analyze_data

January 18, 2024

[ ]:
```
!pip install pandas
!pip install matplotlib
!pip install seaborn
```

1 Import necessary libraries

[ ]:
```
import pandas as pd
import matplotlib.pyplot as plt
import seaborn as sns
```

2 Ensure plots are displayed inline

[ ]:
```
%matplotlib inline
```

3 Load datasets

[41]:
```
fulfillment_data = pd.read_csv('datasets/fulfillment.csv')
inventory_data = pd.read_csv('datasets/inventory.csv')
orders_and_shipments_data = pd.read_csv('datasets/orders_and_shipments.csv')

fulfillment_df = pd.read_csv('datasets/fulfillment.csv')
inventory_df = pd.read_csv('datasets/inventory.csv')
orders_shipments_df = pd.read_csv('datasets/orders_and_shipments.csv')

# Join datasets based on common columns
merged_data = pd.merge(orders_and_shipments_data, fulfillment_data, on='Product␣
 ↪Name', how='inner')
merged_data = pd.merge(merged_data, inventory_data, on='Product Name',␣
 ↪how='inner')

merged_df = pd.merge(orders_shipments_df, fulfillment_df, on='Product Name')
```

4 Explore the structure of each dataset

[42]:
```
print("Fulfillment Data:")
print(fulfillment_data.info())
print("\nInventory Data:")
print(inventory_data.info())
print("\nOrders and Shipments Data:")
print(orders_and_shipments_data.info())
```

```
Fulfillment Data:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 118 entries, 0 to 117
Data columns (total 2 columns):
 #   Column                                Non-Null Count  Dtype
---  ------                                --------------  -----
 0   Product Name                          118 non-null    object
 1    Warehouse Order Fulfillment (days)   118 non-null    float64
dtypes: float64(1), object(1)
memory usage: 2.0+ KB
None

Inventory Data:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 4200 entries, 0 to 4199
Data columns (total 4 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   Product Name            4200 non-null   object
 1    Year Month             4200 non-null   int64
 2    Warehouse Inventory    4200 non-null   int64
 3   Inventory Cost Per Unit 4200 non-null   float64
dtypes: float64(1), int64(2), object(1)
memory usage: 131.4+ KB
None

Orders and Shipments Data:
<class 'pandas.core.frame.DataFrame'>
RangeIndex: 30871 entries, 0 to 30870
Data columns (total 24 columns):
 #   Column                      Non-Null Count  Dtype
---  ------                      --------------  -----
 0   Order ID                    30871 non-null  int64
 1    Order Item ID              30871 non-null  int64
 2    Order YearMonth            30871 non-null  int64
 3    Order Year                 30871 non-null  int64
 4    Order Month                30871 non-null  int64
 5    Order Day                  30871 non-null  int64
 6   Order Time                  30871 non-null  object
```

```
 7   Order Quantity                30871 non-null  int64
 8   Product Department            30871 non-null  object
 9   Product Category              30871 non-null  object
 10  Product Name                  30871 non-null  object
 11   Customer ID                  30871 non-null  int64
 12  Customer Market               30871 non-null  object
 13  Customer Region               30871 non-null  object
 14  Customer Country              30871 non-null  object
 15  Warehouse Country             30871 non-null  object
 16  Shipment Year                 30871 non-null  int64
 17  Shipment Month                30871 non-null  int64
 18  Shipment Day                  30871 non-null  int64
 19  Shipment Mode                 30871 non-null  object
 20   Shipment Days - Scheduled    30871 non-null  int64
 21   Gross Sales                  30871 non-null  int64
 22   Discount %                   30871 non-null  object
 23   Profit                       30871 non-null  int64
dtypes: int64(14), object(10)
memory usage: 5.7+ MB
None
```

5 Basic statistical summary

[43]:
```
print("\nFulfillment Data Summary:")
print(fulfillment_data.describe())
print("\nInventory Data Summary:")
print(inventory_data.describe())
print("\nOrders and Shipments Data Summary:")
print(orders_and_shipments_data.describe())
```

```
Fulfillment Data Summary:
       Warehouse Order Fulfillment (days)
count                          118.000000
mean                             5.333898
std                              2.414282
min                              1.000000
25%                              3.300000
50%                              5.300000
75%                              6.975000
max                              9.900000

Inventory Data Summary:
         Year Month    Warehouse Inventory   Inventory Cost Per Unit
count    4200.000000           4200.000000              4200.000000
mean   201607.705714             16.908095                 1.236450
std        81.411495             71.121721                 0.652183
```

```
min    201501.000000              0.000000                0.102360
25%    201510.000000              0.000000                0.672187
50%    201607.000000              0.000000                1.262455
75%    201704.000000              4.000000                1.800760
max    201712.000000            931.000000                2.345030

Orders and Shipments Data Summary:
          Order ID    Order Item ID    Order YearMonth    Order Year   \
count  30871.000000     30871.000000       30871.000000  30871.000000
mean   35818.833792     89380.257361      201601.137411   2015.948657
std    20623.809444     51279.388574          79.438616      0.796323
min       11.000000        29.000000      201501.000000   2015.000000
25%    17905.000000     44721.500000      201509.000000   2015.000000
50%    35886.000000     89624.000000      201606.000000   2016.000000
75%    53507.000000    133710.500000      201702.000000   2017.000000
max    77095.000000    180410.000000      201712.000000   2017.000000

         Order Month     Order Day   Order Quantity   Customer ID   \
count   30871.000000  30871.000000    30871.000000   30871.000000
mean        6.271679     15.735026        2.149817    6477.672152
std         3.373914      8.484049        1.461393    3932.830830
min         1.000000      1.000000        1.000000       2.000000
25%         3.000000      9.000000        1.000000    3177.000000
50%         6.000000     16.000000        1.000000    6355.000000
75%         9.000000     23.000000        3.000000    9577.000000
max        12.000000     31.000000        5.000000   20648.000000

        Shipment Year  Shipment Month  Shipment Day  \
count   30871.000000    30871.000000  30871.000000
mean     2015.955427        6.299569     15.978005
std         0.798863        3.360191      8.582789
min      2015.000000        1.000000      1.000000
25%      2015.000000        3.000000      9.000000
50%      2016.000000        6.000000     16.000000
75%      2017.000000        9.000000     23.000000
max      2017.000000       12.000000     31.000000

         Shipment Days - Scheduled    Gross Sales        Profit
count                 30871.000000   30871.000000  30871.000000
mean                      3.072495     200.235690    129.383305
std                       1.184417     114.251482     52.649857
min                       1.000000      10.000000      6.000000
25%                       2.000000     120.000000     97.000000
50%                       4.000000     200.000000    125.000000
75%                       4.000000     300.000000    150.000000
max                       4.000000     533.000000    258.000000
```

6 What are the top-selling products in terms of gross sales?

[48]:
```
top_selling_products = orders_shipments_df.groupby('Product Name')[' Gross␣
↪Sales '].sum().nlargest(10)
print("Top-selling products:")
print(top_selling_products)
```

```
Top-selling products:
Product Name
Field & Stream Sportsman 16 Gun Fire Safe        1151200
Perfect Fitness Perfect Rip Deck                 777120
Diamondback Women's Serene Classic Comfort Bi    728100
Nike Men's Free 5.0+ Running Shoe                645500
Nike Men's Dri-FIT Victory Golf Polo             544300
Pelican Sunstream 100 Kayak                      536200
O'Brien Men's Neoprene Life Vest                 508200
Nike Men's CJ Elite 2 TD Football Cleat          501150
Under Armour Girls' Toddler Spine Surge Runni    227560
Web Camera                                        86332
Name:  Gross Sales , dtype: int64
```

7 Can you provide a breakdown of gross sales by product department?

[51]:
```
gross_sales_by_department = orders_shipments_df.groupby('Product Department')['␣
↪Gross Sales '].sum()
print("\nGross sales breakdown by product department:")
print(gross_sales_by_department)
```

```
Gross sales breakdown by product department:
Product Department
Apparel              1341243
Book Shop               1736
Discs Shop             26955
Fan Shop             2934670
Fitness                59268
Footwear              697686
Golf                  805305
Health and Beauty       8497
Outdoors              200834
Pet Shop                6300
Technology             98982
Name:  Gross Sales , dtype: int64
```

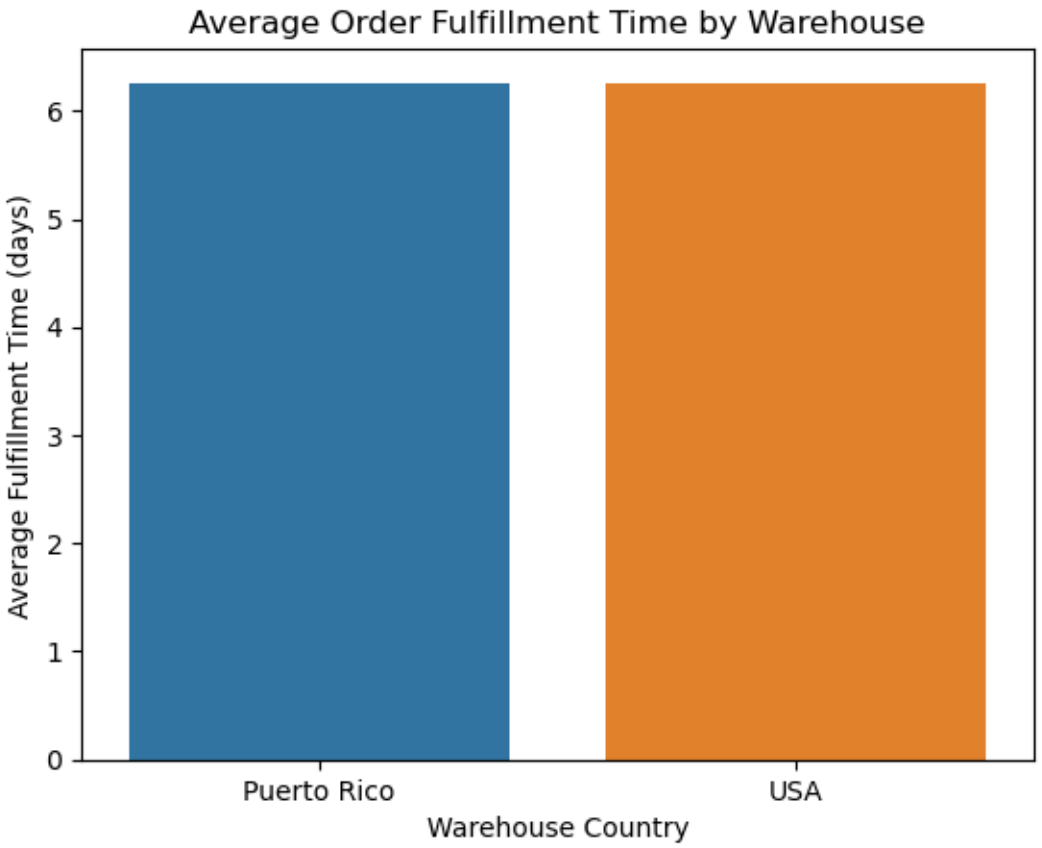
8 How does the order fulfillment time vary across different warehouses?

[61]:
```
fulfillment_time_by_warehouse = merged_df.groupby('Warehouse Country')['␣
↪Warehouse Order Fulfillment (days) '].mean()
print("\nAverage order fulfillment time by warehouse:")
print(fulfillment_time_by_warehouse)
```

```
Average order fulfillment time by warehouse:
Warehouse Country
Puerto Rico    6.245932
USA            6.258930
Name:  Warehouse Order Fulfillment (days) , dtype: float64
```

9 Plotting the average order fulfillment time by warehouse

[62]:
```
sns.barplot(x=fulfillment_time_by_warehouse.index,␣
↪y=fulfillment_time_by_warehouse.values)
plt.title('Average Order Fulfillment Time by Warehouse')
plt.xlabel('Warehouse Country')
plt.ylabel('Average Fulfillment Time (days)')
plt.show()
```



10 What is the average discount percentage for orders in each product category?

[65]:
```
# Convert 'Discount %' column to numeric
orders_shipments_df[' Discount % '] = pd.to_numeric(orders_shipments_df['␣
 ↪Discount % '], errors='coerce')

avg_discount_by_category = orders_shipments_df.groupby('Product Category')['␣
 ↪Discount % '].mean()
print("\nAverage discount percentage by product category:")
print(avg_discount_by_category)
```

```
Average discount percentage by product category:
Product Category
Accessories              0.117902
As Seen on  TV!          0.118182
Baby                     0.106000
Baseball & Softball      0.115182
```

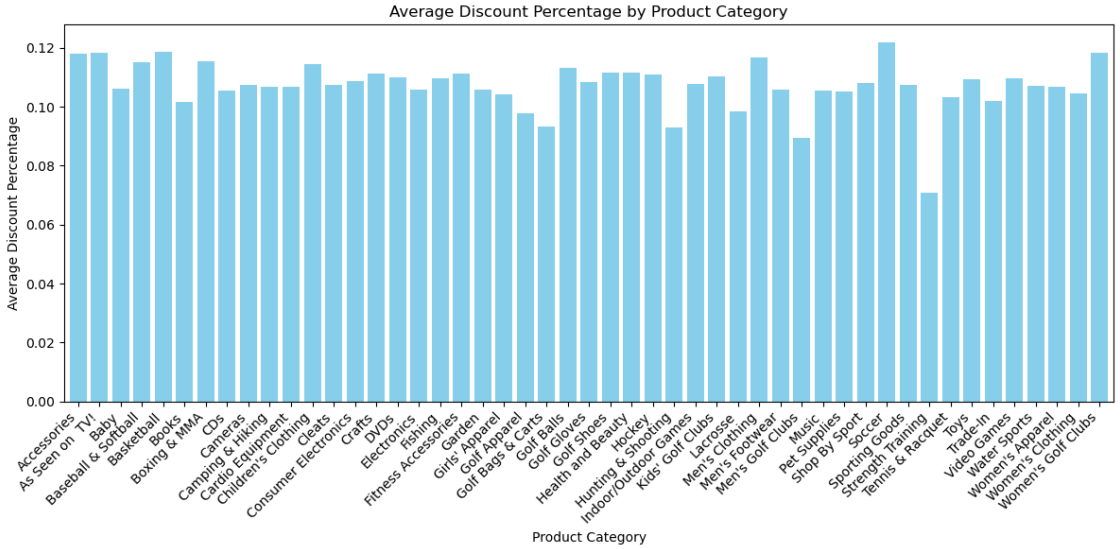
```
Basketball              0.118571
Books                   0.101538
Boxing & MMA            0.115278
CDs                     0.105500
Cameras                 0.107253
Camping & Hiking        0.106902
Cardio Equipment        0.106863
Children's Clothing     0.114444
Cleats                  0.107365
Consumer Electronics    0.108696
Crafts                  0.111111
DVDs                    0.109820
Electronics             0.105923
Fishing                 0.109693
Fitness Accessories     0.111400
Garden                  0.105873
Girls' Apparel          0.104158
Golf Apparel            0.097778
Golf Bags & Carts       0.093333
Golf Balls              0.113099
Golf Gloves             0.108503
Golf Shoes              0.111609
Health and Beauty       0.111429
Hockey                  0.110854
Hunting & Shooting      0.092813
Indoor/Outdoor Games    0.107825
Kids' Golf Clubs        0.110317
Lacrosse                0.098545
Men's Clothing          0.116667
Men's Footwear          0.105716
Men's Golf Clubs        0.089286
Music                   0.105385
Pet Supplies            0.105000
Shop By Sport           0.108188
Soccer                  0.121739
Sporting Goods          0.107381
Strength Training       0.070769
Tennis & Racquet        0.103276
Toys                    0.109437
Trade-In                0.101882
Video Games             0.109677
Water Sports            0.107162
Women's Apparel         0.106676
Women's Clothing        0.104394
Women's Golf Clubs      0.118400
Name:  Discount % , dtype: float64
```

11 Plotting the average discount percentage by product category

[73]:
```
# Increase the figure size to make more room for x-axis labels
plt.figure(figsize=(12, 6))

avg_discount_by_category.plot(kind='bar', color='skyblue', width=0.8)

plt.title('Average Discount Percentage by Product Category')
plt.xlabel('Product Category')
plt.ylabel('Average Discount Percentage')
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show()
```



12 Which warehouse has the highest and lowest inventory levels?

[68]:
```
highest_inventory_warehouse = inventory_df.loc[inventory_df[' Warehouse␣
  ↪Inventory '].idxmax()]['Product Name']
lowest_inventory_warehouse = inventory_df.loc[inventory_df[' Warehouse␣
  ↪Inventory '].idxmin()]['Product Name']
print(f"\nWarehouse with the highest inventory: {highest_inventory_warehouse}")
print(f"Warehouse with the lowest inventory: {lowest_inventory_warehouse}")
```

```
Warehouse with the highest inventory: Perfect Fitness Perfect Rip Deck
Warehouse with the lowest inventory: Perfect Fitness Perfect Rip Deck
```

13 What is the average profit margin for each product category?

[70]:
```
avg_profit_margin_by_category = orders_shipments_df.groupby('Product␣
  ↪Category')[' Profit '].mean()
print("\nAverage profit margin by product category:")
print(avg_profit_margin_by_category)
```

```
Average profit margin by product category:
Product Category
Accessories              56.633229
As Seen on  TV!         135.000000
Baby                     28.000000
Baseball & Softball     102.741071
Basketball              132.000000
Books                    15.000000
Boxing & MMA            129.565789
CDs                       6.000000
Cameras                 219.000000
Camping & Hiking        150.000000
Cardio Equipment        239.447489
Children's Clothing     169.000000
Cleats                  146.984644
Consumer Electronics    123.000000
Crafts                  231.000000
DVDs                     79.000000
Electronics              84.267308
Fishing                 200.000000
Fitness Accessories      66.000000
Garden                  258.000000
Girls' Apparel           88.560000
Golf Apparel             47.275862
Golf Bags & Carts        82.000000
Golf Balls               40.208889
Golf Gloves              70.765363
Golf Shoes              126.354839
Health and Beauty       136.000000
Hockey                   47.393258
Hunting & Shooting       74.647059
Indoor/Outdoor Games    125.000000
Kids' Golf Clubs         88.507463
Lacrosse                 77.472727
Men's Clothing           87.000000
Men's Footwear           65.000000
Men's Golf Clubs        100.295082
Music                   110.000000
Pet Supplies             40.000000
Shop By Sport            95.919958
```

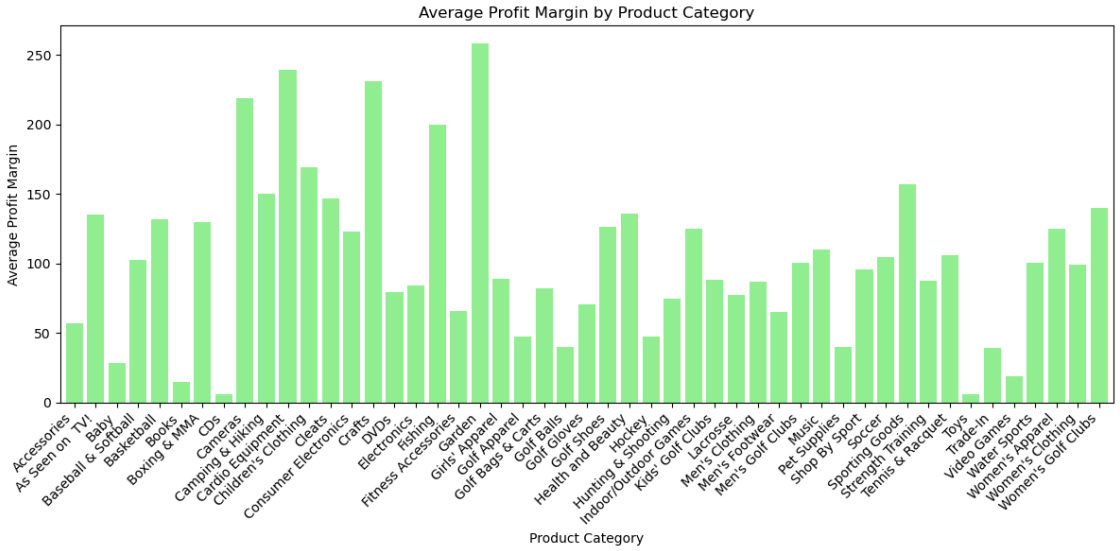
```
Soccer                  104.208333
Sporting Goods          157.000000
Strength Training        87.428571
Tennis & Racquet        106.000000
Toys                      6.000000
Trade-In                 39.166667
Video Games              19.000000
Water Sports            100.187500
Women's Apparel         125.000000
Women's Clothing         99.000000
Women's Golf Clubs      139.814815
Name:  Profit , dtype: float64
```

14 Plotting the average profit margin by product category

[74]:
```
# Increase the figure size to make more room for x-axis labels
plt.figure(figsize=(12, 6))

avg_profit_margin_by_category.plot(kind='bar', color='lightgreen', width=0.8)

plt.title('Average Profit Margin by Product Category')
plt.xlabel('Product Category')
plt.ylabel('Average Profit Margin')
plt.xticks(rotation=45, ha='right')
plt.tight_layout()
plt.show()
```



15 Can you identify any seasonal trends in order quantities or gross sales?

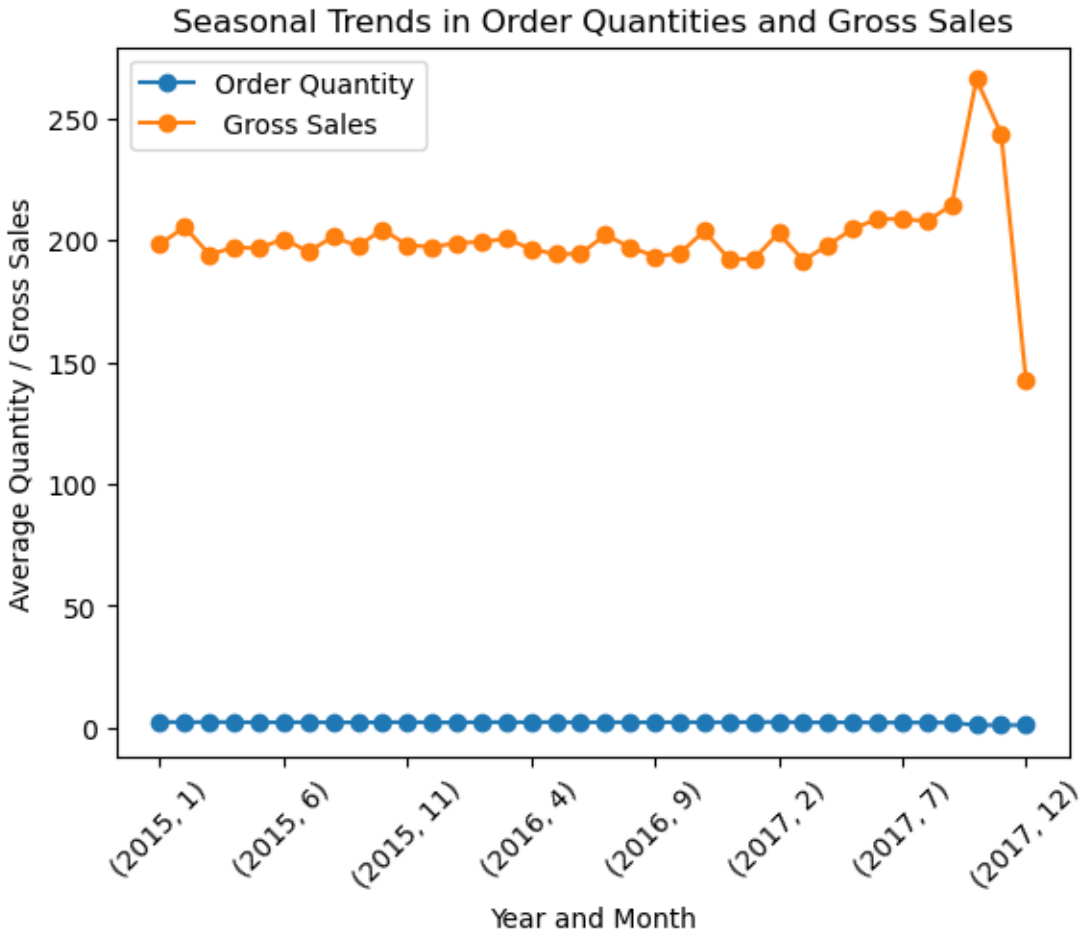
[78]:
```
seasonal_trends = orders_shipments_df.groupby([' Order Year ', ' Order Month
↪'])[['Order Quantity', ' Gross Sales ']].mean()
print("\nSeasonal Trends in Order Quantities and Gross Sales:")
print(seasonal_trends)
```

```
Seasonal Trends in Order Quantities and Gross Sales:
                            Order Quantity   Gross Sales
 Order Year   Order Month
2015          1                   2.284114    198.362525
              2                   2.230058    205.589595
              3                   2.310011    194.173305
              4                   2.244161    197.194268
              5                   2.156863    196.757353
              6                   2.177956    200.629162
              7                   2.248581    195.373439
              8                   2.092255    201.534169
              9                   2.147406    197.698113
              10                  2.153499    204.518059
              11                  2.304450    198.033958
              12                  2.115075    197.310702
2016          1                   2.125257    198.998973
              2                   2.259756    199.384146
              3                   2.225287    200.697701
              4                   2.220866    196.529412
              5                   2.277720    194.326425
              6                   2.165127    194.515012
              7                   2.203252    202.299797
              8                   2.187621    197.242747
              9                   2.156600    193.502237
              10                  2.262902    194.588121
              11                  2.161123    203.854470
              12                  2.191930    192.390403
2017          1                   2.261593    192.306778
              2                   2.353846    203.027473
              3                   2.156250    191.840402
              4                   2.143021    198.044622
              5                   2.147486    204.768715
              6                   2.043528    208.830470
              7                   2.090408    208.754135
              8                   2.090700    207.989667
              9                   2.039572    214.457754
              10                  1.022039    266.129477
              11                  1.000000    243.718391
```

```
12                    1.000000       142.628483
```

16 Plot Seasonal Trends in Order Quantities and Gross Sales

[117]:
```
seasonal_trends.plot(kind='line', marker='o')
plt.title('Seasonal Trends in Order Quantities and Gross Sales')
plt.xlabel('Year and Month')
plt.ylabel('Average Quantity / Gross Sales')
plt.xticks(rotation=45)
plt.show()
```



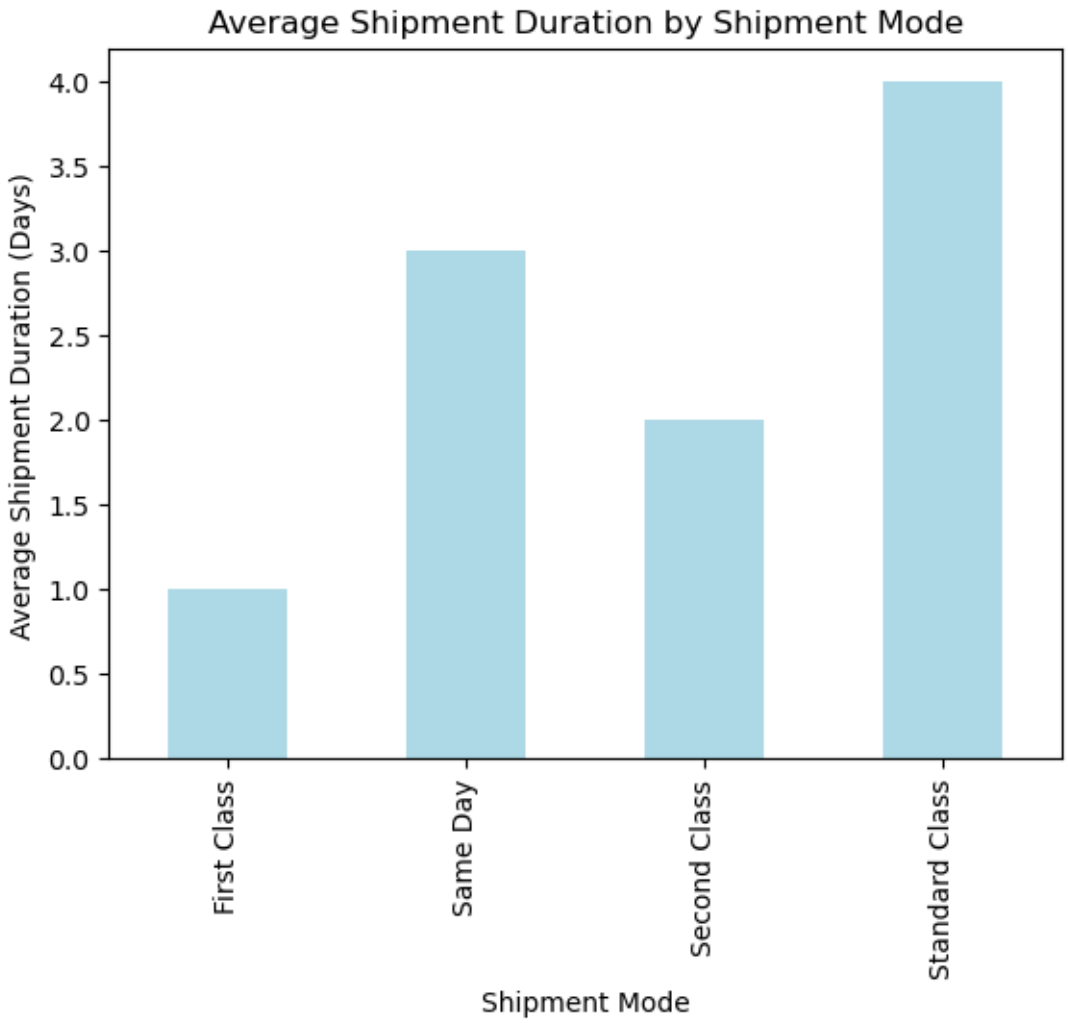
17 What is the average shipment duration for each shipment mode?

[81]:
```
avg_shipment_duration_by_mode = orders_shipments_df.groupby('Shipment Mode')['␣
↪Shipment Days - Scheduled '].mean()
print("\nAverage Shipment Duration by Shipment Mode:")
print(avg_shipment_duration_by_mode)
```

```
Average Shipment Duration by Shipment Mode:
Shipment Mode
First Class       1.0
Same Day          3.0
Second Class      2.0
Standard Class    4.0
Name:  Shipment Days - Scheduled , dtype: float64
```

18 Plot Average Shipment Duration by Shipment Mode

[82]:
```
avg_shipment_duration_by_mode.plot(kind='bar', color='lightblue')
plt.title('Average Shipment Duration by Shipment Mode')
plt.xlabel('Shipment Mode')
plt.ylabel('Average Shipment Duration (Days)')
plt.show()
```



19 Are there any products with consistently high or low discount percentages?

[83]:
```
discount_percentages = orders_shipments_df.groupby('Product Name')[' Discount %␣
↪'].mean()
high_discount_products = discount_percentages[discount_percentages > 0.2].index
low_discount_products = discount_percentages[discount_percentages < 0.05].index
print("\nProducts with Consistently High Discount Percentages:")
print(high_discount_products)
print("\nProducts with Consistently Low Discount Percentages:")
print(low_discount_products)
```

```
Products with Consistently High Discount Percentages:
```

```
Index(['Garmin Approach S4 Golf GPS Watch'], dtype='object', name='Product
Name')

Products with Consistently Low Discount Percentages:
Index(['GoPro HERO3+ Black Edition Camera'], dtype='object', name='Product
Name')
```

20 What are the most and least profitable product categories?

[91]:
```
profitable_categories = avg_profit_margin_by_category.idxmax(),␣
↪avg_profit_margin_by_category.idxmin()
print("\nMost Profitable Product Category:", profitable_categories[0])
print("Least Profitable Product Category:", profitable_categories[1])
```

```
Most Profitable Product Category: Garden
Least Profitable Product Category: CDs
```

21 Can you provide a geographical breakdown of customer markets and their corresponding gross sales?

[93]:
```
geographical_breakdown = orders_shipments_df.groupby(['Customer Market',␣
↪'Customer Region', 'Customer Country'])[' Gross Sales '].sum()
print("\nGeographical Breakdown of Customer Markets and Gross Sales:")
print(geographical_breakdown)
```

```
Geographical Breakdown of Customer Markets and Gross Sales:
Customer Market  Customer Region  Customer Country
Africa           Central Africa   Angola                          8671
                                  Cameroon                       10820
                                  Democratic Republic of Congo   27856
                                  Gabon                           4275
                                  Republic of Congo               1645
                                                                  …
Pacific Asia     West Asia        Saudi Arabia                   35701
                                  Syria                           3770
                                  Turkey                        114352
                                  UAE                             2216
                                  Yemen                           2650
Name:  Gross Sales , Length: 142, dtype: int64
```

22 What is the overall trend in gross sales over the years?

[98]:
```
overall_gross_sales_trend = orders_shipments_df.groupby(' Order Year ')[' Gross␣
 ↪Sales '].sum()
print("\nOverall Trend in Gross Sales Over the Years:")
print(overall_gross_sales_trend)
```

```
Overall Trend in Gross Sales Over the Years:
 Order Year
2015    2112579
2016    2213350
2017    1855547
Name:  Gross Sales , dtype: int64
```

23 Are there any products that have experienced a significant increase or decrease in sales over time?

[115]:
```
product_sales_over_time = orders_shipments_df.groupby(['Product Name', ' Order␣
 ↪Year '])['Order Quantity'].sum().unstack()
product_sales_change = (product_sales_over_time.iloc[:, -1] -␣
 ↪product_sales_over_time.iloc[:, 0]) / product_sales_over_time.iloc[:, 0]
significant_sales_change = product_sales_change[product_sales_change.abs() > 0.
 ↪5].index
print("\nProducts with Significant Increase or Decrease in Sales Over Time:")
print(significant_sales_change)
```

```
Products with Significant Increase or Decrease in Sales Over Time:
Index(['Baby sweater', 'Bag Boy Beverage Holder', 'Bag Boy M330 Push Cart',
       'Bridgestone e6 Straight Distance NFL Carolina',
       'Bridgestone e6 Straight Distance NFL San Dieg',
       'Bridgestone e6 Straight Distance NFL Tennesse', 'CDs of rock',
       'Cleveland Golf Women's 588 RTX CB Satin Chrom',
       'Clicgear 8.0 Shoe Brush', 'DVDs', 'ENO Atlas Hammock Straps',
       'Elevation Training Mask 2.0', 'Fighting video games',
       'Glove It Imperial Golf Towel', 'Glove It Urban Brick Golf Towel',
       'Glove It Women's Imperial Golf Glove',
       'Glove It Women's Mod Oval 3-Zip Carry All Gol',
       'Hirzl Men's Hybrid Golf Glove', 'Hirzl Women's Hybrid Golf Glove',
       'Hirzl Women's Soffft Flex Golf Glove',
       'Industrial consumer electronics', 'LIJA Women's Argyle Golf Polo',
       'LIJA Women's Button Golf Dress',
       'LIJA Women's Eyelet Sleeveless Golf Polo', 'Lawn mower',
       'MDGolf Pittsburgh Penguins Putter',
       'Merrell Men's All Out Flash Trail Running Sho',
       'Merrell Women's Grassbow Sport Hiking Shoe',
```

```
 'Mio ALPHA Heart Rate Monitor/Sport Watch',
 'Nike Dri-FIT Crew Sock 6 Pack', 'Nike Men's Comfort 2 Slide',
 'Nike Women's Free 5.0 TR FIT PRT 4 Training S',
 'Nike Women's Legend V-Neck T-Shirt', 'Nike Women's Tempo Shorts',
 'Polar Loop Activity Tracker', 'Porcelain crafts', 'Rock music',
 'Smart watch', 'Sports Books', 'Summer dresses',
 'TYR Boys' Team Digi Jammer',
 'Team Golf New England Patriots Putter Grip',
 'Team Golf Pittsburgh Steelers Putter Grip',
 'Team Golf San Francisco Giants Putter Grip',
 'Team Golf St. Louis Cardinals Putter Grip',
 'Team Golf Tennessee Volunteers Putter Grip',
 'Team Golf Texas Longhorns Putter Grip',
 'The North Face Women's Recon Backpack',
 'Titleist Pro V1 High Numbers Personalized Gol',
 'Titleist Pro V1x Golf Balls',
 'Titleist Pro V1x High Numbers Golf Balls',
 'Titleist Pro V1x High Numbers Personalized Go',
 'Titleist Small Wheeled Travel Cover',
 'Top Flite Women's 2017 XL Hybrid',
 'Under Armour Kids' Mercenary Slide',
 'Under Armour Men's Compression EV SL Slide',
 'Under Armour Women's Ignite PIP VI Slide',
 'Under Armour Women's Ignite Slide', 'Web Camera',
 'Yakima DoubleDown Ace Hitch Mount 4-Bike Rack',
 'adidas Kids' F5 Messi FG Soccer Cleat',
 'adidas Men's F10 Messi TRX FG Soccer Cleat'],
dtype='object', name='Product Name')
```

24 What is the average order quantity for different product categories?

[107]:
```
avg_order_quantity_by_category = orders_shipments_df.groupby('Product␣
↪Category')['Order Quantity'].mean()
print("\nAverage Order Quantity for Different Product Categories:")
print(avg_order_quantity_by_category)
```

```
Average Order Quantity for Different Product Categories:
Product Category
Accessories             2.993730
As Seen on  TV!         2.727273
Baby                    1.000000
Baseball & Softball     2.705357
Basketball              1.000000
Books                   1.000000
Boxing & MMA            3.105263
```

```
CDs                     1.000000
Cameras                 1.000000
Camping & Hiking        1.000000
Cardio Equipment        3.020091
Children's Clothing     1.000000
Cleats                  3.014891
Consumer Electronics    1.000000
Crafts                  1.000000
DVDs                    1.000000
Electronics             2.921154
Fishing                 1.000000
Fitness Accessories     2.509434
Garden                  1.000000
Girls' Apparel          3.090000
Golf Apparel            2.637931
Golf Bags & Carts       1.000000
Golf Balls              2.977778
Golf Gloves             2.765363
Golf Shoes              2.838710
Health and Beauty       1.000000
Hockey                  2.775281
Hunting & Shooting      2.558824
Indoor/Outdoor Games    2.975410
Kids' Golf Clubs        1.656716
Lacrosse                3.000000
Men's Clothing          1.000000
Men's Footwear          1.000000
Men's Golf Clubs        1.491803
Music                   1.000000
Pet Supplies            1.000000
Shop By Sport           3.040021
Soccer                  2.125000
Sporting Goods          1.000000
Strength Training       1.000000
Tennis & Racquet        2.721311
Toys                    1.000000
Trade-In                2.827778
Video Games             1.000000
Water Sports            1.000000
Women's Apparel         3.005522
Women's Clothing        1.000000
Women's Golf Clubs      2.333333
Name: Order Quantity, dtype: float64
```

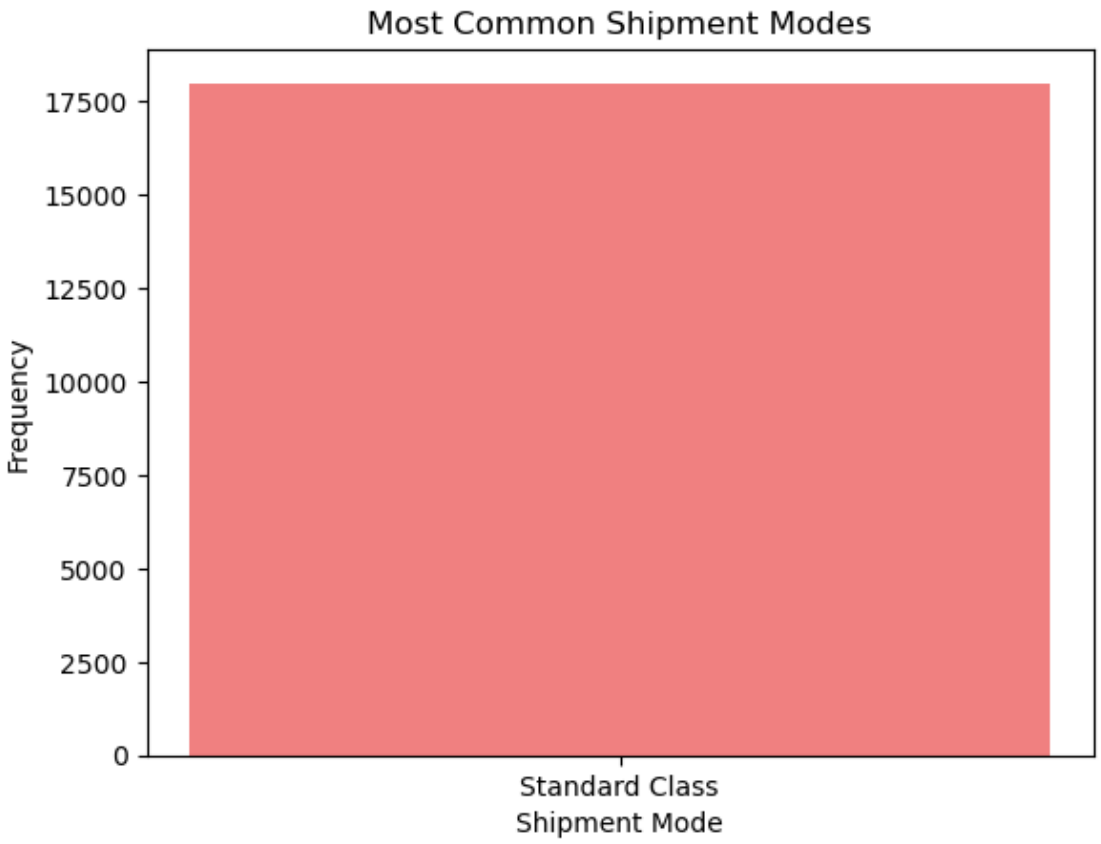
25 What are the most common shipment modes used?

[112]:
```
most_common_shipment_modes = orders_shipments_df['Shipment Mode'].
  ↪value_counts().idxmax()
print("\nMost Common Shipment Modes:")
print(most_common_shipment_modes)
```

```
Most Common Shipment Modes:
Standard Class
```

26 Plot Most Common Shipment Modes

[114]:
```
plt.bar(x=most_common_shipment_modes, height=orders_shipments_df['Shipment␣
  ↪Mode'].value_counts()[most_common_shipment_modes], color='lightcoral')
plt.title('Most Common Shipment Modes')
plt.xlabel('Shipment Mode')
plt.ylabel('Frequency')
plt.show()
```



[ ]: