Sales data Analysis

OBJECTIVES:

- importing zipdata and creating a dataframe
- figuring out optimal data visualization formats to visualize data
- Applying Data Visualization
- Creating interactive dashboard or tables and charts to better explain dataset

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

Sales_data = pd.read_csv('/content/Sales data/retail_sales_dataset.csv')
```

```
Sales_data.head()
```

	Transaction ID	Date	Customer ID	Gender	Age	Product Category	Quantity	Price per Unit	Total Amount
0	1	2023-11-24	CUST001	Male	34	Beauty	3	50	150
1	2	2023-02-27	CUST002	Female	26	Clothing	2	500	1000
2	3	2023-01-13	CUST003	Male	50	Electronics	1	30	30
3	4	2023-05-21	CUST004	Male	37	Clothing	1	500	500
4	5	2023-05-06	CUST005	Male	30	Beauty	2	50	100

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

Checking for null values

```
Sales_data.isna().sum()
```

	0
Transaction ID	0
Date	0
Customer ID	0
Gender	0
Age	0
Product Category	0
Quantity	0
Price per Unit	0
Total Amount	0

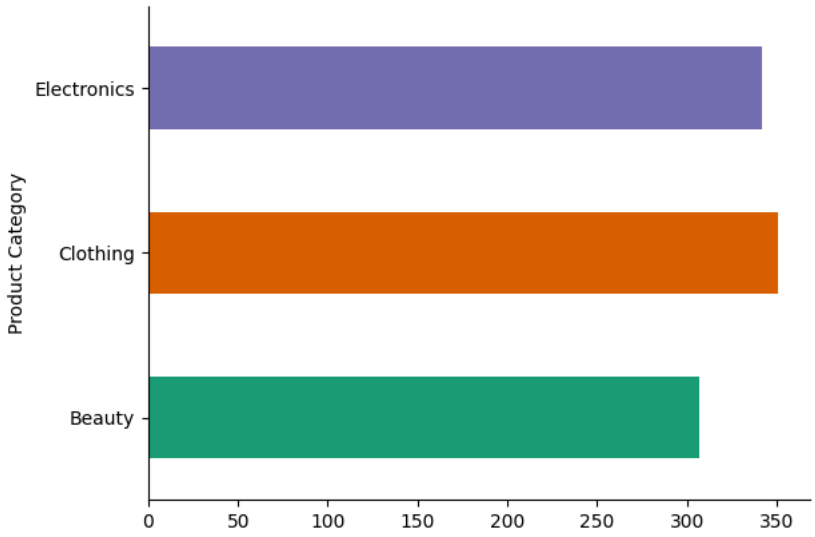
dtype: int64

```
Table has no null values so we can move ahead to data visualization

**Checking what category of product sells the most**
```

Table has no null values so we can move ahead to data visualization

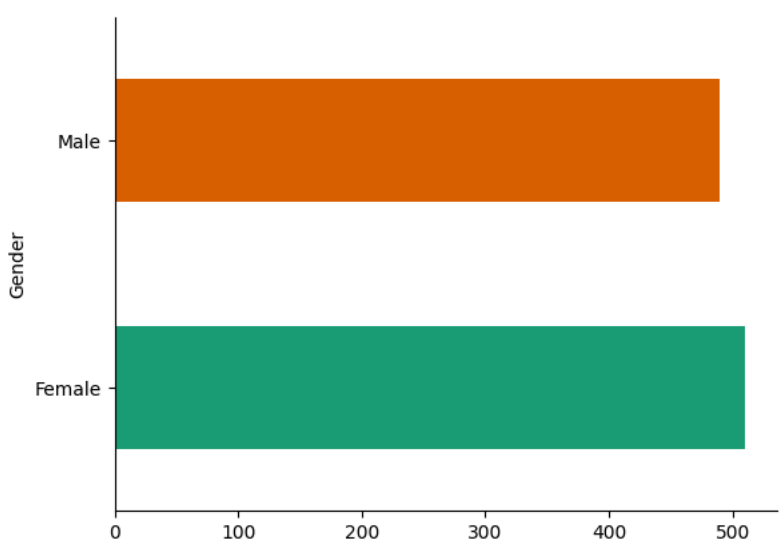
Checking what category of product sells the most

```
Sales_data.groupby('Product Category').size().plot(kind='barh', color=sns.palettes.mpl_palette('Dark2'))
plt.gca().spines[['top', 'right',]].set_visible(False)
```



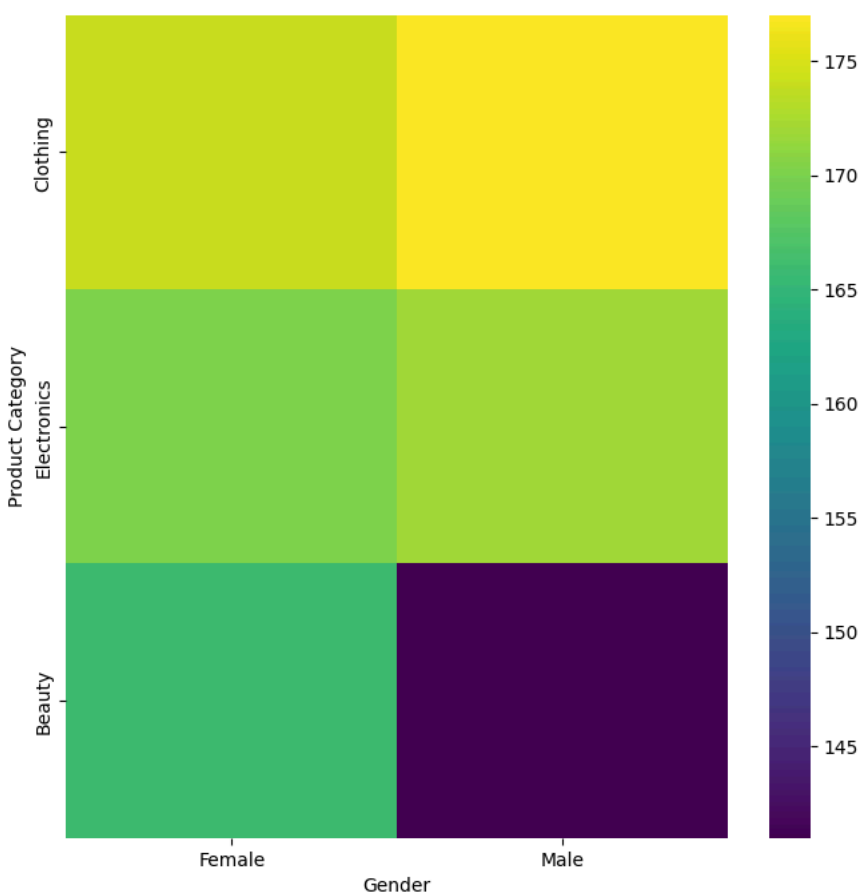
Checking Which Gender Buys the most products

```
Sales_data.groupby('Gender').size().plot(kind='barh', color=sns.palettes.mpl_palette('Dark2'))
plt.gca().spines[['top', 'right',]].set_visible(False)
```



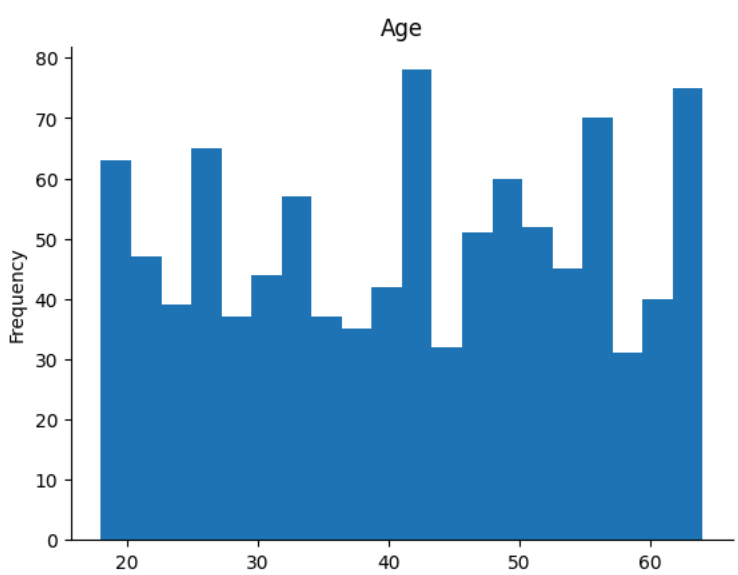
Mapping Sales product category for each Gender

```
plt.subplots(figsize=(8, 8))
df_2dhist = pd.DataFrame({
    x_label: grp['Product Category'].value_counts()
    for x_label, grp in Sales_data.groupby('Gender')
})
sns.heatmap(df_2dhist, cmap='viridis')
plt.xlabel('Gender')
_ = plt.ylabel('Product Category')
```



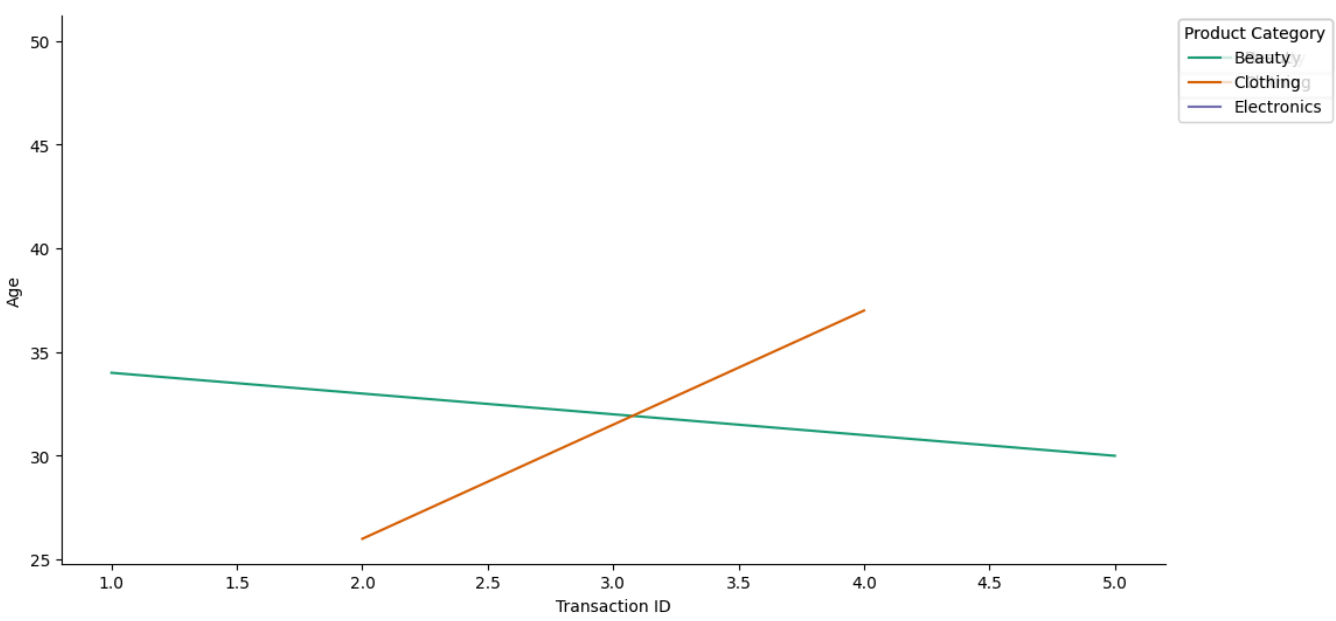
Age vs Buying Frequency

```
Sales_data['Age'].plot(kind='hist', bins=20, title='Age')
plt.gca().spines[['top', 'right',]].set_visible(False)
```



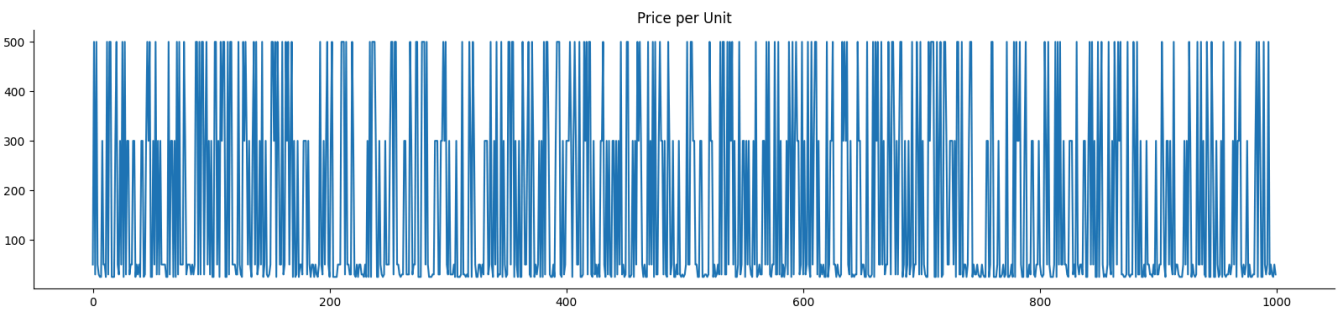

```
def _plot_series(series, series_name, series_index=0):
  palette = list(sns.palettes.mpl_palette('Dark2'))
  xs = series['Transaction ID']
  ys = series['Age']

  plt.plot(xs, ys, label=series_name, color=palette[series_index % len(palette)])

fig, ax = plt.subplots(figsize=(10, 5.2), layout='constrained')
df_sorted = _df_42.sort_values('Transaction ID', ascending=True)
for i, (series_name, series) in enumerate(df_sorted.groupby('Product Category')):
  _plot_series(series, series_name, i)
  fig.legend(title='Product Category', bbox_to_anchor=(1, 1), loc='upper left')
sns.despine(fig=fig, ax=ax)
```

```
plt.xlabel('Transaction ID')
_ = plt.ylabel('Age')
```



Price per Unit of Products

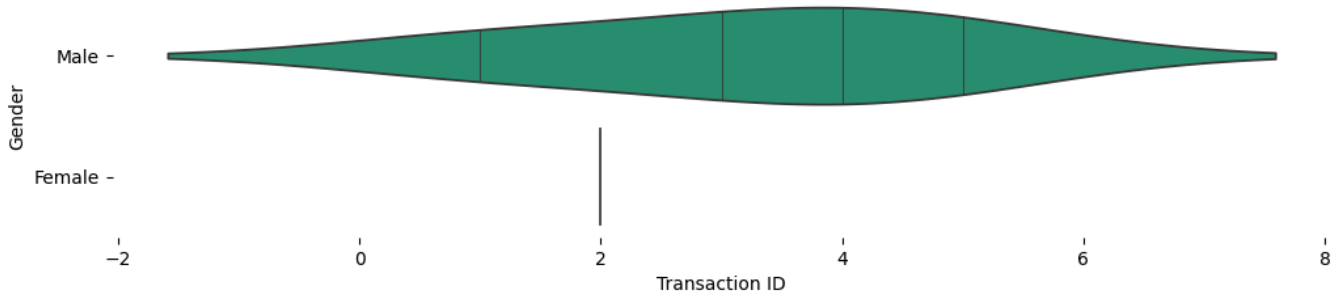
```
Sales_data['Price per Unit'].plot(kind='line', figsize=(20, 4), title='Price per Unit')
plt.gca().spines[['top', 'right']].set_visible(False)
```



Gender Vs Transaction ID

```
figsize = (12, 1.2 * len(_df_52['Gender'].unique()))
plt.figure(figsize=figsize)
sns.violinplot(_df_52, x='Transaction ID', y='Gender', inner='stick', palette='Dark2')
sns.despine(top=True, right=True, bottom=True, left=True)
```

```
<ipython-input-155-25025927d693>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `le

  sns.violinplot(_df_52, x='Transaction ID', y='Gender', inner='stick', palette='Dark2')
```



Transaction ID vs Product Category

```
figsize = (12, 1.2 * len(_df_53['Product Category'].unique()))
plt.figure(figsize=figsize)
sns.violinplot(_df_53, x='Transaction ID', y='Product Category', inner='stick', palette='Dark2')
sns.despine(top=True, right=True, bottom=True, left=True)
```

```
<ipython-input-156-89f27e2f743b>:3: FutureWarning:

Passing `palette` without assigning `hue` is deprecated and will be removed in v0.14.0. Assign the `y` variable to `hue` and set `le

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```
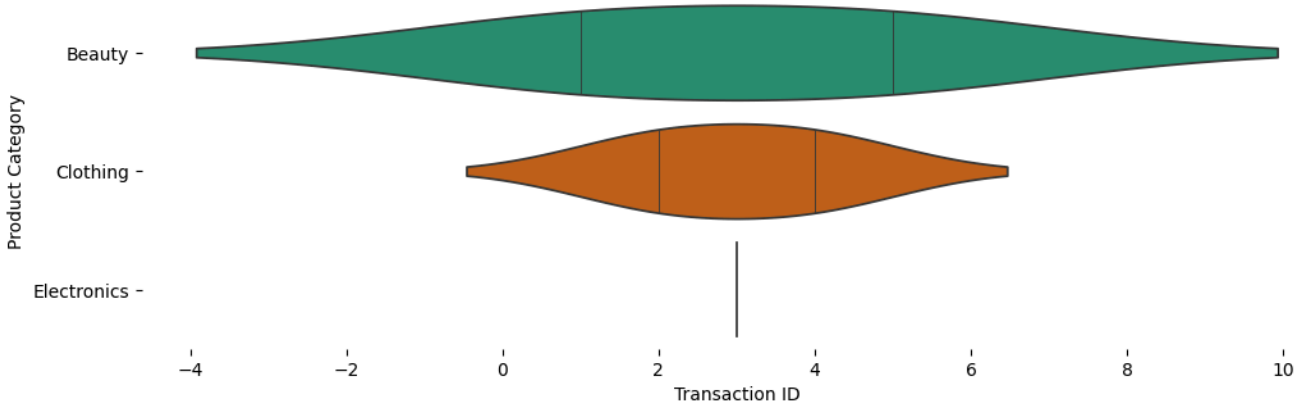
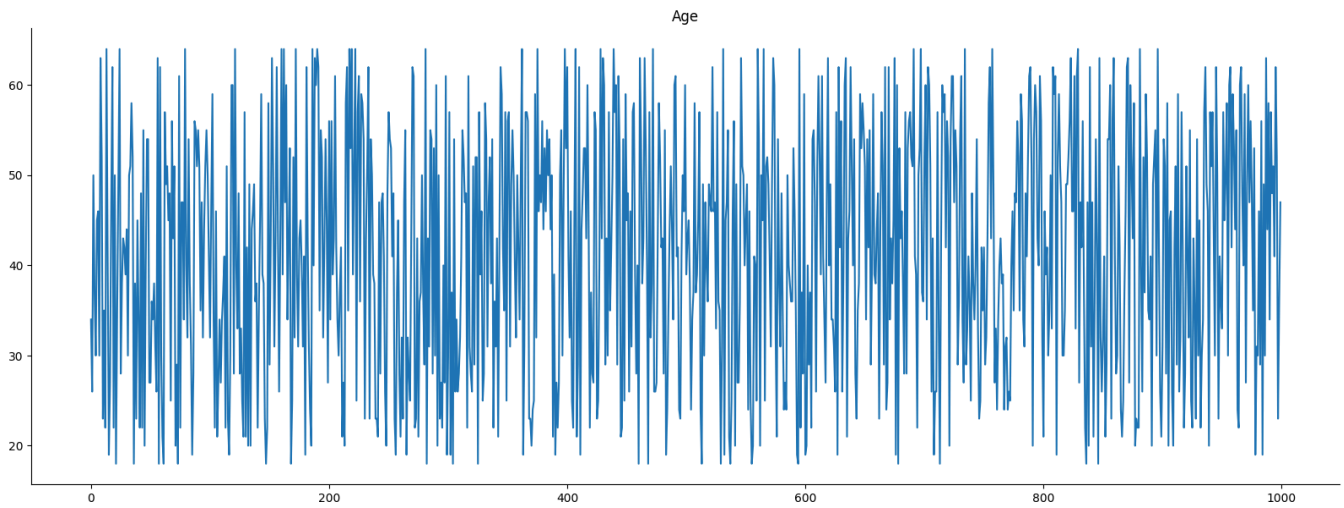



Age vs Quantity Plot

```
from matplotlib import pyplot as plt
Sales_data['Age'].plot(kind='line', figsize=(20, 7), title='Age')
plt.gca().spines[['top', 'right']].set_visible(False)
```



TRANSACTION ID VS AGE

Transaction ID vs Age

```
# @title Transaction ID vs Age

from matplotlib import pyplot as plt
import seaborn as sns
def _plot_series(series, series_name, series_index=0):
  palette = list(sns.palettes.mpl_palette('Dark2'))
  xs = series['Transaction ID']
  ys = series['Age']

  plt.plot(xs, ys, label=series_name, color=palette[series_index % len(palette)])
```

```
  plt.plot(xs, ys, label=series_name, color=palette[series_index % len(palette)])

fig, ax = plt.subplots(figsize=(10, 5.2), layout='constrained')
df_sorted = Sales_data.sort_values('Transaction ID', ascending=True)
for i, (series_name, series) in enumerate(df_sorted.groupby('Gender')):
  _plot_series(series, series_name, i)
  fig.legend(title='Gender', bbox_to_anchor=(1, 1), loc='upper left')
sns.despine(fig=fig, ax=ax)
plt.xlabel('Transaction ID')
_ = plt.ylabel('Age')
```