

```

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

```

Mode	Row	ID	Order ID	Order Date	Ship Date	Ship
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

City	Customer ID	Customer Name	Segment	Country
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
Angeles				Los
3	S0-20335	Sean O'Donnell	Consumer	United States
Lauderdale				Fort
4	S0-20335	Sean O'Donnell	Consumer	United States
Lauderdale				Fort
...
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					

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

Quantity	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
5
...

```
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

```

Quantity \	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
0	41.9136
1	219.5820
2	6.8714
3	-383.0310
4	2.5164

[5 rows x 21 columns]

data.describe()

Row ID	Postal Code	Sales	Quantity
count	9994.000000	9994.000000	9994.000000
mean	4997.500000	55190.379428	229.858001
std	2885.163629	32063.693350	623.245101
min	1.000000	1040.000000	0.444000
25%	2499.250000	23223.000000	17.280000
50%	4997.500000	56430.500000	54.490000
75%	7495.750000	90008.000000	209.940000

```

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	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	...	

	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
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]

```

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      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 Self-Adhesive Address Labels for Typewriters b... 14.6200
2
2 Bretford CR4500 Series Slim Rectangular Table 957.5775
3
5 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

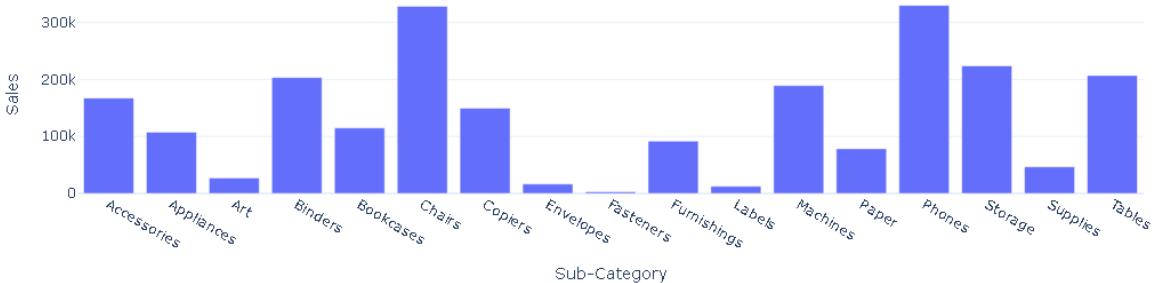
   Sub-Category    Sales
0  Accessories  167380.3180
1  Appliances  107532.1610
2      Art     27118.7920
3    Binders  203412.7330
4  Bookcases  114879.9963
5     Chairs  328449.1030
6    Copiers  149528.0300
7  Envelopes  16476.4020
8  Fasteners  3024.2800
9  Furnishings  91705.1640
10    Labels  12486.3120
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()

```

Sales Analysis by sub category



Monthly profit analysis

```
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   Self-Adhesive Address Labels for Typewriters b... 14.6200
2
2   Bretford CR4500 Series Slim Rectangular Table  957.5775
3
5   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()

```

Monthly profit analysis



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))

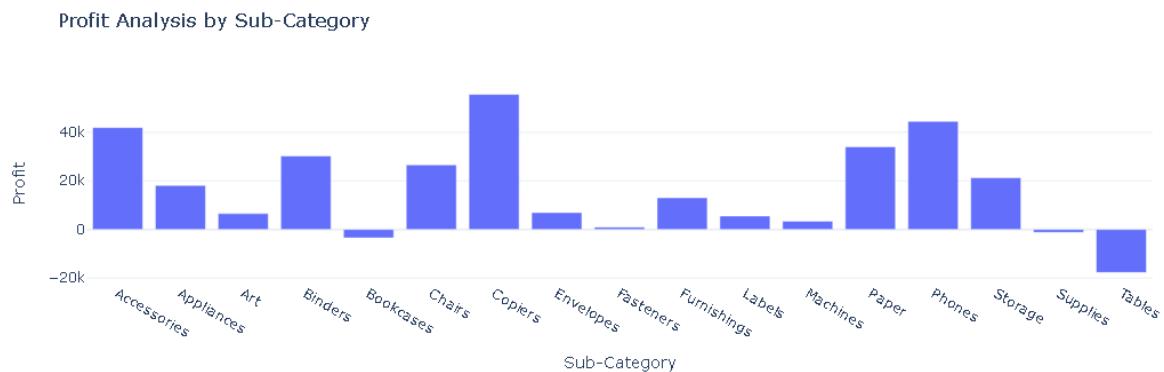
fig.show()
```

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

	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]

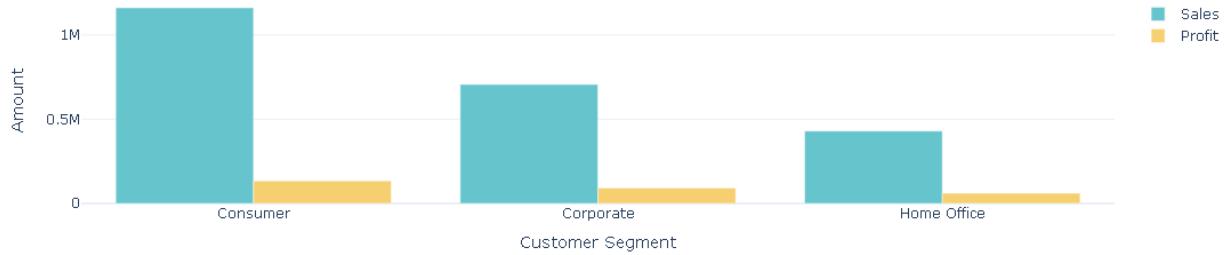
sales_profit_by_segment = data.groupby('Segment').agg({'Sales': 'sum',
'Profit': 'sum'}).reset_index()

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 and Profit Analysis by Customer Segment



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
```