amazon-sales-analysis

May 28, 2024

[1]:
```
import pandas as pd
```

[2]:
```
data=pd.read_csv(r"C:\Users\pc\Downloads\Amazon Sales data.csv")
```

[3]:
```
#convert 'Order Date' and 'Ship Date' to datetime
data['Order Date']=pd.to_datetime(data['Order Date'])
data['Ship Date']=pd.to_datetime(data['Ship Date'])
```

[4]:
```
# Extract year and month from 'Order Date'
data['Order Year'] = data['Order Date'].dt.year
data['Order Month'] = data['Order Date'].dt.month
```

[5]:
```
# Create a year-month column for yearly_month-wise analysis
data['Year_Month'] = data['Order Date'].dt.to_period('M')
```

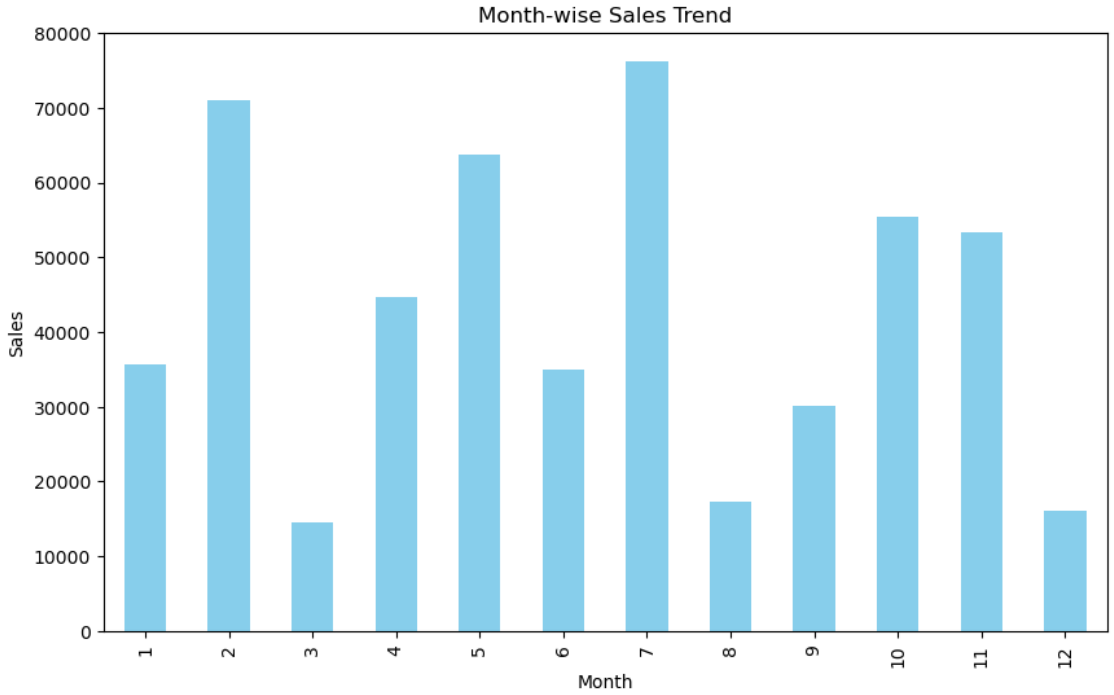
[6]:
```
# Check for and handle missing values if necessary
data = data.dropna()
```

[7]:
```
# Optionally, create additional columns like 'Revenue' or 'Gross Profit'
data['Revenue'] = data['Units Sold'] * data['Unit Price']
```

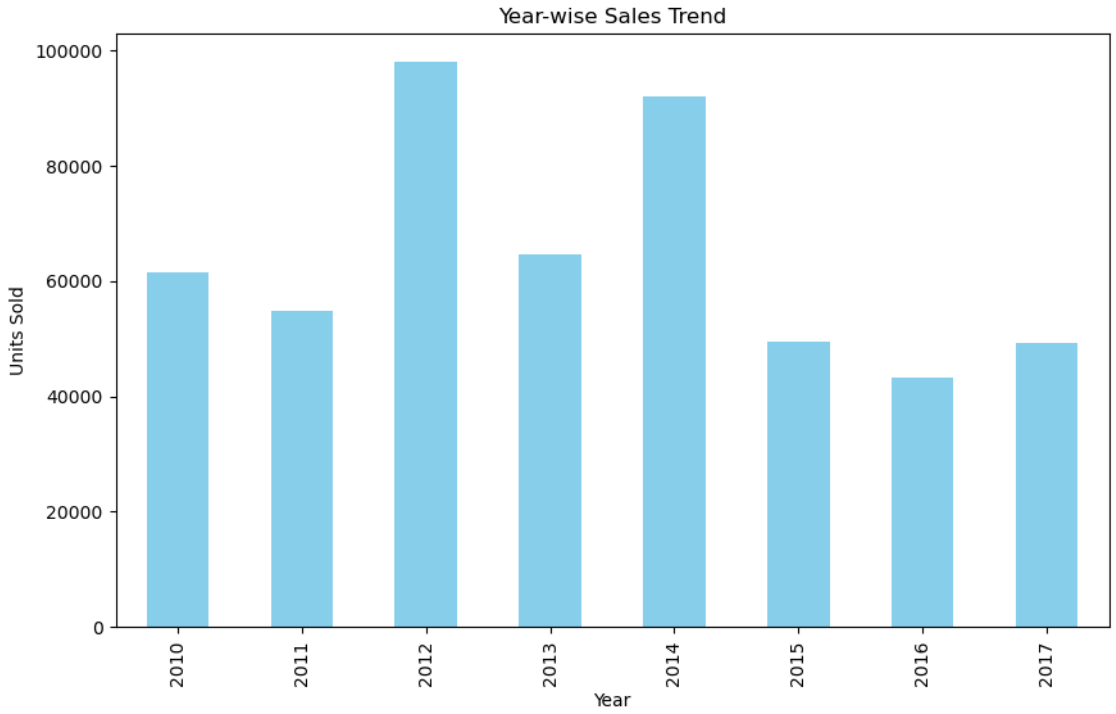
1 Analysis

Sales Trend Analysis We will analyze the sales trends month-wise, year-wise, and yearly-month-wise.

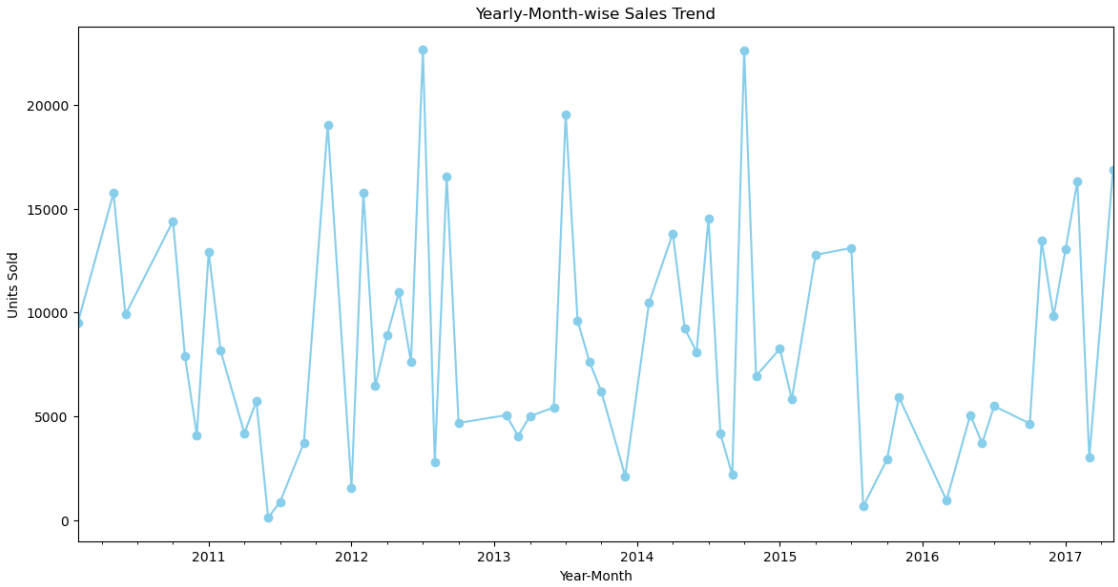
[8]:
```
import matplotlib.pyplot as plt

# Month-wise sales trend
month_wise_sales = data.groupby('Order Month')['Units Sold'].sum()
plt.figure(figsize=(10, 6))
month_wise_sales.plot(kind='bar', color='skyblue')
plt.title('Month-wise Sales Trend')
plt.xlabel('Month')
plt.ylabel('Sales')
plt.show()
```



[9]:
```
# Year-wise sales trend
year_wise_sales = data.groupby('Order Year')['Units Sold'].sum()
plt.figure(figsize=(10, 6))
year_wise_sales.plot(kind='bar', color='skyblue')
plt.title('Year-wise Sales Trend')
plt.xlabel('Year')
plt.ylabel('Units Sold')
plt.show()
```



[10]:
```
# Yearly-Month-wise sales trend
yearly_month_wise_sales = data.groupby('Year_Month')['Units Sold'].sum()
plt.figure(figsize=(14, 7))
yearly_month_wise_sales.plot(kind='line', marker='o', color='skyblue')
plt.title('Yearly-Month-wise Sales Trend')
plt.xlabel('Year-Month')
plt.ylabel('Units Sold')
plt.show()
```



Key Metrics and Relationships To find key metrics and relationships between attributes, we can use correlation analysis and descriptive statistics.

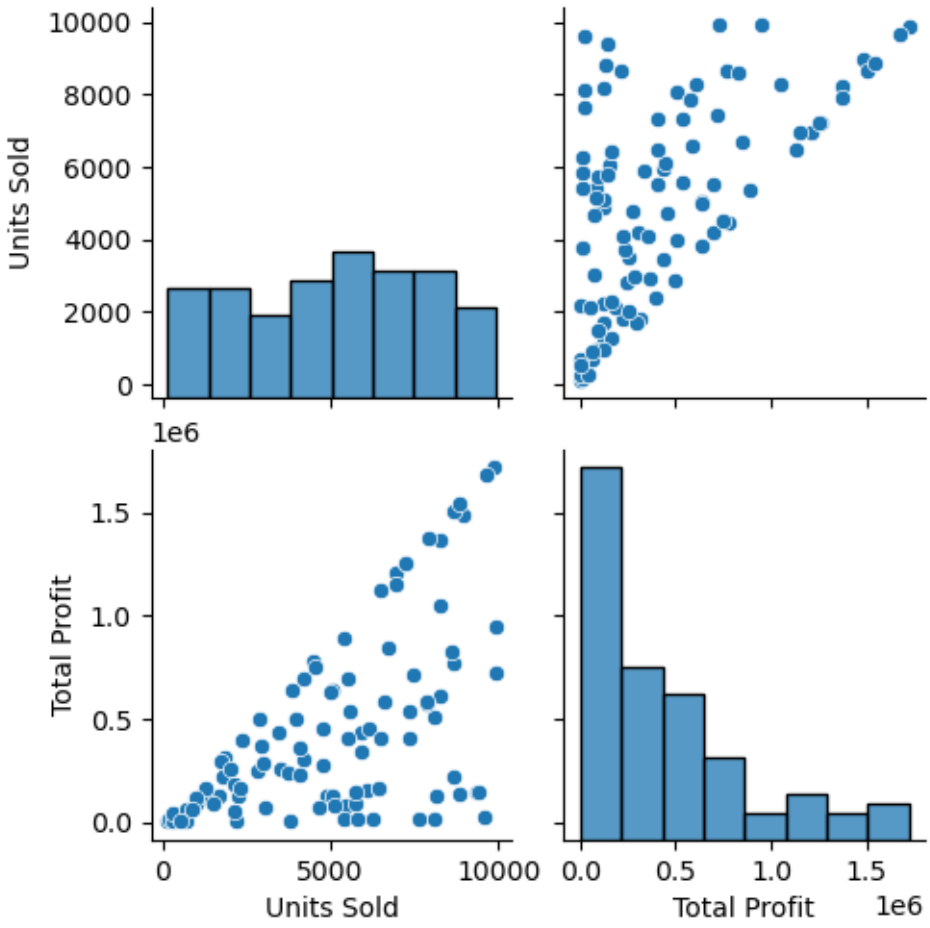
[11]:
```
# Correlation matrix
correlation_matrix = data.corr()
print(correlation_matrix)

# Pairplot to visualize relationships
import seaborn as sns
sns.pairplot(data[['Units Sold',  'Sales Channel', 'Total Profit','Item Type']])
plt.show()

# Descriptive statistics
descriptive_stats = data.describe()
print(descriptive_stats)
```

```
C:\Users\pc\AppData\Local\Temp\ipykernel_9404\3757211721.py:2: FutureWarning:
The default value of numeric_only in DataFrame.corr is deprecated. In a future
version, it will default to False. Select only valid columns or specify the
value of numeric_only to silence this warning.
  correlation_matrix = data.corr()
```

	Order ID	Units Sold	Unit Price	Unit Cost	Total Revenue	\
Order ID	1.000000	-0.222907	-0.190941	-0.213201	-0.314688	
Units Sold	-0.222907	1.000000	-0.070486	-0.092232	0.447784	
Unit Price	-0.190941	-0.070486	1.000000	0.987270	0.752360	
Unit Cost	-0.213201	-0.092232	0.987270	1.000000	0.715623	
Total Revenue	-0.314688	0.447784	0.752360	0.715623	1.000000	
Total Cost	-0.328944	0.374746	0.787905	0.774895	0.983928	

```
Total Profit  -0.234638    0.564550    0.557365   0.467214       0.897327
Order Year     0.081752    0.012455   -0.061791  -0.071567      -0.037128
Order Month   -0.111219   -0.007995   -0.031917  -0.042016       0.003835
Revenue       -0.314688    0.447784    0.752360   0.715623       1.000000
```

	Total Cost	Total Profit	Order Year	Order Month	Revenue
Order ID	-0.328944	-0.234638	0.081752	-0.111219	-0.314688
Units Sold	0.374746	0.564550	0.012455	-0.007995	0.447784
Unit Price	0.787905	0.557365	-0.061791	-0.031917	0.752360
Unit Cost	0.774895	0.467214	-0.071567	-0.042016	0.715623
Total Revenue	0.983928	0.897327	-0.037128	0.003835	1.000000
Total Cost	1.000000	0.804091	-0.050899	-0.015617	0.983928
Total Profit	0.804091	1.000000	0.002196	0.051366	0.897327
Order Year	-0.050899	0.002196	1.000000	-0.106715	-0.037128
Order Month	-0.015617	0.051366	-0.106715	1.000000	0.003835
Revenue	0.983928	0.897327	-0.037128	0.003835	1.000000




```
Order ID   Units Sold  Unit Price   Unit Cost  Total Revenue  \
```

```
count  1.000000e+02   100.000000  100.000000  100.000000   1.000000e+02
mean   5.550204e+08  5128.710000  276.761300  191.048000   1.373488e+06
std    2.606153e+08  2794.484562  235.592241  188.208181   1.460029e+06
min    1.146066e+08   124.000000    9.330000    6.920000   4.870260e+03
25%    3.389225e+08  2836.250000   81.730000   35.840000   2.687212e+05
50%    5.577086e+08  5382.500000  179.880000  107.275000   7.523144e+05
75%    7.907551e+08  7369.000000  437.200000  263.330000   2.212045e+06
max    9.940222e+08  9925.000000  668.270000  524.960000   5.997055e+06
```

```
         Total Cost  Total Profit   Order Year  Order Month       Revenue
count  1.000000e+02  1.000000e+02   100.000000   100.000000  1.000000e+02
mean   9.318057e+05  4.416820e+05  2013.230000     6.260000  1.373488e+06
std    1.083938e+06  4.385379e+05     2.088231     3.353334  1.460029e+06
min    3.612240e+03  1.258020e+03  2010.000000     1.000000  4.870260e+03
25%    1.688680e+05  1.214436e+05  2012.000000     4.000000  2.687212e+05
50%    3.635664e+05  2.907680e+05  2013.000000     6.000000  7.523144e+05
75%    1.613870e+06  6.358288e+05  2015.000000     9.250000  2.212045e+06
max    4.509794e+06  1.719922e+06  2017.000000    12.000000  5.997055e+06
```

##Key Metrics We will calculate total sales, average sales per order

[22]:
```
# Key Metrics
total_sales = data['Units Sold'].sum()
average_sales_per_order = data['Units Sold'].mean()
total_Total_cost = data['Total Cost'].sum()
total_profit = data['Total Profit'].sum()

print(f"Total Sales: {total_sales}")
print(f"Average Sales per Order: {average_sales_per_order}")

print(f"Total Profit: ${total_profit:,.2f}")
```

```
Total Sales: 512871
Average Sales per Order: 5128.71
Total Profit: $44,168,198.40
```

[ ]:
```

```