
3	Furniture	Tables	
4	Office Supplies	Storage	

	Product Name	Sales
Quantity \		
0	Bush Somerset Collection Bookcase	261.9600
2		
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400

```

3
2 Self-Adhesive Address Labels for Typewriters b... 14.6200
2
3 Bretford CR4500 Series Slim Rectangular Table 957.5775
5
4 Eldon Fold 'N Roll Cart System 22.3680
2

```

	Discount	Profit	Order Month	Order Year	Order Day of Week
0	0.00	41.9136	11	2016	1
1	0.00	219.5820	11	2016	1
2	0.00	6.8714	6	2016	6
3	0.45	-383.0310	10	2015	6
4	0.20	2.5164	10	2015	6

[5 rows x 24 columns]

```

profit_by_month = data.groupby('Order Month')
['Profit'].sum().reset_index()

```

profit\_by\_month

	Order Month	Profit
0	1	9134.4461
1	2	10294.6107
2	3	28594.6872
3	4	11587.4363
4	5	22411.3078
5	6	21285.7954
6	7	13832.6648
7	8	21776.9384
8	9	36857.4753
9	10	31784.0413
10	11	35468.4265
11	12	43369.1919

```

fig = px.line(profit_by_month, x='Order Month', y= 'Profit',
title='Monthly profit analysis')

```

```
fig.show()
```



## profit by category

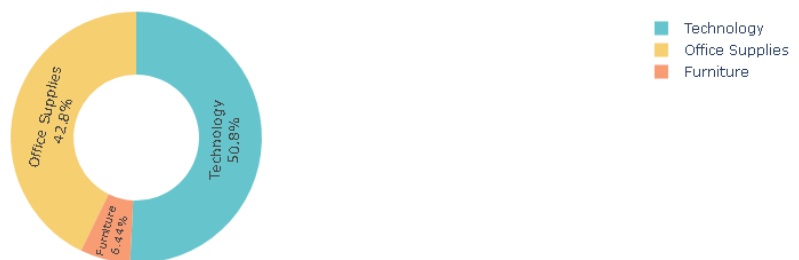
```
profit_by_category = data.groupby('Category')  
['Profit'].sum().reset_index()
```

profit\_by\_category

	Category	Profit
0	Furniture	18451.2728
1	Office Supplies	122490.8008
2	Technology	145454.9481

```
fig=px.pie(profit_by_category,  
            values='Profit',  
            names='Category',  
            hole=0.5,  
            color_discrete_sequence=px.colors.qualitative.Pastel)  
  
fig.update_traces(textposition='inside', textinfo='percent+label')  
fig.update_layout(title_text='Profit Analysis by Category',  
                  title_font=dict(size=24))  
  
fig.show()
```

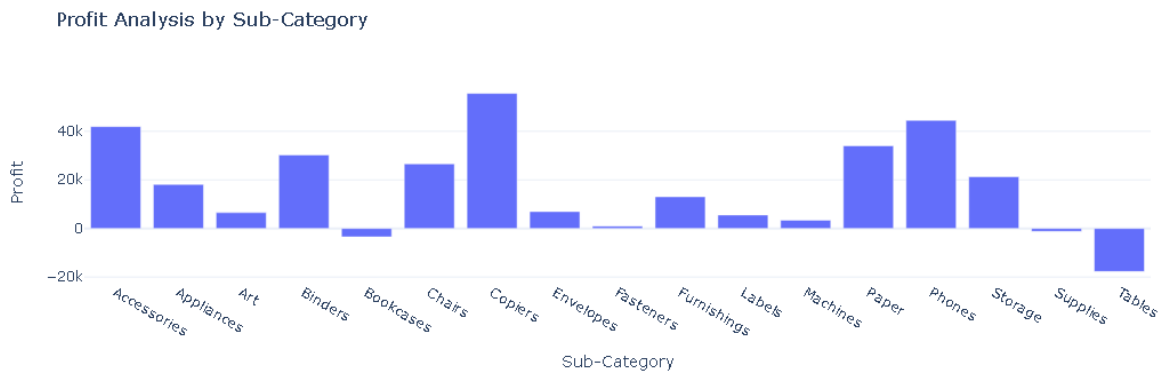
Profit Analysis by Category





## profit by sub-category

```
profit_by_subcategory = data.groupby('Sub-Category')
['Profit'].sum().reset_index()
fig= px.bar(profit_by_subcategory, x='Sub-Category', y='Profit',
            title='Profit Analysis by Sub-Category')
fig.show()
```



## sales and profit - customer segment

```
data.head()
```

Row ID	Order ID	Order Date	Ship Date	Ship Mode	
Customer ID \					
0	1	CA-2016-152156	2016-11-08	2016-11-08	Second Class CG-
1	2	CA-2016-152156	2016-11-08	2016-11-08	Second Class CG-
2	3	CA-2016-138688	2016-06-12	2016-06-12	Second Class DV-
3	4	US-2015-108966	2015-10-11	2015-10-11	Standard Class S0-
4	5	US-2015-108966	2015-10-11	2015-10-11	Standard Class S0-

	Customer Name	Segment	Country	City	...	\
0	Claire Gute	Consumer	United States	Henderson	...	
1	Claire Gute	Consumer	United States	Henderson	...	
2	Darrin Van Huff	Corporate	United States	Los Angeles	...	
3	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	
4	Sean O'Donnell	Consumer	United States	Fort Lauderdale	...	

	Category	Sub-Category	\
0	Furniture	Bookcases	
1	Furniture	Chairs	

2	Office Supplies	Labels
3	Furniture	Tables
4	Office Supplies	Storage

	Product Name	Sales
0	Bush Somerset Collection Bookcase	261.9600
1	Hon Deluxe Fabric Upholstered Stacking Chairs,...	731.9400
2	Self-Adhesive Address Labels for Typewriters b...	14.6200
3	Bretford CR4500 Series Slim Rectangular Table	957.5775
4	Eldon Fold 'N Roll Cart System	22.3680

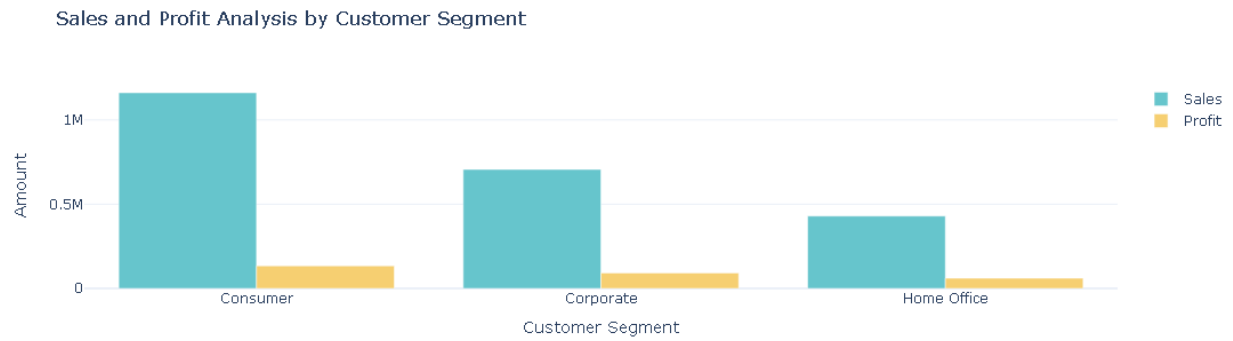
	Discount	Profit	Order Month	Order Year	Order Day of Week
0	0.00	41.9136	11	2016	1
1	0.00	219.5820	11	2016	1
2	0.00	6.8714	6	2016	6
3	0.45	-383.0310	10	2015	6
4	0.20	2.5164	10	2015	6

[5 rows x 24 columns]

```
sales_profit_by_segment = data.groupby('Segment').agg({'Sales': 'sum',
'Profit': 'sum'}).reset_index()
```

```
color_palette = colors.qualitative.Pastel
```

```
fig = go.Figure()
fig.add_trace(go.Bar(x=sales_profit_by_segment['Segment'],
y=sales_profit_by_segment['Sales'],
name='Sales',
marker_color = color_palette[0]))
fig.add_trace(go.Bar(x=sales_profit_by_segment['Segment'],
y=sales_profit_by_segment['Profit'],
name='Profit',
marker_color= color_palette[1]))
fig.update_layout(title='Sales and Profit Analysis by Customer
Segment',
xaxis_title='Customer Segment', yaxis_title =
'Amount')
fig.show()
```



## sales to profit ratio

```
sales_profit_by_segment = data.groupby('Segment').agg({'Sales': 'sum',  
'Profit': 'sum'}).reset_index()  
sales_profit_by_segment['Sales_to_Profit_Ratio'] =  
sales_profit_by_segment['Sales'] / sales_profit_by_segment['Profit']  
print(sales_profit_by_segment[['Segment', 'Sales_to_Profit_Ratio']])
```

	Segment	Sales_to_Profit_Ratio
0	Consumer	8.659471
1	Corporate	7.677245
2	Home Office	7.125416