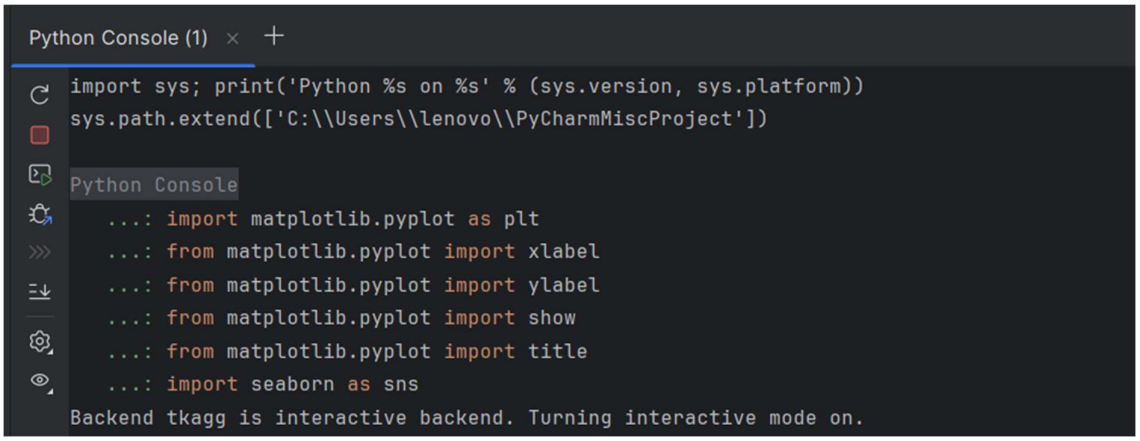
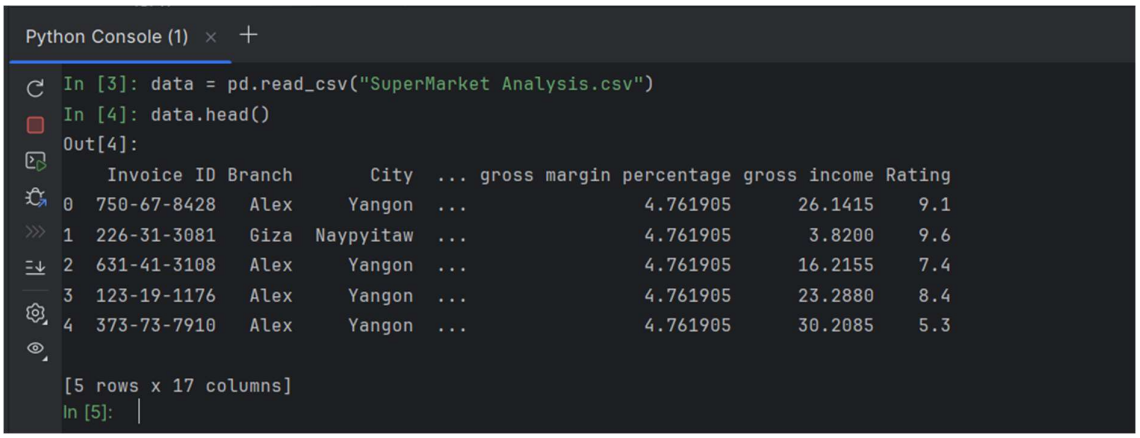
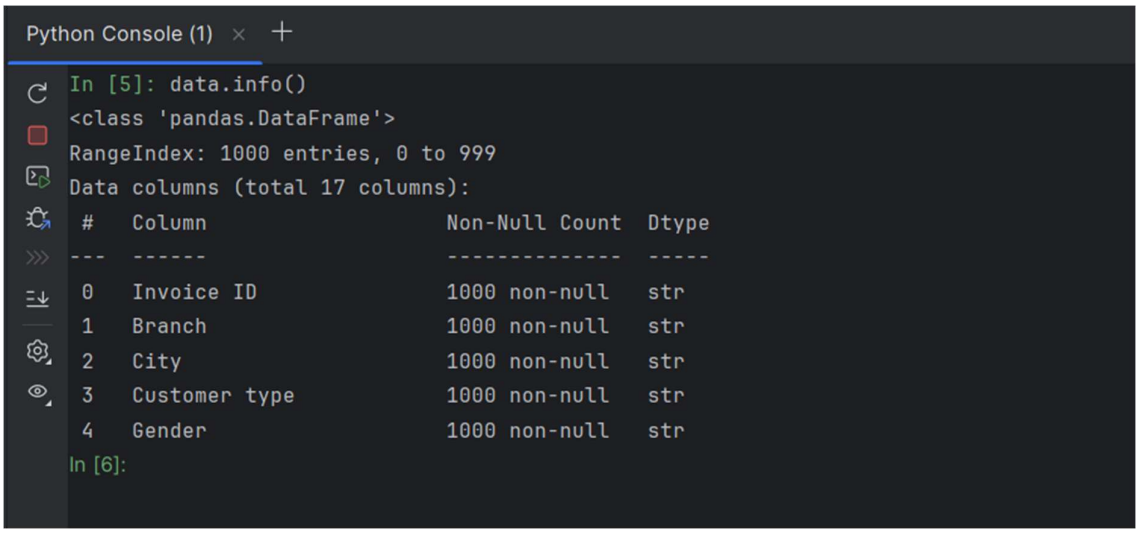
Data Analyst – Internship

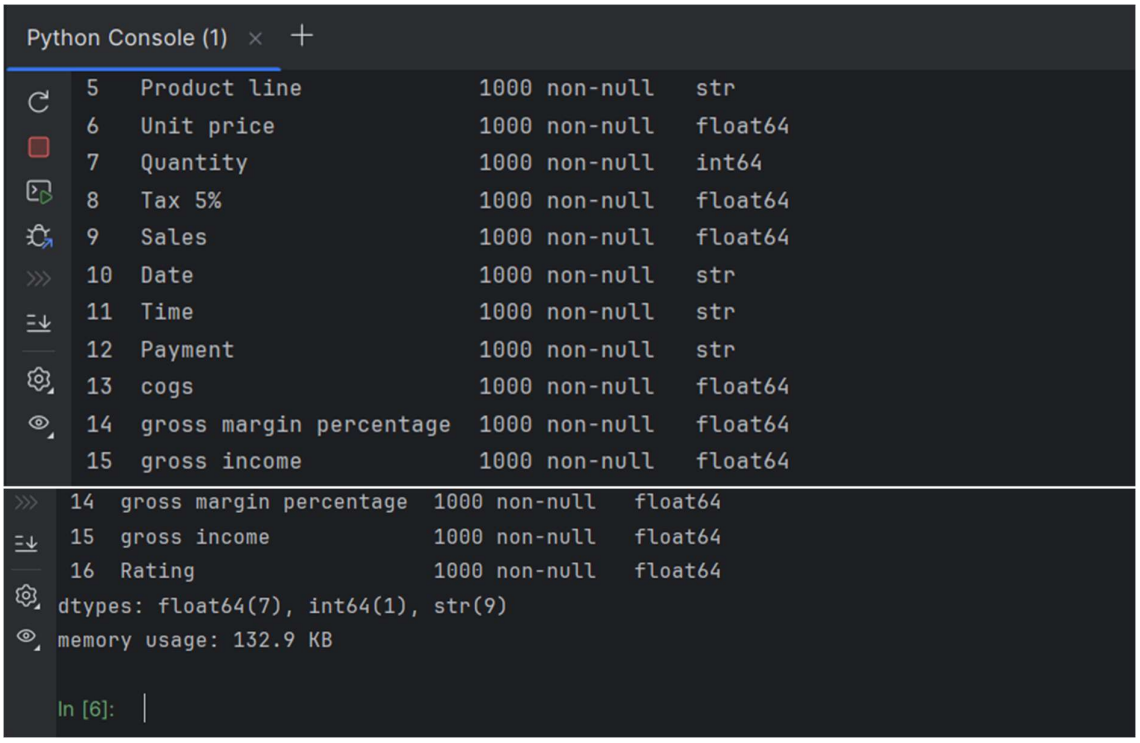
Task 2: SuperMarket Sales Analysis

Step-1: Data Extraction

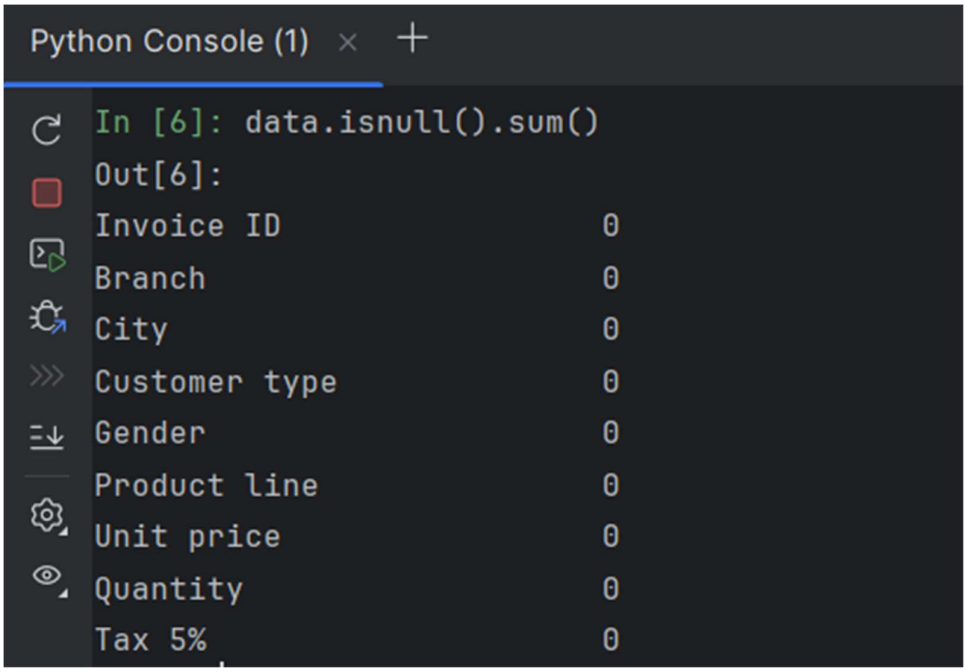








Step-2: Data Cleaning



```
Sales                       0
Date                        0
Time                        0
Payment                     0
cogs                        0
gross margin percentage     0
gross income                0
Rating                      0
dtype: int64

In [7]:
```

Python Console (1)

```
In [7]: data = data.drop_duplicates()
In [8]: data.info()
<class 'pandas.DataFrame'>
RangeIndex: 1000 entries, 0 to 999
Data columns (total 17 columns):
 #   Column                  Non-Null Count  Dtype
---  ------                  --------------  -----
 0   Invoice ID              1000 non-null   str
 1   Branch                  1000 non-null   str
 2   City                    1000 non-null   str
 3   Customer type           1000 non-null   str
 4   Gender                  1000 non-null   str
 5   Product line            1000 non-null   str
```

```
 6   Unit price                1000 non-null   float64
 7   Quantity                  1000 non-null   int64
 8   Tax 5%                    1000 non-null   float64
 9   Sales                     1000 non-null   float64
 10  Date                      1000 non-null   str
 11  Time                      1000 non-null   str
 12  Payment                   1000 non-null   str
 13  cogs                      1000 non-null   float64
 14  gross margin percentage   1000 non-null   float64
 15  gross income              1000 non-null   float64
 16  Rating                    1000 non-null   float64
dtypes: float64(7), int64(1), str(9)
memory usage: 132.9 KB
```

Step-3: Basic Statistical Summary

```
Python Console (1)
In [9]: data.describe()
Out[9]:
       Unit price     Quantity  ...  gross income      Rating
count  1000.000000  1000.000000  ...   1000.000000  1000.00000
mean     55.672130     5.510000  ...     15.379369     6.97270
std      26.494628     2.923431  ...     11.708825     1.71858
min      10.080000     1.000000  ...      0.508500     4.00000
25%      32.875000     3.000000  ...      5.924875     5.50000
50%      55.230000     5.000000  ...     12.088000     7.00000
75%      77.935000     8.000000  ...     22.445250     8.50000
max      99.960000    10.000000  ...     49.650000    10.00000

[8 rows x 8 columns]
```

I have created the variable named **meta_gross_income**, but I mistakenly typed wrong variable name.

```
In [10]: meta_gross_income = data['gross income'].mean()
In [11]: print(f"Average Gross Income: {mean_gross_income:.2f}")
Traceback (most recent call last): Explain with AI
  File "C:\Users\lenovo\PyCharmMiscProject\.venv\Lib\site-packages\IPython\core\interactiveshell.py", line 370
    exec(code_obj, self.user_global_ns, self.user_ns)
  File "<ipython-input-11-9c2a4ec10b2d>", line 1, in <module>
    print(f"Average Gross Income: {mean_gross_income:.2f}")
                                   ^^^^^^^^^^^^^^^^^
NameError: name 'mean_gross_income' is not defined. Did you mean: 'meta_gross_income'?
In [12]: print(f"Average Gross Income: {meta_gross_income:.2f}")
Average Gross Income: 15.38
```

Step-4: Branch-wise Sales Analysis

```
In [13]: branch_sales = data.groupby('Branch')['gross income'].sum()
In [14]: print("Total Gross Income by Branch:\n", branch_sales)
Total Gross Income by Branch:
 Branch
Alex     5057.1605
Cairo    5057.0320
Giza     5265.1765
Name: gross income, dtype: float64
```

```
In [15]: branch_mean = data.groupby('Branch')['gross income'].mean()
In [16]: print("Mean Gross Income by Branch:\n", branch_mean)
Mean Gross Income by Branch:
 Branch
Alex     14.874001
Cairo    15.232024
Giza     16.052367
Name: gross income, dtype: float64
```

```
In [17]: best_branch = branch_mean.idxmax()
In [18]: print(f"The best performing branch is: {best_branch}")
The best performing branch is: Giza
```

Step-5: Category-wise Sales Analysis

```
In [19]: category_sales = data.groupby('Product line')['gross income'].sum().sort_values(ascending=False)
In [20]: print("Gross Income by Product Line:\n", category_sales)
Gross Income by Product Line:
 Product line
Food and beverages        2673.5640
Sports and travel         2624.8965
Electronic accessories    2587.5015
Fashion accessories       2585.9950
Home and lifestyle        2564.8530
Health and beauty         2342.5590
Name: gross income, dtype: float64
```

```
In [21]: top_categories = category_sales.head(3)
In [22]: print("Top 3 Product Lines:\n", top_categories)
Top 3 Product Lines:
 Product line
Food and beverages        2673.5640
Sports and travel         2624.8965
Electronic accessories    2587.5015
Name: gross income, dtype: float64

In [23]:
```

Step-6: Customer and City Sales Analysis

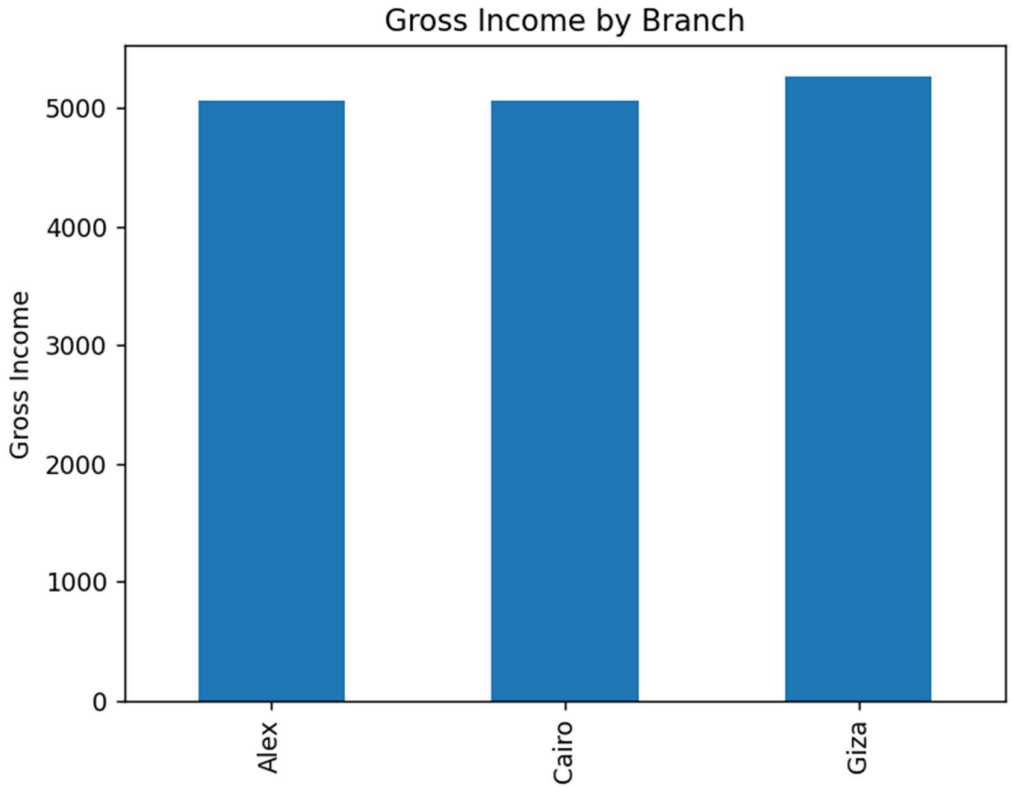
```
In [23]: customer_type_sales = data.groupby('Customer type')['gross income'].sum()
In [24]: print("Gross Income by Customer Type:\n", customer_type_sales)
Gross Income by Customer Type:
 Customer type
Member    9033.084
Normal    6346.285
Name: gross income, dtype: float64
```

```
In [25]: city_sales = data.groupby('City')['gross income'].sum()
In [26]: print("Gross Income by City:\n", city_sales)
Gross Income by City:
 City
Mandalay     5057.0320
Naypyitaw    5265.1765
Yangon       5057.1605
Name: gross income, dtype: float64
```

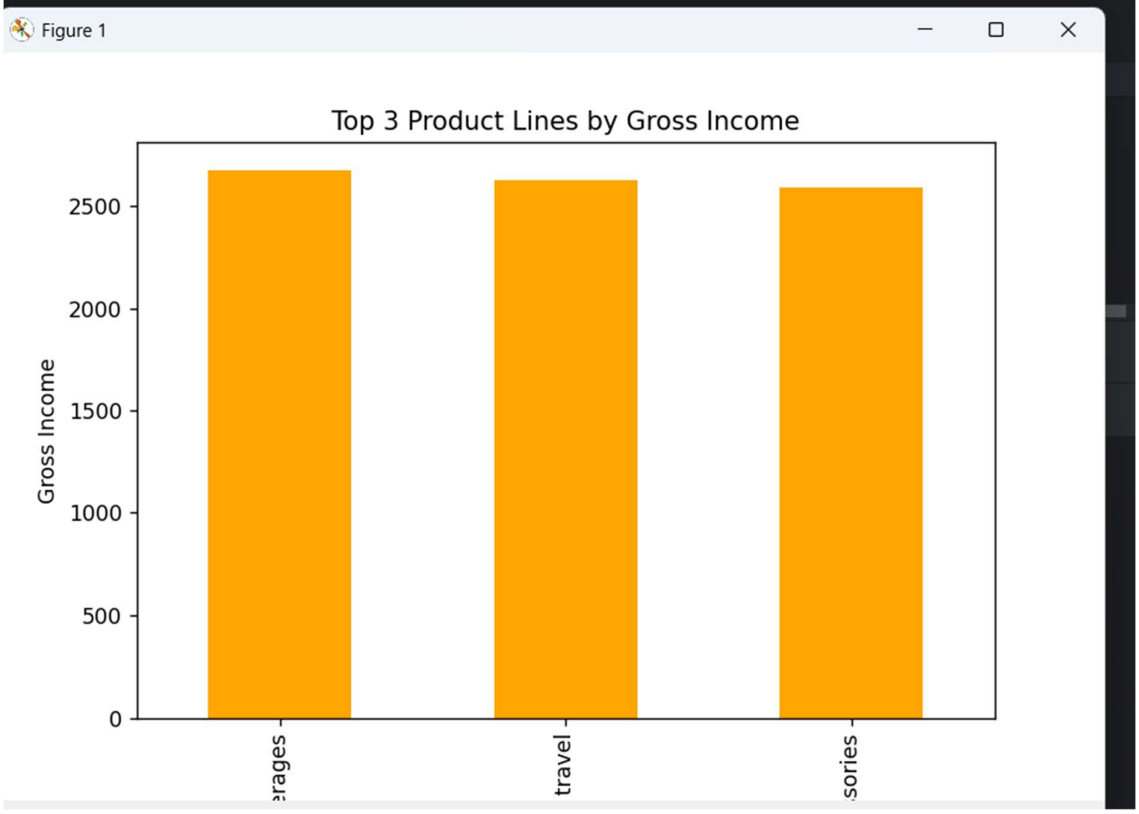
Step-7: Data Visualization

```
branch_sales.plot(kind='bar', title='Gross Income by Branch')
plt.ylabel('Gross Income')
plt.show()
```

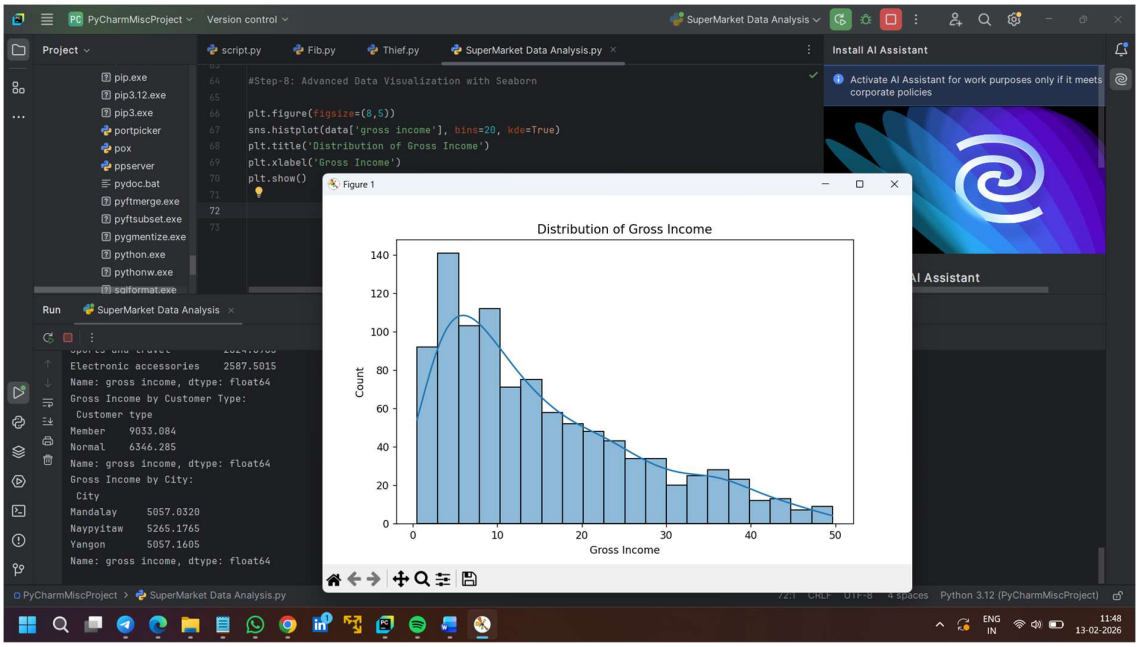
Figure 1

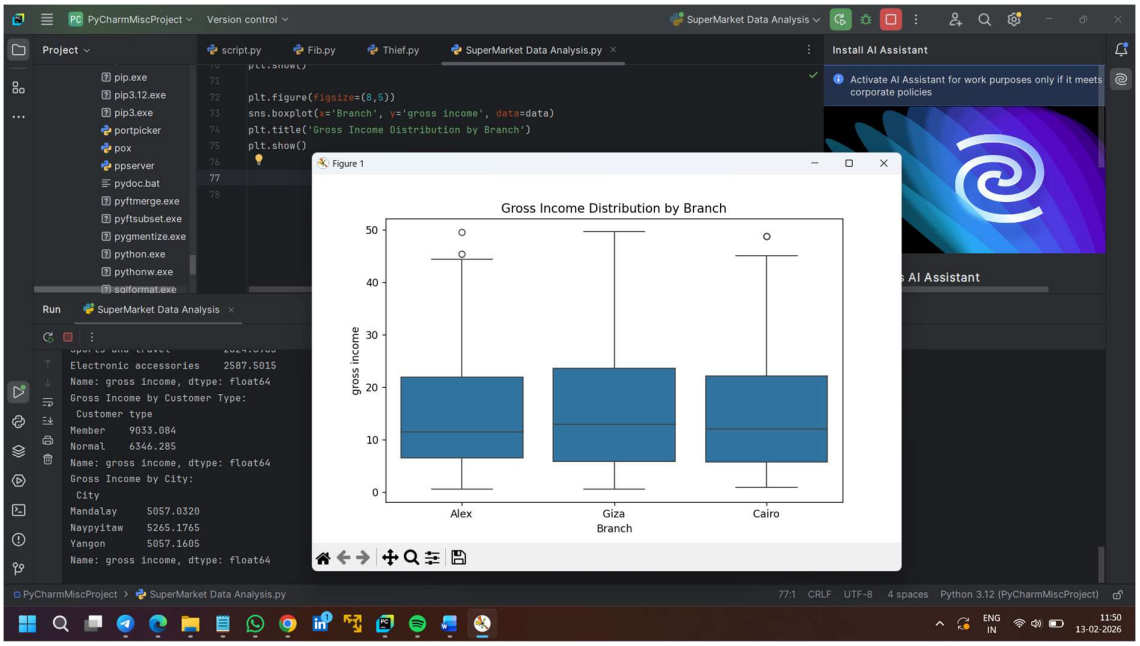


```
top_categories.plot(kind='bar', color='orange', title='Top 3 Product Lines by Gross Income')
plt.ylabel('Gross Income')
plt.show()
```

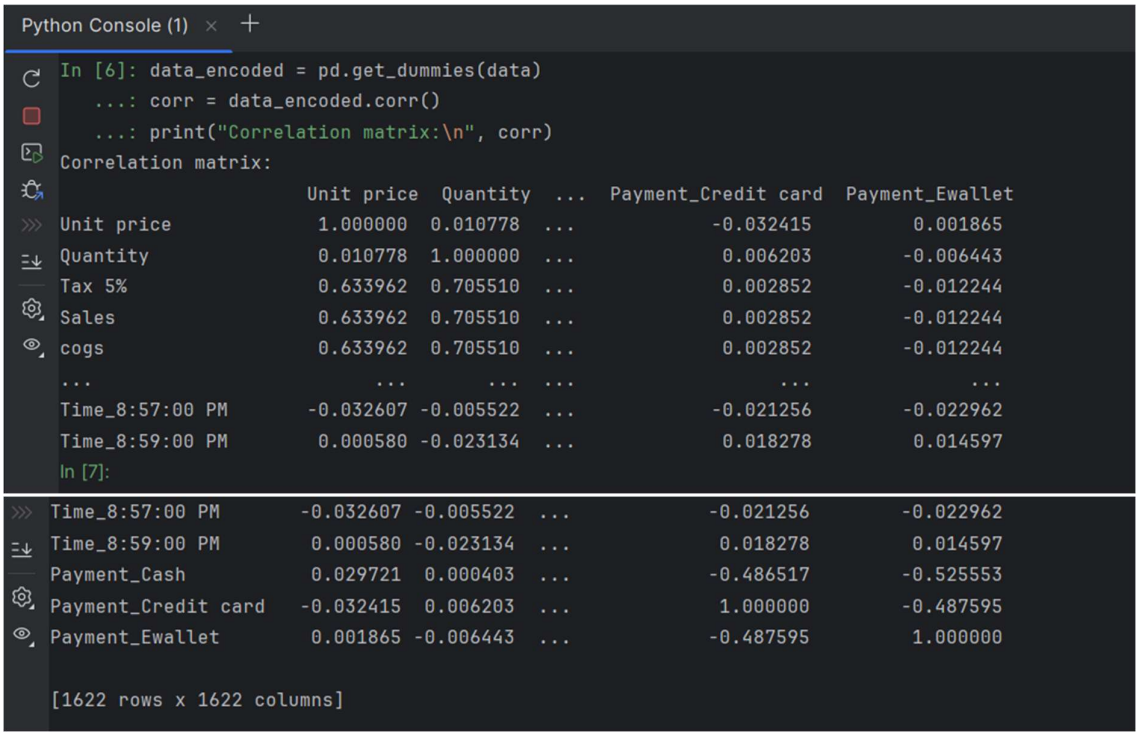


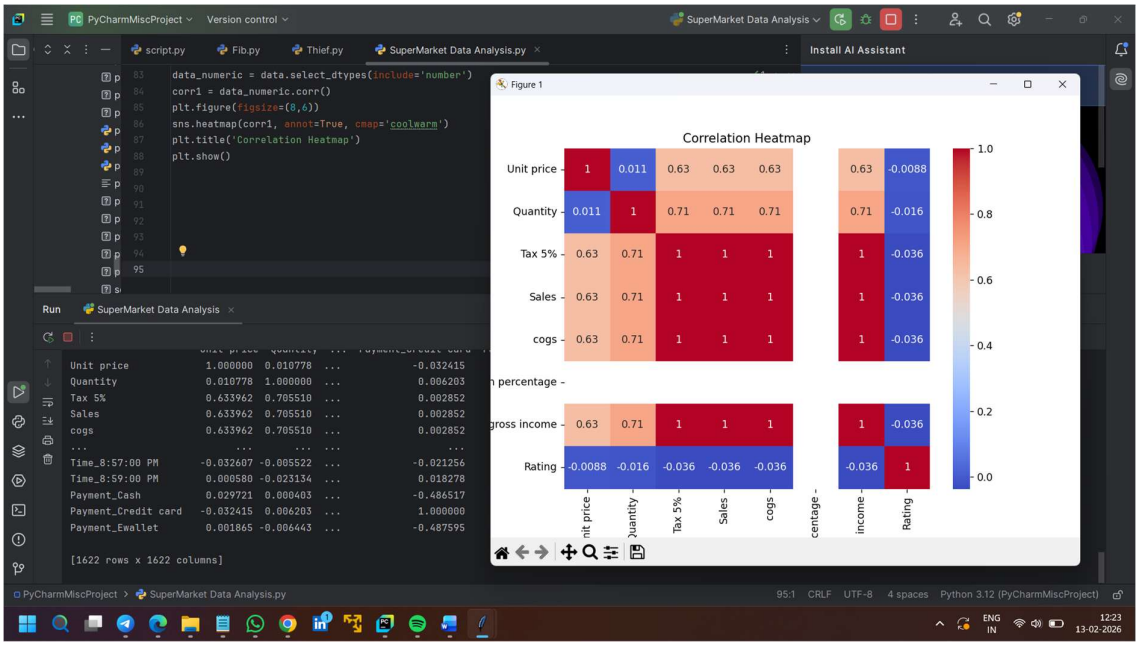
Step-8: Advanced Data Visualization with Seaborn



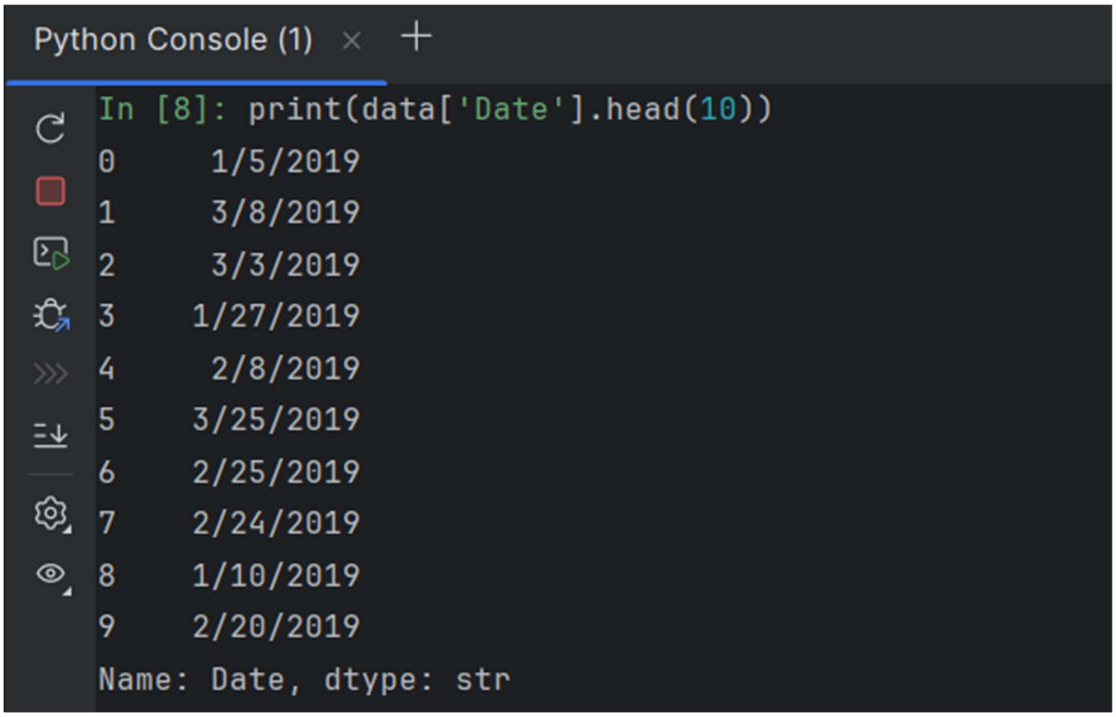


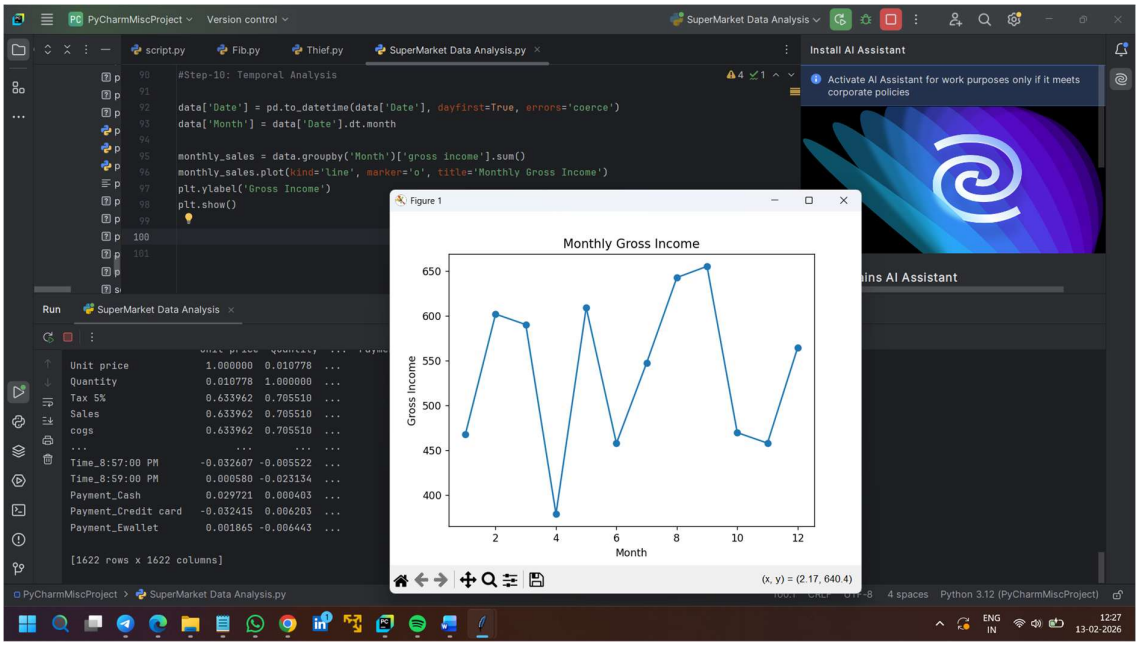
Step-9: Correlation Analysis





Step-10: Temporal Analysis





Step-11: Pivot Table Analysis

```
pivot_table = pd.pivot_table(data, values='gross income', index='Branch', columns='Customer type', aggfunc='sum')
print(pivot_table)
type     Member      Normal

        2995.037  2062.1235
        2848.770  2208.2620
        3189.277  2075.8995
```