```
import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

```
data = pd.read_csv("/content/Super_International_Market.csv", encoding='latin1')
```

```
df= data.copy()
```

```
df.head(3)
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	...	Product ID	Category	S Categ
0	32298	CA-2012-124891	31-07-2012	31-07-2012	Same Day	RH-19495	Rick Hansen	Consumer	New York City	New York	...	TEC-AC-10003033	Technology	Access
1	26341	IN-2013-77878	2/5/2013	5/2/2013	Second Class	JR-16210	Justin Ritter	Corporate	Wollongong	New South Wales	...	FUR-CH-10003950	Furniture	Cl
2	25330	IN-2013-71249	17-10-2013	17-10-2013	First Class	CR-12730	Craig Reiter	Consumer	Brisbane	Queensland	...	TEC-PH-10004664	Technology	Ph

3 rows × 24 columns

Data Integrity:

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51290 entries, 0 to 51289
Data columns (total 24 columns):
 #   Column          Non-Null Count  Dtype  
---  ------          --------------  -----  
 0   Row ID          51290 non-null  int64  
 1   Order ID        51290 non-null  object 
 2   Order Date      51290 non-null  object 
 3   Ship Date       51290 non-null  object 
 4   Ship Mode       51290 non-null  object 
 5   Customer ID     51290 non-null  object 
 6   Customer Name   51290 non-null  object 
 7   Segment         51290 non-null  object 
 8   City            51290 non-null  object 
 9   State           51290 non-null  object 
 10  Country         51290 non-null  object 
 11  Postal Code     9994 non-null   float64
 12  Market          51290 non-null  object 
 13  Region          51290 non-null  object 
 14  Product ID      51290 non-null  object 
 15  Category        51290 non-null  object 
 16  Sub-Category    51290 non-null  object 
 17  Product Name    51290 non-null  object 
 18  Sales           51290 non-null  float64
 19  Quantity        51290 non-null  int64  
 20  Discount        51290 non-null  float64
 21  Profit          51290 non-null  float64
 22  Shipping Cost   51290 non-null  float64
 23  Order Priority  51290 non-null  object 
dtypes: float64(5), int64(2), object(17)
memory usage: 9.4+ MB
```

```
df.shape
```

```
(51290, 24)
```

```
df.describe()
```

	Row ID	Postal Code	Sales	Quantity	Discount	Profit	Shipping Cost
count	51290.00000	9994.000000	51290.000000	51290.000000	51290.000000	51290.000000	51290.000000
mean	25645.50000	55190.379428	246.490581	3.476545	0.142908	28.610982	26.375915
std	14806.29199	32063.693350	487.565361	2.278766	0.212280	174.340972	57.296804
min	1.00000	1040.000000	0.444000	1.000000	0.000000	-6599.978000	0.000000
25%	12823.25000	23223.000000	30.758625	2.000000	0.000000	0.000000	2.610000
50%	25645.50000	56430.500000	85.053000	3.000000	0.000000	9.240000	7.790000
75%	38467.75000	90008.000000	251.053200	5.000000	0.200000	36.810000	24.450000
max	51290.00000	99301.000000	22638.480000	14.000000	0.850000	8399.976000	933.570000

```
df.describe(include = 'all')
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	...	Product ID	Category	S Categ
count	51290.00000	51290	51290	51290	51290	51290	51290	51290	51290	51290	...	51290	51290	51
unique	NaN	25035	1430	1430	4	1590	795	3	3636	1094	...	10292	3	
top	NaN	CA-2014-100111	18-06-2014	18-06-2014	Standard Class	PO-18850	Muhammed Yedwab	Consumer	New York City	California	...	OFF-AR-10003651	Office Supplies	Bin
freq	NaN	14	135	135	30775	97	108	26518	915	2001	...	35	31273	6
mean	25645.50000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
std	14806.29199	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
min	1.00000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
25%	12823.25000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
50%	25645.50000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
75%	38467.75000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	
max	51290.00000	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	NaN	...	NaN	NaN	

11 rows × 24 columns

```
df.dtypes
```

```
                       0
      Row ID         int64
      Order ID       object
      Order Date     object
      Ship Date      object
      Ship Mode      object
      Customer ID    object
      Customer Name  object
      Segment        object
      City           object
      State          object
      Country        object
      Postal Code    float64
      Market         object
      Region         object
      Product ID     object
      Category       object
      Sub-Category   object
      Product Name   object
      Sales          float64
      Quantity       int64
      Discount       float64
      Profit         float64
      Shipping Cost  float64
      Order Priority object

dtype: object
```

```
#Columns that contain Float Values
float_type = df[['Postal Code', 'Sales', 'Discount', 'Profit', 'Shipping Cost']]
float_type.head()
```

```
   Postal Code     Sales  Discount     Profit  Shipping Cost
0      10024.0  2309.650       0.0   762.1845         933.57
1          NaN  3709.395       0.1  -288.7650         923.63
2          NaN  5175.171       0.1   919.9710         915.49
3          NaN  2892.510       0.1   -96.5400         910.16
4          NaN  2832.960       0.0   311.5200         903.04
```

Next steps: Generate code with float_type | View recommended plots | New interactive sheet

```
else_type = df[['Row ID', 'Order ID','Ship Mode','Customer ID','Customer Name',
               'Segment','City','State','Country']]
else_type.head()
```

```
   Row ID         Order ID      Ship Mode  Customer ID    Customer Name      Segment           City             State        Country
0   32298   CA-2012-124891       Same Day     RH-19495     Rick Hansen      Consumer  New York City          New York  United States
1   26341    IN-2013-77878   Second Class     JR-16210    Justin Ritter    Corporate     Wollongong   New South Wales      Australia
2   25330    IN-2013-71249    First Class     CR-12730    Craig Reiter      Consumer       Brisbane        Queensland      Australia
3   13524  ES-2013-1579342    First Class     KM-16375  Katherine Murray  Home Office         Berlin            Berlin        Germany
4   47221     SG-2013-4320       Same Day      RH-9495     Rick Hansen      Consumer          Dakar             Dakar        Senegal
```

Next steps: Generate code with else_type | View recommended plots | New interactive sheet

```
df.columns
```

```
Index(['Row ID', 'Order ID', 'Order Date', 'Ship Date', 'Ship Mode',
       'Customer ID', 'Customer Name', 'Segment', 'City', 'State', 'Country',
       'Postal Code', 'Market', 'Region', 'Product ID', 'Category',
       'Sub-Category', 'Product Name', 'Sales', 'Quantity', 'Discount',
       'Profit', 'Shipping Cost', 'Order Priority'],
      dtype='object')
```

```
date_type = df[['Order Date', 'Ship Date']]
date_type.head()
```

	Order Date	Ship Date
0	31-07-2012	31-07-2012
1	2/5/2013	5/2/2013
2	17-10-2013	17-10-2013
3	28-01-2013	28-01-2013
4	11/5/2013	5/11/2013

Next steps: Generate code with date_type | View recommended plots | New interactive sheet

```
df['Order Date'] = pd.to_datetime(df['Order Date'], format='mixed', errors='coerce')
df['Ship Date'] = pd.to_datetime(df['Ship Date'], format='mixed', errors='coerce')

# Verify the conversion
print(df[['Order Date', 'Ship Date']].dtypes)
```

```
Order Date    datetime64[ns]
Ship Date     datetime64[ns]
dtype: object
```

```
df.dtypes
```

	0
Row ID	int64
Order ID	object
Order Date	datetime64[ns]
Ship Date	datetime64[ns]
Ship Mode	object
Customer ID	object
Customer Name	object
Segment	object
City	object
State	object
Country	object
Postal Code	float64
Market	object
Region	object
Product ID	object
Category	object
Sub-Category	object
Product Name	object
Sales	float64
Quantity	int64
Discount	float64
Profit	float64
Shipping Cost	float64
Order Priority	object

dtype: object

```
df.columns
```

```
Index(['Row ID', 'Order ID', 'Order Date', 'Ship Date', 'Ship Mode',
       'Customer ID', 'Customer Name', 'Segment', 'City', 'State', 'Country',
       'Postal Code', 'Market', 'Region', 'Product ID', 'Category',
       'Sub-Category', 'Product Name', 'Sales', 'Quantity', 'Discount',
       'Profit', 'Shipping Cost', 'Order Priority'],
      dtype='object')
```

```
df['Ship Mode'] = data['Ship Mode'].astype('category')
df['Segment'] = data['Segment'].astype('category')
df['Country'] = data['Country'].astype('category')
df['Market'] = data['Market'].astype('category')
df['Region'] = data['Region'].astype('category')
df['Category'] = data['Category'].astype('category')
df['Sub-Category'] = data['Sub-Category'].astype('category')
df['Order Priority'] = data['Order Priority'].astype('category')
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51290 entries, 0 to 51289
Data columns (total 24 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Row ID          51290 non-null  int64
 1   Order ID        51290 non-null  object
 2   Order Date      51290 non-null  datetime64[ns]
 3   Ship Date       51290 non-null  datetime64[ns]
 4   Ship Mode       51290 non-null  category
 5   Customer ID     51290 non-null  object
 6   Customer Name   51290 non-null  object
 7   Segment         51290 non-null  category
 8   City            51290 non-null  object
 9   State           51290 non-null  object
 10  Country         51290 non-null  category
 11  Postal Code     9994 non-null   float64
 12  Market          51290 non-null  category
 13  Region          51290 non-null  category
 14  Product ID      51290 non-null  object
 15  Category        51290 non-null  category
 16  Sub-Category    51290 non-null  category
 17  Product Name    51290 non-null  object
 18  Sales           51290 non-null  float64
 19  Quantity        51290 non-null  int64
 20  Discount        51290 non-null  float64
 21  Profit          51290 non-null  float64
 22  Shipping Cost   51290 non-null  float64
 23  Order Priority  51290 non-null  category
dtypes: category(8), datetime64[ns](2), float64(5), int64(2), object(7)
memory usage: 6.7+ MB
```

```
df.duplicated().sum()
```

```
0
```

```
df.isnull().sum()
```

	0
Row ID	0
Order ID	0
Order Date	0
Ship Date	0
Ship Mode	0
Customer ID	0
Customer Name	0
Segment	0
City	0
State	0
Country	0
Postal Code	41296
Market	0
Region	0
Product ID	0
Category	0
Sub-Category	0
Product Name	0
Sales	0
Quantity	0
Discount	0
Profit	0
Shipping Cost	0
Order Priority	0

dtype: int64

```
df.nunique()
```

```
                     0
         Row ID  51290
       Order ID  25035
     Order Date   1430
      Ship Date   1430
      Ship Mode      4
    Customer ID   1590
  Customer Name    795
        Segment      3
           City   3636
          State   1094
        Country    147
    Postal Code    631
         Market      7
         Region     13
     Product ID  10292
       Category      3
   Sub-Category     17
   Product Name   3788
          Sales  22995
       Quantity     14
       Discount     27
         Profit  24575
  Shipping Cost  10037
 Order Priority      4

dtype: int64
```

```
postal_code_mode = df['Postal Code'].mode()[0]
#postal_code_mode
df['Postal Code'] = df['Postal Code'].fillna(postal_code_mode)
```

```
df['Postal Code'].isnull().sum()
```

```
0
```

```
df.columns
```

```
Index(['Row ID', 'Order ID', 'Order Date', 'Ship Date', 'Ship Mode',
       'Customer ID', 'Customer Name', 'Segment', 'City', 'State', 'Country',
       'Postal Code', 'Market', 'Region', 'Product ID', 'Category',
       'Sub-Category', 'Product Name', 'Sales', 'Quantity', 'Discount',
       'Profit', 'Shipping Cost', 'Order Priority'],
      dtype='object')
```

```
Sales_negative = df['Sales']>= 0
Sales_negative
```

	Sales
0	True
1	True
2	True
3	True
4	True
...	...
51285	True
51286	True
51287	True
51288	True
51289	True

51290 rows × 1 columns

dtype: bool

```
negative_sales = df[df['Sales'] < 0]
if not negative_sales.empty:
    print("Negative values in 'Sales':")
    print(negative_sales)
negative_sales
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	...	Product ID	Category	Sub-Category	Product Name	Sales	Quant

0 rows × 24 columns

```
# Check for negative values in 'Profit' column
negative_profit = df[df['Profit'] < 0]
if not negative_profit.empty:
    print("Negative values in 'Profit':")
    display(negative_profit.head(3))
```

```
Negative values in 'Profit':
```

	Row ID	Order ID	Order Date	Ship Date	Ship Mode	Customer ID	Customer Name	Segment	City	State	...	Product ID	Category	Sub-Category
1	26341	IN-2013-77878	2013-02-05	2013-05-02	Second Class	JR-16210	Justin Ritter	Corporate	Wollongong	New South Wales	...	FUR-CH-10003950	Furniture	Chairs
3	13524	ES-2013-1579342	2013-01-28	2013-01-28	First Class	KM-16375	Katherine Murray	Home Office	Berlin	Berlin	...	TEC-PH-10004583	Technology	Phones
9	40936	CA-2012-116638	2012-01-28	2012-01-28	Second Class	JH-15985	Joseph Holt	Consumer	Concord	North Carolina	...	FUR-TA-10000198	Furniture	Tables

3 rows × 24 columns

```
negative_profit_count = (df['Profit'] < 0).sum()
negative_profit_count
```

```
12544
```

```
mean_profit = df[df['Profit'] >= 0]['Profit'].mean()

data.loc[data['Profit'] < 0, 'Profit'] = mean_profit
mean_profit
```

```
61.634838357507874
```

```
# Replace negative 'Profit' values with the calculated mean
df['Profit'] = df['Profit'].apply(lambda x: mean_profit if x < 0 else x)
```

```
print("Negative values in 'Profit' have been replaced with the mean of non-negative profits.")
print(df['Profit'].head(5))
```

```
Negative values in 'Profit' have been replaced with the mean of non-negative profits.
0    762.184500
1     61.634838
2    919.971000
3     61.634838
4    311.520000
Name: Profit, dtype: float64
```

```
df.info()
```

```
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 51290 entries, 0 to 51289
Data columns (total 24 columns):
 #   Column          Non-Null Count  Dtype
---  ------          --------------  -----
 0   Row ID          51290 non-null  int64
 1   Order ID        51290 non-null  object
 2   Order Date      51290 non-null  datetime64[ns]
 3   Ship Date       51290 non-null  datetime64[ns]
 4   Ship Mode       51290 non-null  category
 5   Customer ID     51290 non-null  object
 6   Customer Name   51290 non-null  object
 7   Segment         51290 non-null  category
 8   City            51290 non-null  object
 9   State           51290 non-null  object
 10  Country         51290 non-null  category
 11  Postal Code     51290 non-null  float64
 12  Market          51290 non-null  category
 13  Region          51290 non-null  category
 14  Product ID      51290 non-null  object
 15  Category        51290 non-null  category
 16  Sub-Category    51290 non-null  category
 17  Product Name    51290 non-null  object
 18  Sales           51290 non-null  float64
 19  Quantity        51290 non-null  int64
 20  Discount        51290 non-null  float64
 21  Profit          51290 non-null  float64
 22  Shipping Cost   51290 non-null  float64
 23  Order Priority  51290 non-null  category
dtypes: category(8), datetime64[ns](2), float64(5), int64(2), object(7)
memory usage: 6.7+ MB
```

Segment the Data:

```
segment_data = df[['Customer ID','Customer Name','Category','Product Name','Sub-Category',
                  'Sales','Profit','Quantity','Discount','Order Date', 'City', 'State', 'Region',
                  'Market', 'Order Priority']]
segment_data.head()
```

	Customer ID	Customer Name	Category	Product Name	Sub-Category	Sales	Profit	Quantity	Discount	Order Date	City	State	R
0	RH-19495	Rick Hansen	Technology	Plantronics CS510 - Over-the-Head monaural Wir...	Accessories	2309.650	762.184500	7	0.0	2012-07-31	New York City	New York	
1	JR-16210	Justin Ritter	Furniture	Novimex Executive Leather Armchair, Black	Chairs	3709.395	61.634838	9	0.1	2013-02-05	Wollongong	New South Wales	O
2	CR-12730	Craig Reiter	Technology	Nokia Smart Phone, with Caller ID	Phones	5175.171	919.971000	9	0.1	2013-10-17	Brisbane	Queensland	O
3	KM-16375	Katherine Murray	Technology	Motorola Smart Phone, Cordless	Phones	2892.510	61.634838	5	0.1	2013-01-28	Berlin	Berlin	(
4	RH-9495	Rick Hansen	Technology	Sharp Wireless Fax, High-Speed	Copiers	2832.960	311.520000	8	0.0	2013-11-05	Dakar	Dakar	

Next steps: Generate code with `segment_data` View recommended plots New interactive sheet

Sales and Profit Analysis

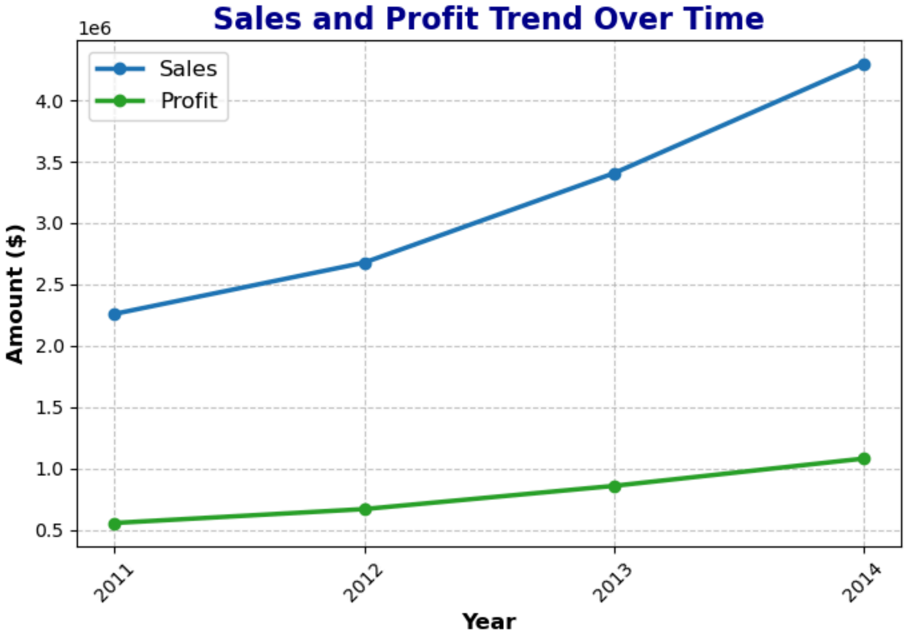
1. What is the trend of sales and profit over time?
2. Which regions and markets contribute the most to sales and profit?
3. Which cities and states are the most profitable?
4. Which products are the most popular (highest quantity sold)?
5. What is the sales and profit distribution across different markets?

What is the trend of sales and profit over time?

```
segment_data.loc[:, 'Order Date'] = pd.to_datetime(segment_data['Order Date'])
segment_data.loc[:, 'Year'] = segment_data['Order Date'].dt.year
sales_profit_trend = segment_data.groupby('Year')[['Sales', 'Profit']].sum()
print(sales_profit_trend)
```

```
             Sales        Profit
Year
2011  2.259451e+06  5.552016e+05
2012  2.677439e+06  6.684937e+05
2013  3.405746e+06  8.575934e+05
2014  4.299866e+06  1.079962e+06
C:\Users\Qammer Mehmood\AppData\Local\Temp\ipykernel_7208\2864655434.py:2: SettingWithCopyWarning:
A value is trying to be set on a copy of a slice from a DataFrame.
Try using .loc[row_indexer,col_indexer] = value instead

See the caveats in the documentation: https://pandas.pydata.org/pandas-docs/stable/user_guide/indexing.html#returning-a-view-v
  segment_data.loc[:, 'Year'] = segment_data['Order Date'].dt.year
```

```
plt.figure(figsize=(7, 5))
plt.plot(sales_profit_trend.index, sales_profit_trend['Sales'], label='Sales', color='#1f77b4', linewidth=2.5, marker='o')
plt.plot(sales_profit_trend.index, sales_profit_trend['Profit'], label='Profit', color='#2ca02c', linewidth=2.5, marker='o')
plt.title('Sales and Profit Trend Over Time', fontsize=16, fontweight='bold', color='darkblue')
plt.xlabel('Year', fontsize=12, fontweight='bold')
plt.ylabel('Amount ($)', fontsize=12, fontweight='bold')
plt.grid(True, linestyle='--', alpha=0.7)
plt.legend(loc='upper left', fontsize=12)
plt.xticks(sales_profit_trend.index, rotation=45)
plt.tight_layout()
plt.show()
```



Sales and Profit Trend Report

The line chart shows a consistent upward trend in both Sales (represented by the blue line) and Profit (represented by the green line) over the years. Sales growth indicates increasing revenue, while the profit trend highlights improved profitability. Year-to-year fluctuations reflect market and operational impacts, but the overall trajectory suggests strong business performance.

Which regions and markets contribute the most to sales and profit?

```
region_market_sales_profit = segment_data.groupby(['Region', 'Market'], observed=False)[['Sales', 'Profit']].sum()
top_region_sales = region_market_sales_profit.sort_values(by='Sales', ascending=False)
top_market_sales = region_market_sales_profit.sort_values(by='Profit', ascending=False)
```

```
print("Top Regions by Sales:")
top_region_sales[['Sales']].head()
```

```
Top Regions by Sales:
```

Region	Market	Sales
Central	EU	1.720553e+06
Oceania	APAC	1.100185e+06
Southeast Asia	APAC	8.844232e+05
North Asia	APAC	8.483098e+05
EMEA	EMEA	8.061613e+05

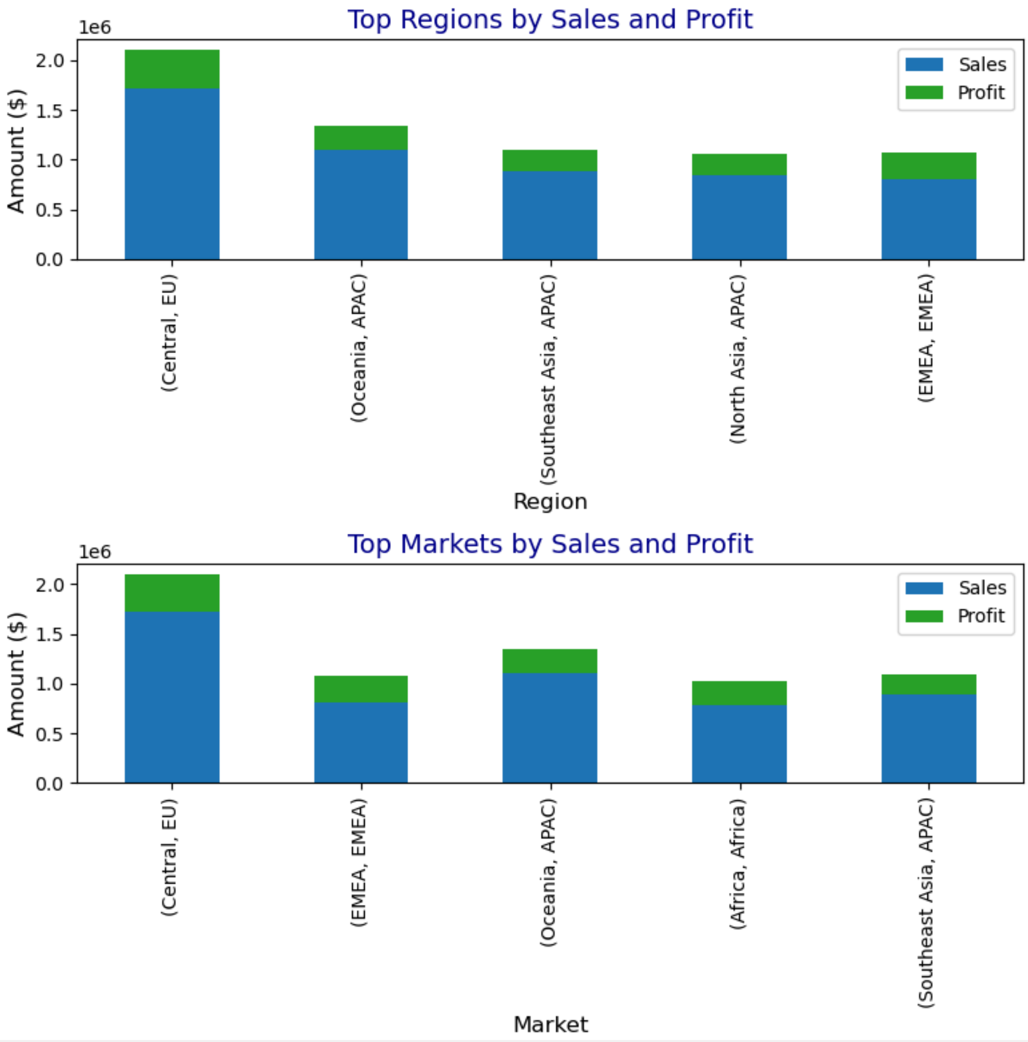
```
print("\nTop Markets by Profit:")
top_market_sales[['Profit']].head()
```

```

Top Markets by Profit:
```

Region	Market	Profit
Central	EU	380670.456092
EMEA	EMEA	265949.434402
Oceania	APAC	241333.589821
Africa	Africa	241230.547508
Southeast Asia	APAC	210130.967780

```
# Sort the data for regions and markets by Sales and Profit
top_regions_sales = region_market_sales_profit.sort_values(by='Sales', ascending=False).head()
top_markets_profit = region_market_sales_profit.sort_values(by='Profit', ascending=False).head()
```

```
# Create subplots
fig, ax = plt.subplots(2, 1, figsize=(8, 8))

# Plotting Sales by Region (Stacked Bar Chart)
top_regions_sales[['Sales', 'Profit']].plot(kind='bar', stacked=True, ax=ax[0], color=['#1f77b4', '#2ca02c'])
ax[0].set_title('Top Regions by Sales and Profit', fontsize=14, color='darkblue')
ax[0].set_ylabel('Amount ($)', fontsize=12)
ax[0].set_xlabel('Region', fontsize=12)

# Plotting Profit by Market (Stacked Bar Chart)
top_markets_profit[['Sales', 'Profit']].plot(kind='bar', stacked=True, ax=ax[1], color=['#1f77b4', '#2ca02c'])
ax[1].set_title('Top Markets by Sales and Profit', fontsize=14, color='darkblue')
ax[1].set_ylabel('Amount ($)', fontsize=12)
ax[1].set_xlabel('Market', fontsize=12)

# Show the plot
plt.tight_layout()
plt.show()
```



Most Profitable Regions and Markets

The analysis highlights the regions and markets with the highest contributions to both sales and profit. A stacked bar chart was used to compare sales and profit across different regions and markets. The blue bars represent sales, and the green bars represent profit, allowing easy visualization of the most profitable regions and markets. The chart clearly identifies the top-performing regions and markets, offering insights into key areas driving both sales and profit growth.

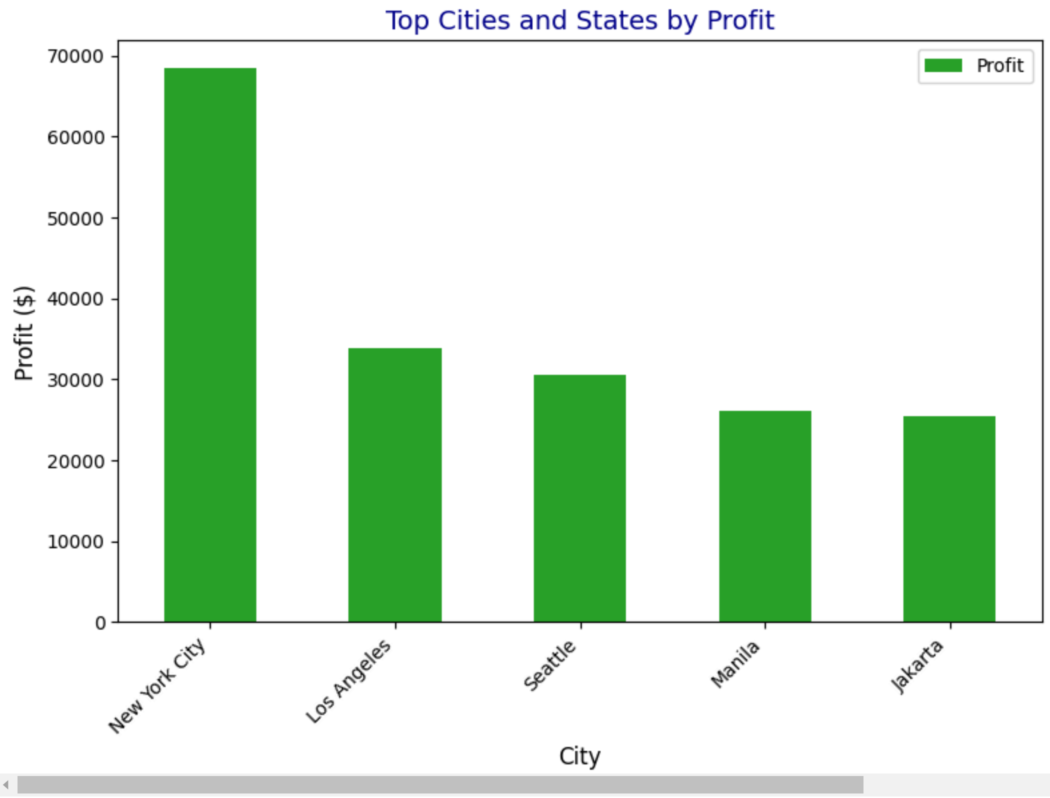
Which cities and states are the most profitable?

```
city_state_profit = segment_data.groupby(['City', 'State'])['Profit'].sum().reset_index()

top_city_state_profit = city_state_profit.sort_values(by='Profit', ascending=False).head()

top_city_state_profit
```

	City	State	Profit
2402	New York City	New York	68468.399834
2006	Los Angeles	California	33891.576919
3085	Seattle	Washington	30527.425014
2096	Manila	National Capital	26143.423492
1580	Jakarta	Jakarta	25412.669240

Next steps: Generate code with `top_city_state_profit` View recommended plots New interactive sheet

```
# Sort the data for top cities and states by Profit
top_city_state_profit = city_state_profit.sort_values(by='Profit', ascending=False).head()

# Create the bar chart
fig, ax = plt.subplots(figsize=(8, 6))

# Plotting Profit by City and State (Bar Chart)
top_city_state_profit.plot(kind='bar', x='City', y='Profit', ax=ax, color='#2ca02c')

# Set the title and labels
ax.set_title('Top Cities and States by Profit', fontsize=14, color='darkblue')
ax.set_ylabel('Profit ($)', fontsize=12)
ax.set_xlabel('City', fontsize=12)

# Rotate the x-axis labels for better readability
plt.xticks(rotation=45, ha='right')

# Show the plot
plt.tight_layout()
plt.show()
```



Report: Most Profitable Cities and States

The analysis identifies the top cities and states contributing the most to profit. The horizontal bar chart showcases the most profitable city-state pairs, with higher profit values clearly visible. Cities with the highest profits stand out, providing a quick comparison of profitability. The green bars represent total profit, offering insights into key areas of business performance.

```
# Grouping the data by Product Name and summing the Quantity
product_quantity = segment_data.groupby('Product Name')['Quantity'].sum().reset_index()

# Sorting the data by Quantity in descending order to get the most popular products
top_products = product_quantity.sort_values(by='Quantity', ascending=False).head()

# Display the result
top_products
```

```
                               Product Name  Quantity
3275                                Staples       876
894                  Cardinal Index Tab, Clear    337
1210             Eldon File Cart, Single Width    321
2840            Rogers File Cart, Single Width    262
3070   Sanford Pencil Sharpener, Water Color      259
```

Next steps: Generate code with top_products   View recommended plots   New interactive sheet

```
top_products = product_quantity.sort_values(by='Quantity', ascending=False).head()

fig, ax = plt.subplots(figsize=(6, 6))

ax.pie(top_products['Quantity'], labels=top_products['Product Name'], autopct='%1.1f%%', colors=['#1f77b4', '#2ca02c', '#ff7f0e', '#

ax.set_title('Top Products by Quantity Sold', fontsize=14, color='darkblue')

# Show the plot
plt.tight_layout()
plt.show()
```