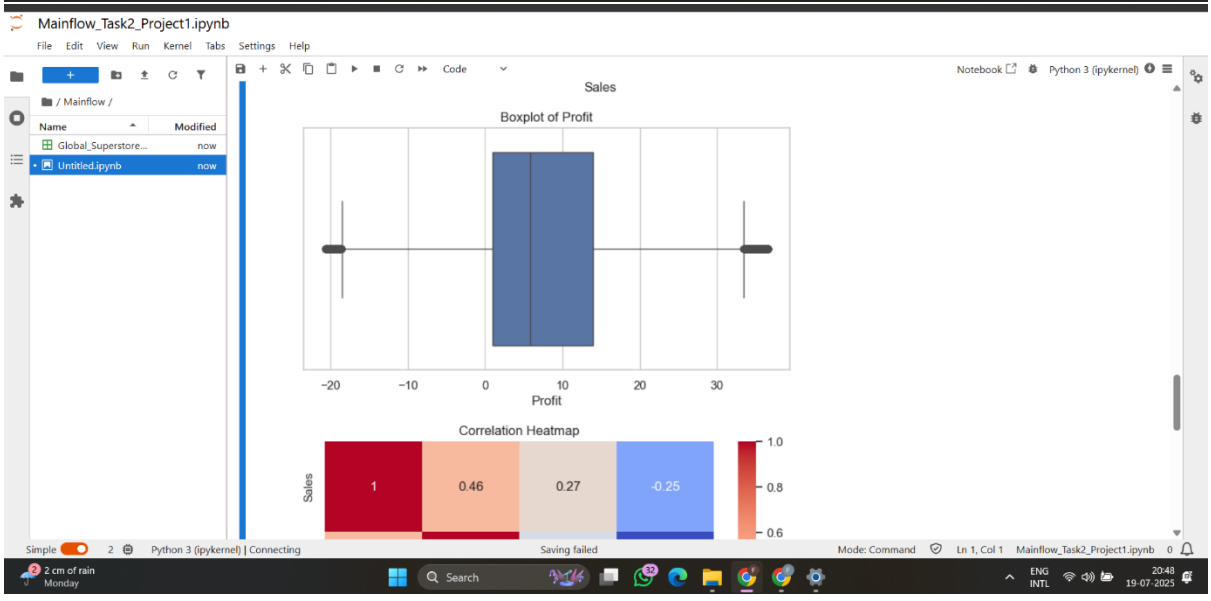
Name:-Faizan Sarfaraz Dandu

Task 2 of Mainflow

Mainflow_Task2_Project1.ipynb

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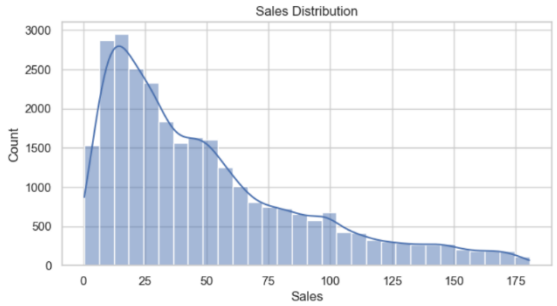
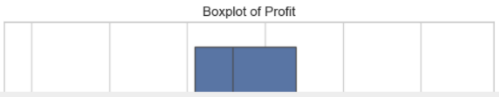
```
plt.title('Correlation Heatmap')
plt.show()
```




Mainflow_Task2_Project1.ipynb

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## 4. Data Visualization

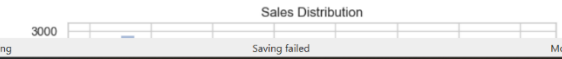
We use various plots to visually explore the data.

- Histogram: Sales Distribution
- Boxplot: Profit Outliers
- Heatmap: Correlation Matrix

[31]:
```
# Histogram: Sales
plt.figure(figsize=(8, 4))
sns.histplot(df['Sales'], bins=30, kde=True)
plt.title('Sales Distribution')
plt.show()

# Boxplot: Profit
plt.figure(figsize=(8, 4))
sns.boxplot(xdf['Profit'])
plt.title('Boxplot of Profit')
plt.show()

# Heatmap: Correlation
plt.figure(figsize=(8, 6))
sns.heatmap(correlation_matrix, annot=True, cmap='coolwarm')
plt.title('Correlation Heatmap')
plt.show()
```




Mainflow_Task2_Project1.ipynb

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```
df = remove_outliers_iqr(df, 'Profit')
```

## 3. Statistical Analysis

We compute mean, median, standard deviation, variance, and correlation to understand the distribution and relationships.

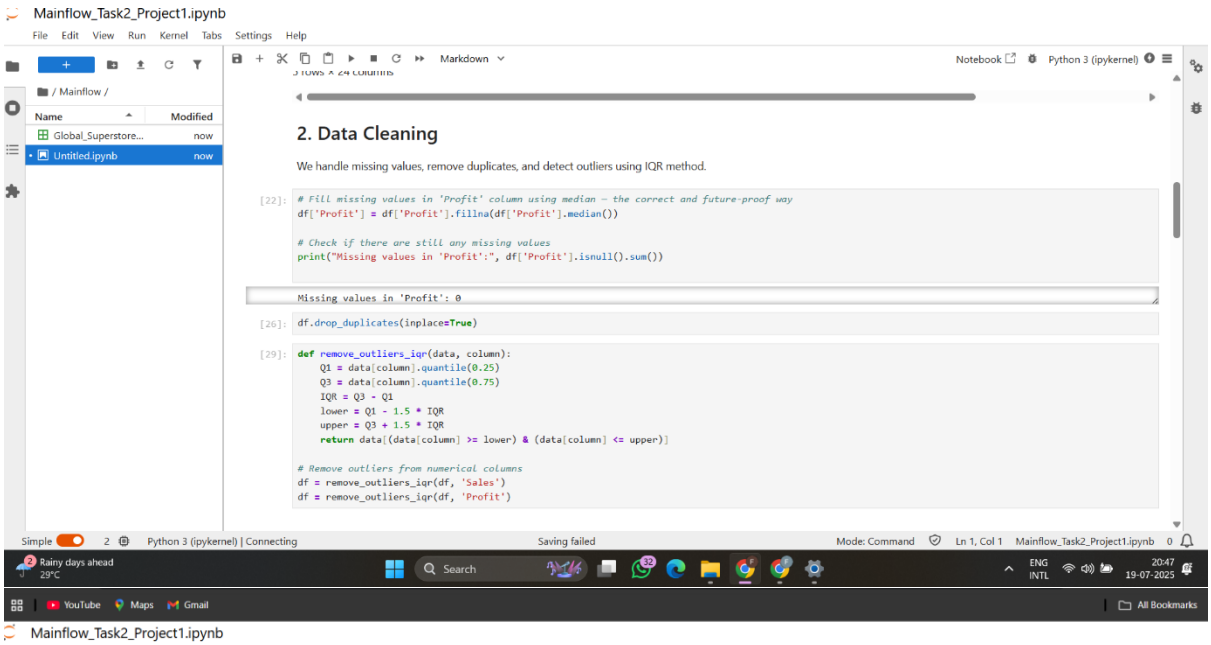
[30]:
```
print("Mean Sales:", df['Sales'].mean())
print("Median Sales:", df['Sales'].median())
print("Standard Deviation (Profit):", df['Profit'].std())
print("Variance (Profit):", df['Profit'].var())

# Correlation Matrix
correlation_matrix = df[['Sales', 'Profit', 'Quantity', 'Discount']].corr()
print(correlation_matrix)
```

```
Mean Sales: 49.60100760342665
Median Sales: 37.86
Standard Deviation (Profit): 11.402201413630221
Variance (Profit): 130.010197076991
              Sales    Profit  Quantity  Discount
Sales      1.000000  0.458194  0.266258 -0.246886
Profit     0.458194  1.000000  0.166251 -0.589744
Quantity   0.266258  0.166251  1.000000 -0.019800
Discount -0.246886 -0.589744 -0.019800  1.000000
```

## 4. Data Visualization

We use various plots to visually explore the data.


Mainflow_Task2_Project1.ipynb
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Markdown
Notebook
Python 3 (ipykernel)
/ Mainflow /
Name
Modified
Global_Superstore...
now
Untitled.ipynb
now
2. Data Cleaning
We handle missing values, remove duplicates, and detect outliers using IQR method.
[22]:
# Fill missing values in 'Profit' column using median — the correct and future-proof way
df['Profit'] = df['Profit'].fillna(df['Profit'].median())
# Check if there are still any missing values
print("Missing values in 'Profit':", df['Profit'].isnull().sum())
Missing values in 'Profit': 0
[26]:
df.drop_duplicates(inplace=True)
[29]:
def remove_outliers_iqr(data, column):
Q1 = data[column].quantile(0.25)
Q3 = data[column].quantile(0.75)
IQR = Q3 - Q1
lower = Q1 - 1.5 * IQR
upper = Q3 + 1.5 * IQR
return data[(data[column] >= lower) & (data[column] <= upper)]
# Remove outliers from numerical columns
df = remove_outliers_iqr(df, 'Sales')
df = remove_outliers_iqr(df, 'Profit')
Simple
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Python 3 (ipykernel) | Connecting
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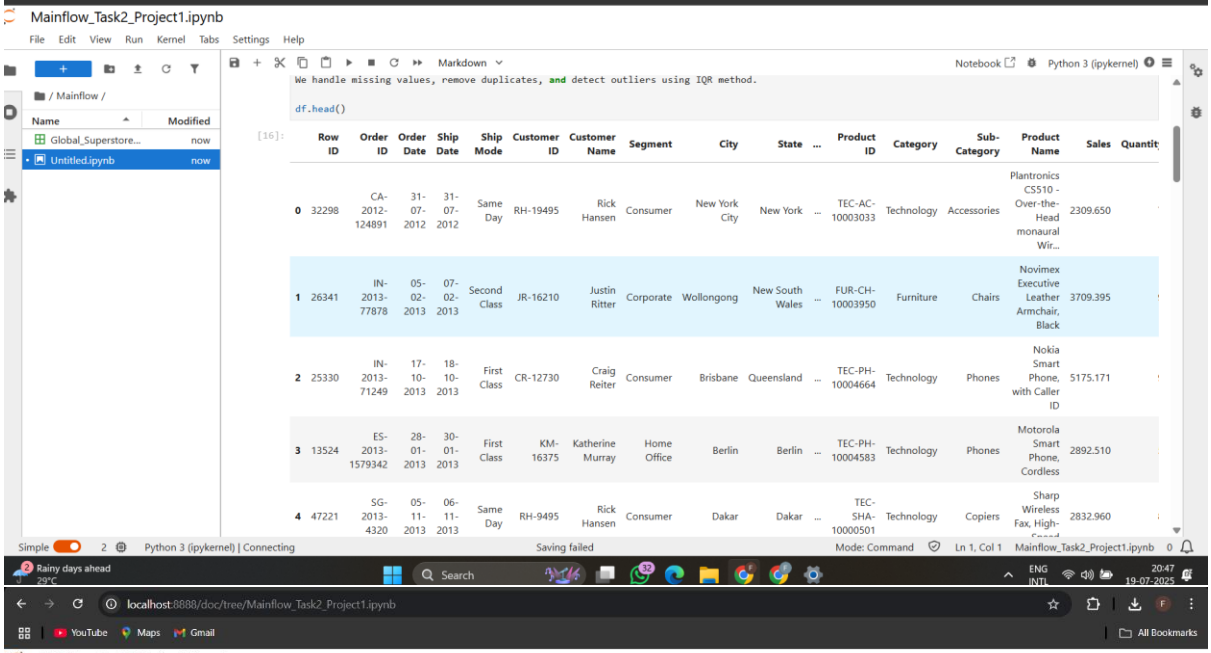
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Python 3 (ipykernel)
/ Mainflow /
Name
Modified
Global_Superstore...
now
Untitled.ipynb
now
We handle missing values, remove duplicates, and detect outliers using IQR method.
[16]:
df.head()
Row ID
Order ID
Order Date
Ship Date
Ship Mode
Customer ID
Customer Name
Segment
City
State
...
Product ID
Category
Sub-Category
Product Name
Sales
Quantity
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32298
CA-2012-124891
31-07-2012
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07-02-2013
Second Class
JR-16210
Justin Ritter
Corporate
Wollongong
New South Wales
...
FUR-CH-10003950
Furniture
Chairs
Novimex Executive Leather Armchair, Black
3709.395
2
25330
IN-2013-71249
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First Class
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Craig Reiter
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Technology
Phones
Nokia Smart Phone, with Caller ID
5175.171
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13524
ES-2013-1579342
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30-01-2013
First Class
KM-16375
Katherine Murray
Home Office
Berlin
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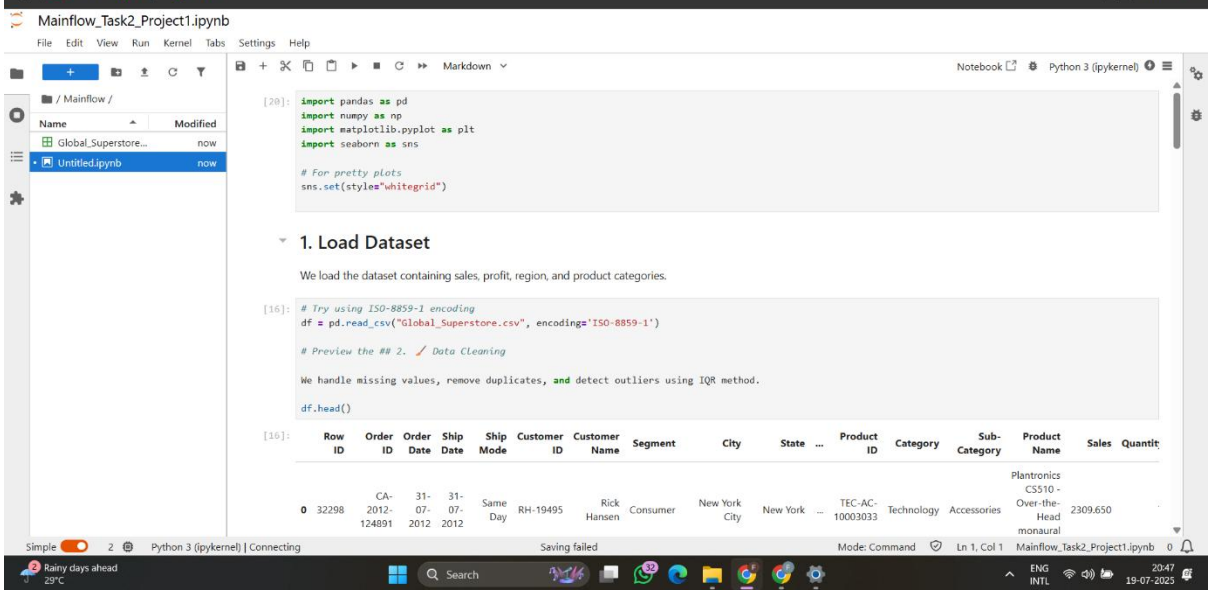
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Markdown
Notebook
Python 3 (ipykernel)
/ Mainflow /
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now
Untitled.ipynb
now
[20]:
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
import seaborn as sns
# For pretty plots
sns.set(style="whitegrid")
1. Load Dataset
We load the dataset containing sales, profit, region, and product categories.
[16]:
# Try using ISO-8859-1 encoding
df = pd.read_csv("Global_Superstore.csv", encoding='ISO-8859-1')
# Preview the ## 2. 🧹 Data Cleaning
We handle missing values, remove duplicates, and detect outliers using IQR method.
df.head()
[16]:
Row ID
Order ID
Order Date
Ship Date
Ship Mode
Customer ID
Customer Name
Segment
City
State
...
Product ID
Category
Sub-Category
Product Name
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