Once the data was cleaned, I used Python to start answering various analysis questions. The goal was to uncover valuable insights for the organization, such as identifying sales trends, performance by region, and product category success. By utilizing Python libraries like Pandas and Matplotlib, I was able to visualize the data and provide meaningful insights for decision-makers.

1-What are the total sales per region?
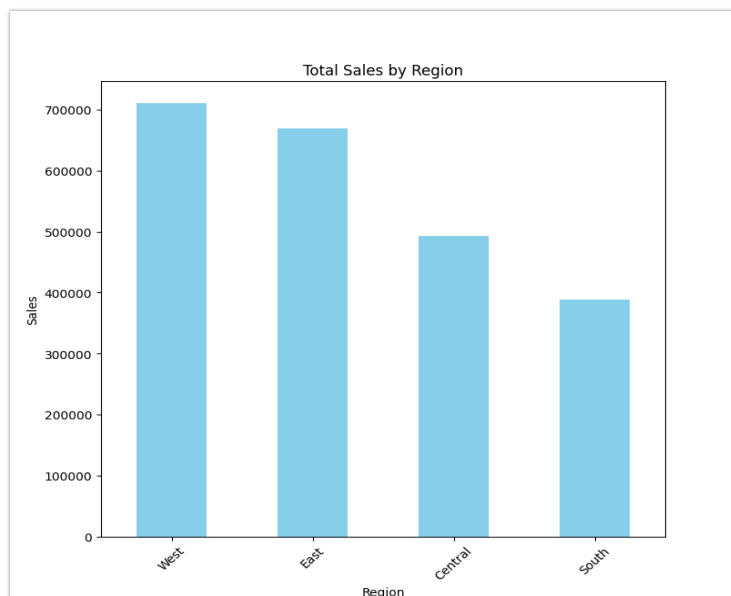

```python
# إجمالي المبيعات لكل منطقة
region_sales = df.groupby('Region')['Sales'].sum().sort_values(ascending=False)
print(region_sales)

# رسم بياني لأداء المبيعات لكل منطقة
plt.figure(figsize=(8, 6))
region_sales.plot(kind='bar', color='skyblue')
plt.title('Total Sales by Region')
plt.ylabel('Sales')
plt.xlabel('Region')
plt.xticks(rotation=45)
plt.show()
```

Purpose: To analyze the distribution of sales across different regions.

Benefit: This chart helped identify the most profitable regions and those that may require improvements in sales or marketing strategies.

## 2- What are the total sales for each category in each region?
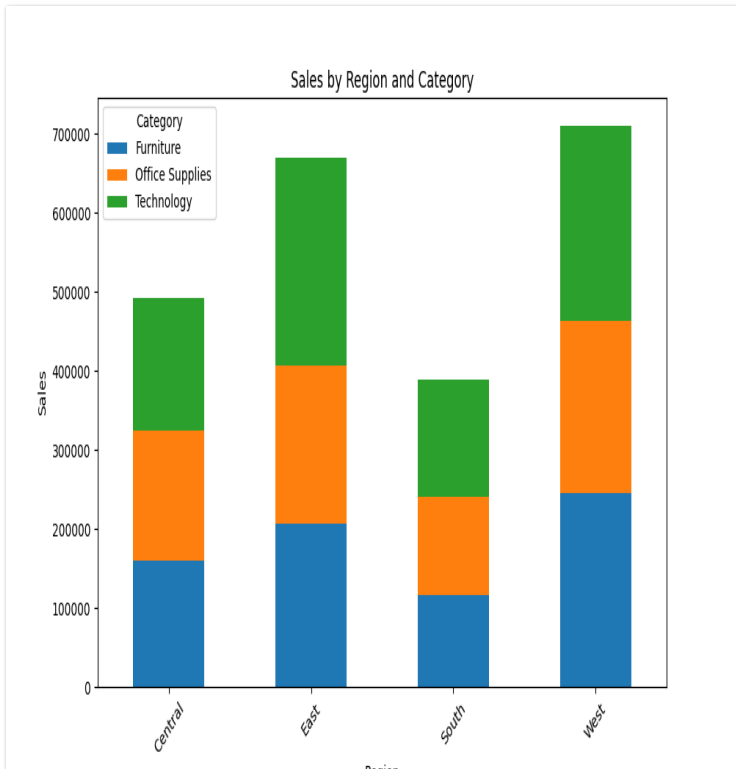

```
# إجمالي المبيعات لكل فئة في كل منطقة
region_category_sales = df.groupby(['Region', 'Category'])['Sales'].sum().unstack()
print(region_category_sales)


# رسم بياني للمبيعات حسب المنطقة والفئة
region_category_sales.plot(kind='bar', stacked=True, figsize=(10, 6))
plt.title('Sales by Region and Category')
plt.ylabel('Sales')
plt.xlabel('Region')
plt.xticks(rotation=45)
plt.legend(title='Category')
plt.show()
```

- **Purpose**: To analyze the performance of different product categories across various regions.
- **Benefit**: It provided insights into which categories perform best in each region, helping to tailor marketing efforts and inventory management accordingly.

3-What are your total monthly sales?
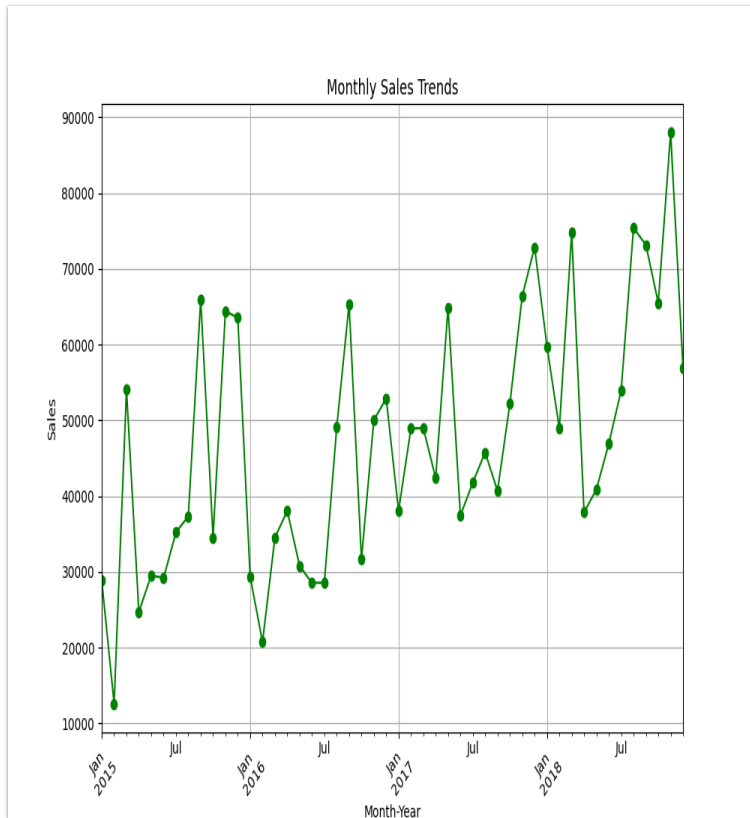

```python
# تحويل تاريخ الطلب إلى تاريخ فعلي
df['Order Date'] = pd.to_datetime(df['Order Date'])

# إضافة عمود الشهر والسنة
df['Year-Month'] = df['Order Date'].dt.to_period('M')

# إجمالي المبيعات الشهرية
monthly_sales = df.groupby('Year-Month')['Sales'].sum()
print(monthly_sales)

# رسم بياني لاتجاهات المبيعات الشهرية
plt.figure(figsize=(10, 6))
monthly_sales.plot(kind='line', marker='o', color='green')
plt.title('Monthly Sales Trends')
plt.ylabel('Sales')
plt.xlabel('Month-Year')
plt.xticks(rotation=45)
plt.grid(True)
plt.show()
```
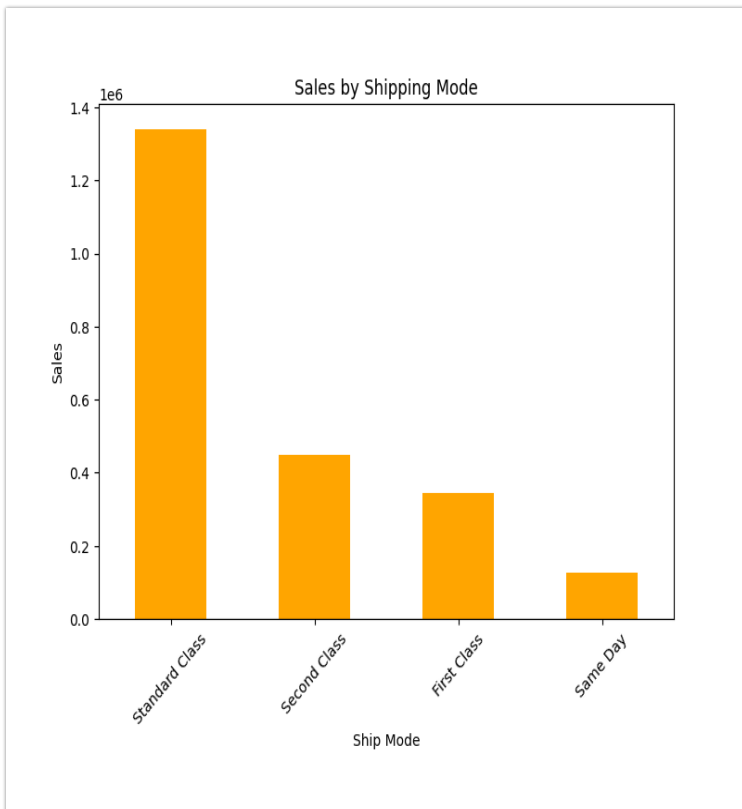
Purpose: To track sales performance over time on a monthly basis.

 Benefit: This chart revealed seasonal trends or periods of increased sales, enabling better planning for future demand and inventory management.

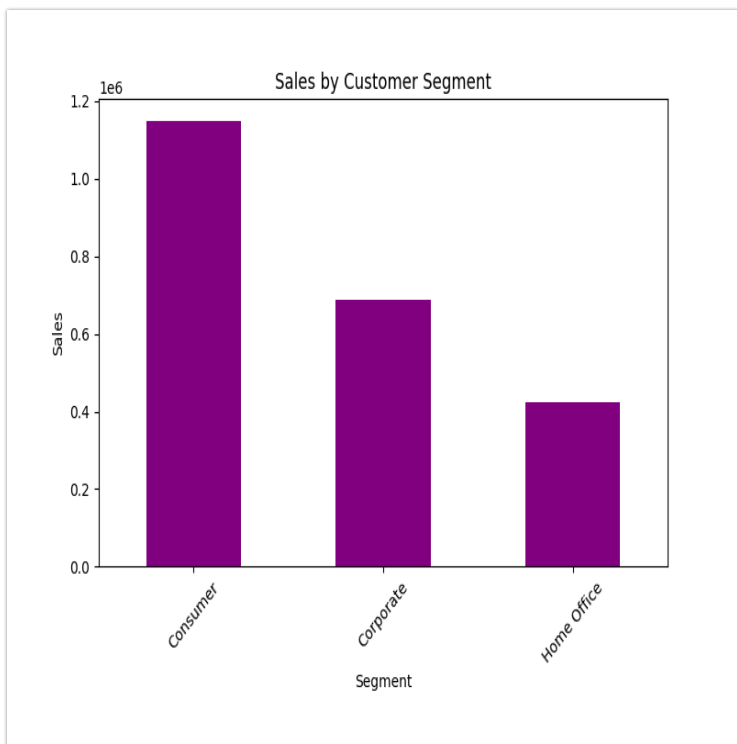# 4- What are the total sales for each shipping method?


```python
# إجمالي المبيعات لكل طريقة شحن
ship_sales = df.groupby('Ship Mode')['Sales'].sum().sort_values(ascending=False)
print(ship_sales)

# رسم بياني لأداء المبيعات حسب طريقة الشحن
plt.figure(figsize=(8, 6))
ship_sales.plot(kind='bar', color='orange')
plt.title('Sales by Shipping Mode')
plt.ylabel('Sales')
plt.xlabel('Ship Mode')
plt.xticks(rotation=45)
plt.show()
```

Purpose: To assess the impact of different shipping methods on sales.

Benefit: It showed which shipping methods were preferred by customers and how they contributed to overall sales, allowing for optimization of shipping strategies.

## 5- What are the total sales for each customer segment?


```python
# إجمالي المبيعات لكل شريحة عملاء
segment_sales = df.groupby('Segment')['Sales'].sum().sort_values(ascending=False)
print(segment_sales)

# رسم بياني لأداء المبيعات حسب شريحة العملاء
plt.figure(figsize=(8, 6))
segment_sales.plot(kind='bar', color='purple')
plt.title('Sales by Customer Segment')
plt.ylabel('Sales')
plt.xlabel('Segment')
plt.xticks(rotation=45)
plt.show()
```

Purpose: To analyze the sales contribution of different customer segments.

Benefit: This chart highlighted the most valuable customer segments, enabling targeted marketing and customer engagement strategies.

# 6- What are the total sales for each subcategory?
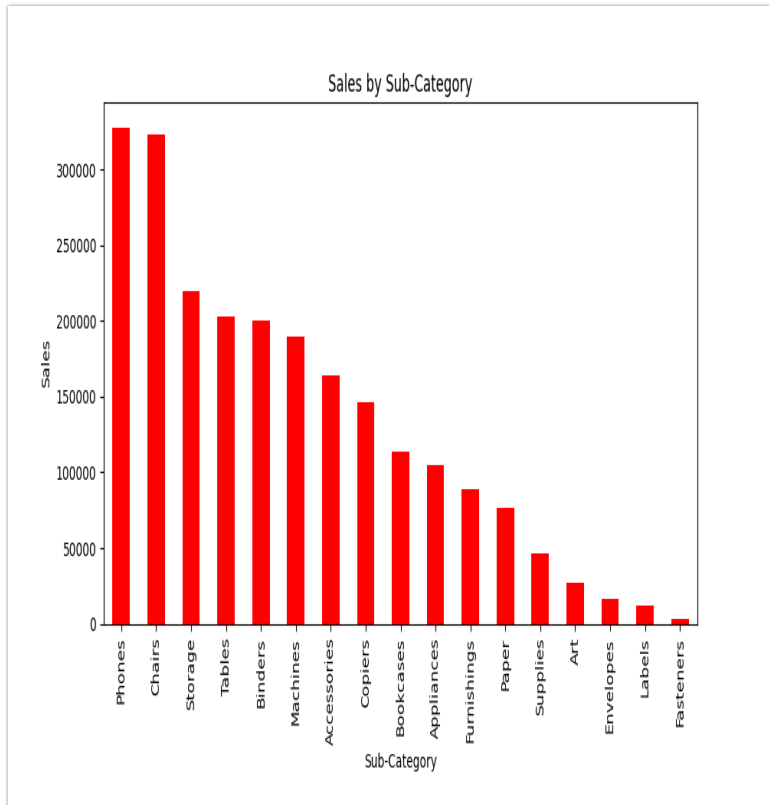

```python
# إجمالي المبيعات لكل فئة فرعية
sub_category_sales = df.groupby('Sub-Category')['Sales'].sum().sort_values(ascending=False)
print(sub_category_sales)


# رسم بياني لأداء المبيعات حسب الفئات الفرعية
plt.figure(figsize=(10, 6))
sub_category_sales.plot(kind='bar', color='red')
plt.title('Sales by Sub-Category')
plt.ylabel('Sales')
plt.xlabel('Sub-Category')
plt.xticks(rotation=90)
plt.show()
```

Purpose: To assess the performance of product subcategories.

Benefit: It helped identify which subcategories were driving sales, informing decisions on product focus and inventory allocation.

7- What are the best-selling products?
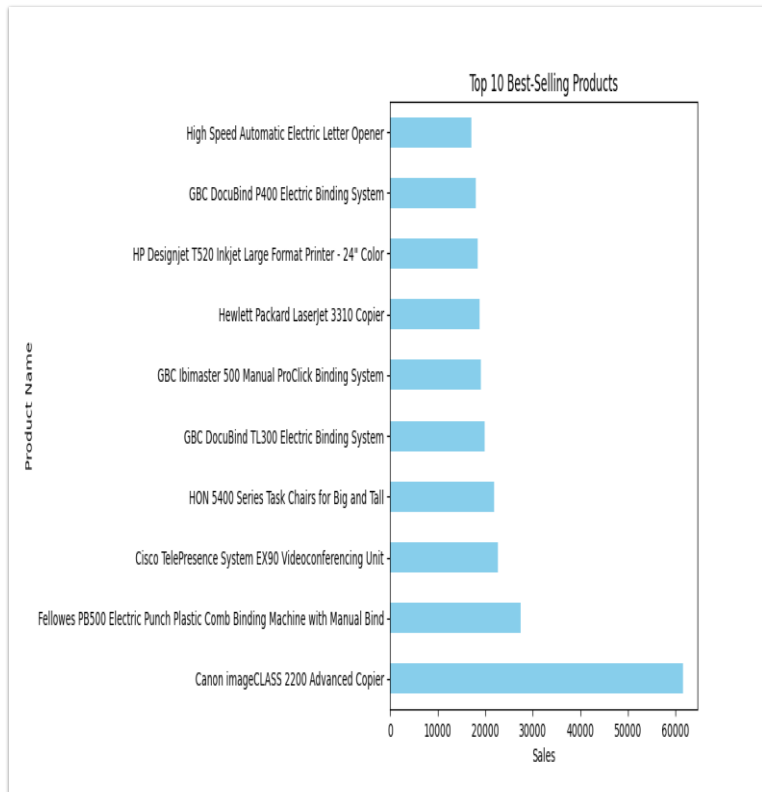

```python
# أعلى 10 منتجات مبيعًا
top_products = df.groupby('Product Name')['Sales'].sum().nlargest(10)

# رسم بياني عمودي لمبيعات المنتجات
plt.figure(figsize=(12, 6))
top_products.plot(kind='barh', color='skyblue')
plt.title('Top 10 Best-Selling Products')
plt.xlabel('Sales')
plt.ylabel('Product Name')
plt.show()
```

Purpose: To identify the top-selling products in the dataset.

Benefit: This chart provided insights into which products are most popular among customers, enabling the organization to focus on promoting these items further and ensuring adequate stock levels.

# 8- What is the distribution of sales by category?
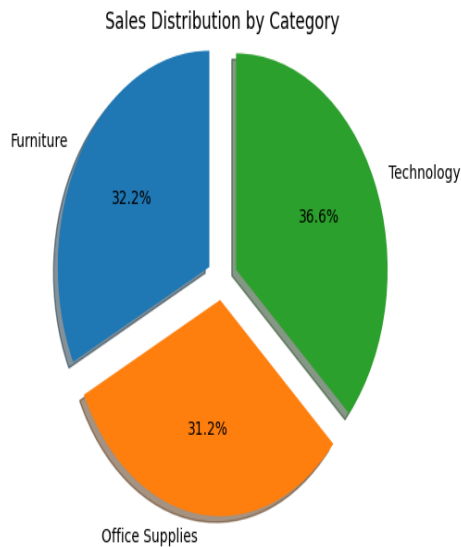

```python
# حساب إجمالي المبيعات لكل فئة
category_sales = df.groupby('Category')['Sales'].sum()

# رسم بياني دائري لتوزيع المبيعات حسب الفئات
plt.figure(figsize=(10, 8))
plt.pie(
    category_sales,
    labels=category_sales.index,
    autopct='%1.1f%%',
    startangle=90,
    explode=[0.1] * len(category_sales),  # تفجير القطع لزيادة الوضوح
    shadow=True
)
plt.title('Sales Distribution by Category')
plt.axis('equal')  # لضمان أن المخطط دائري
plt.show()
```

Purpose: To analyze the overall sales distribution across different product categories.

Benefit: This chart helped to visualize which categories contribute the most to total sales, allowing decision-makers to allocate marketing resources effectively and prioritize product development in high-performing categories.

9- What is the distribution of sales by region?
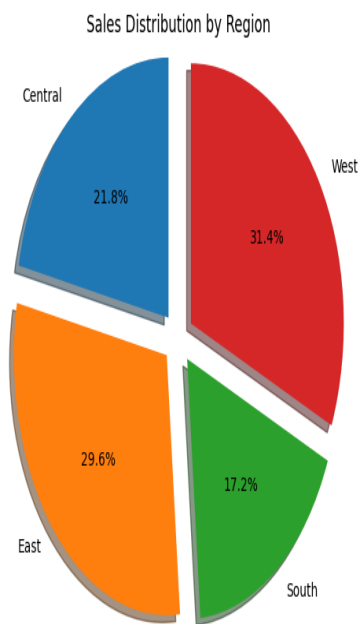

```python
# حساب إجمالي المبيعات لكل منطقة
region_sales = df.groupby('Region')['Sales'].sum()

# رسم بياني دائري لتوزيع المبيعات حسب المناطق
plt.figure(figsize=(10, 8))
plt.pie(
    region_sales,
    labels=region_sales.index,
    autopct='%1.1f%%',
    startangle=90,
    explode=[0.1] * len(region_sales),  # تفجير القطع لزيادة الوضوح
    shadow=True
)
plt.title('Sales Distribution by Region')
plt.axis('equal')  # لضمان أن المخطط دائري
plt.show()
```

Purpose: To examine the sales distribution among various regions.

Benefit: This chart enabled the identification of geographic trends in sales performance, providing valuable information for regional sales strategies and identifying areas that may require more attention or resources.