Experiment 1: Data Loading, Cleaning, and Preprocessing

Aim:

The goal of this experiment is to understand how to load a dataset, clean it, and perform basic preprocessing steps to prepare it for analysis

1. Importing Required Libraries

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt

Explanation:
We import `numpy` for numerical computations, `pandas` for handling data in tabular format, and `matplotlib.pyplot` for data visualization.

2. Loading the Dataset

```
df = pd.read_csv("D:/tsa_107/data/Microsoft_Stock.csv")
```

Explanation:
We use `pd.read_csv()` to load a CSV file containing Microsoft stock data.

3. Understanding the Data

```
print(df.describe())
```

Explanation:
`df.describe()` provides a statistical summary of the dataset, including mean, median, min, and max values for each numerical column.

4. Displaying the First Few Rows

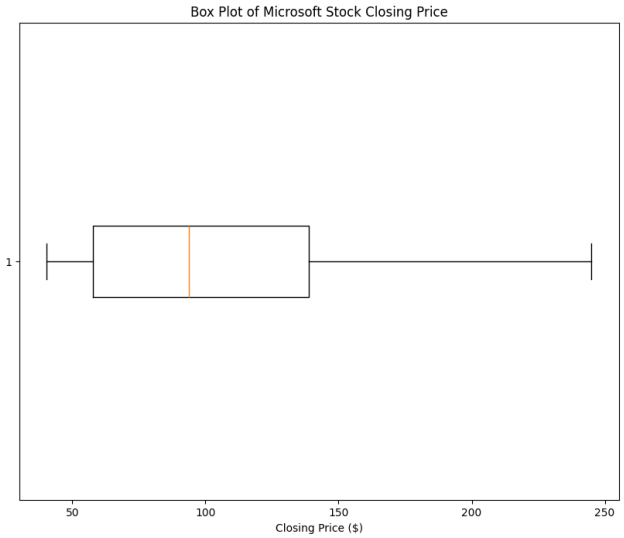
```
df.head()
```

Explanation:
`df.head()` shows the first five rows of the dataset, giving us an overview of the available columns and their values.

5. Visualizing Outliers with Box Plot

```
plt.figure(figsize=(10, 8))
plt.boxplot(df['Close'], vert=False)
plt.title('Box Plot of Microsoft Stock Closing Price')
plt.xlabel('Closing Price ($)')
plt.show()
```

Explanation:
A box plot helps visualize the distribution of closing stock prices, detecting outliers and understanding the spread of the data.



7. Checking for Missing Values

```
print(df.isnull().sum())
```

Explanation:
`df.isnull().sum()` displays the number of missing values in each column, helping us identify if any data cleaning is required.

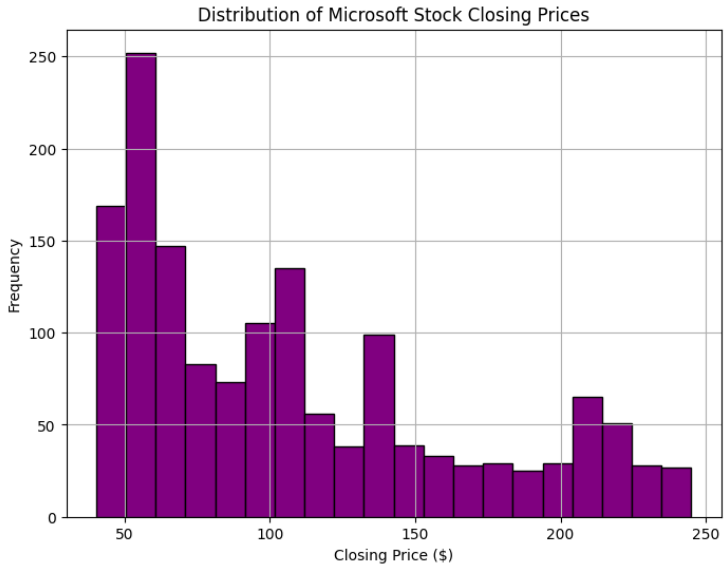
8. Visualizing the Distribution of Closing Prices with Histogram

```
plt.figure(figsize=(8, 6))
plt.hist(df['Close'], bins=20, color='purple', edgecolor='black')
plt.title('Distribution of Microsoft Stock Closing Prices')
plt.xlabel('Closing Price ($)')
```

```
plt.ylabel('Frequency')
plt.grid(True)
plt.show()
```

Explanation:

A histogram shows the frequency distribution of closing prices, helping us understand data



Result:

Thus the experiment to practice data loading,cleaning and pre-processing has been completed successfully