EX:No.2 DATE: 08/02/25	**Implement Programs on DATA VISUALIZATIONS**

AIM:

To clean, preprocess, and visualize stock data, focusing on trend analysis and handling missing values.

CODE AND DESCRIPTION:

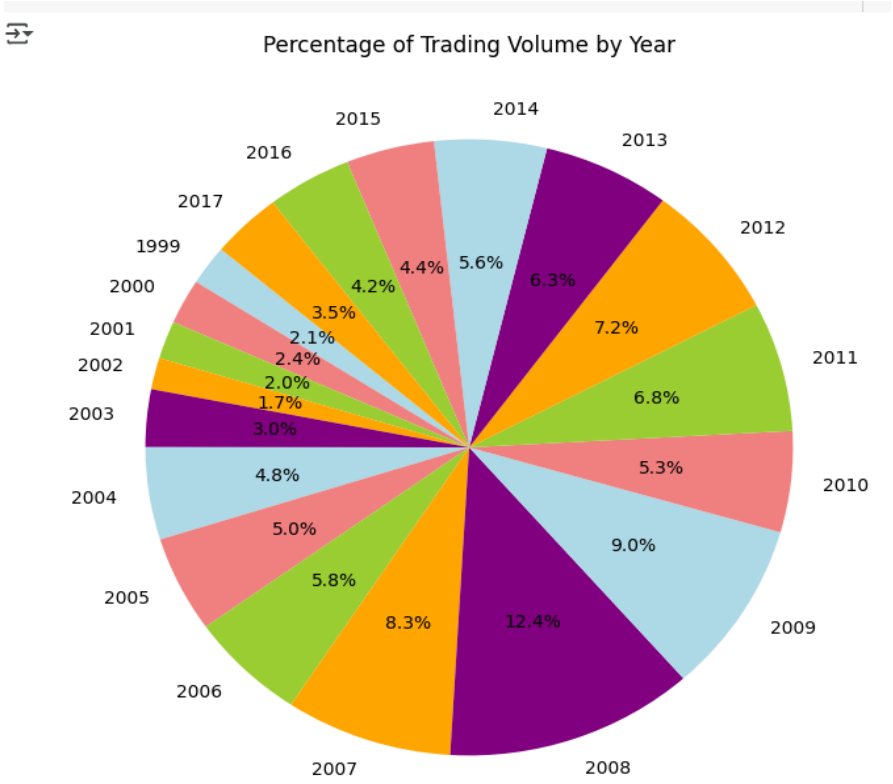
```
import pandas as pd
import matplotlib.pyplot as plt
# Load dataset
df = pd.read_csv("/content/INFY.csv")
# Convert Date column to datetime
df['Date'] = pd.to_datetime(df['Date'])

# Set Date as index
df.set_index('Date', inplace=True)
# Plot - Closing Price Trend
plt.figure(figsize=(12,6))
plt.plot(df.index, df['Close'], label="Closing Price",
color='blue')
plt.title("Closing Price Trend Over Time")
plt.xlabel("Date")
plt.ylabel("Closing Price (USD)")
plt.legend()
plt.grid(True)
plt.xticks(rotation=45)
plt.show()
```

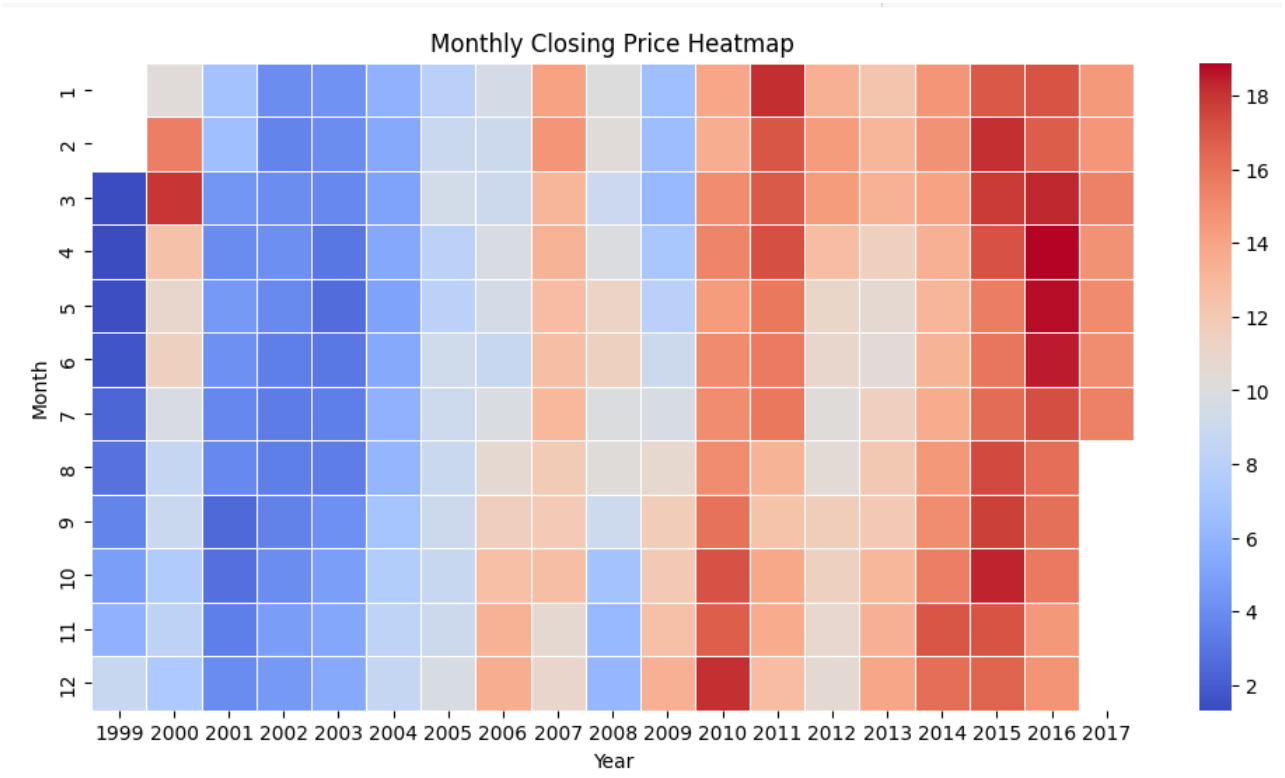
```
# Extract Year
df['Year'] = df.index.year

# Aggregate Volume by Year
volume_by_year =
df.groupby('Year')['Volume'].sum()

# Plot Pie Chart
plt.figure(figsize=(8, 8))
plt.pie(volume_by_year,
labels=volume_by_year.index, autopct='%1.1f%%',
startangle=140, colors=['lightblue', 'lightcoral',
'yellowgreen', 'orange', 'purple'])
plt.title("Percentage of Trading Volume by Year")
plt.show()

import seaborn as sns

# Extract Year and Month
df['Year'] = df.index.year
df['Month'] = df.index.month

# Create pivot table for heatmap
heatmap_data = df.pivot_table(values='Close',
index='Month', columns='Year')

# Heatmap visualization
plt.figure(figsize=(12,6))
sns.heatmap(heatmap_data, cmap='coolwarm',
annot=False, linewidths=0.5)
plt.title("Monthly Closing Price Heatmap")
```

```
plt.xlabel("Year")
plt.ylabel("Month")
plt.show()

plt.figure(figsize=(8,5))
sns.boxplot(y=df['Close'])

import squarify
import matplotlib.pyplot as plt

# Treemap visualization of Trading Volume by Year
plt.figure(figsize=(10,6))
squarify.plot(sizes=volume_by_year.values,
label=volume_by_year.index, alpha=0.7,
color=['lightblue', 'lightcoral', 'yellowgreen',
'orange', 'purple'])
plt.title("Treemap of Trading Volume by Year")
plt.axis('off')  # Hide axis
plt.show()

plt.title("Closing Price Distribution")
plt.ylabel("Closing Price (USD)")
plt.grid(True)
plt.show()
```

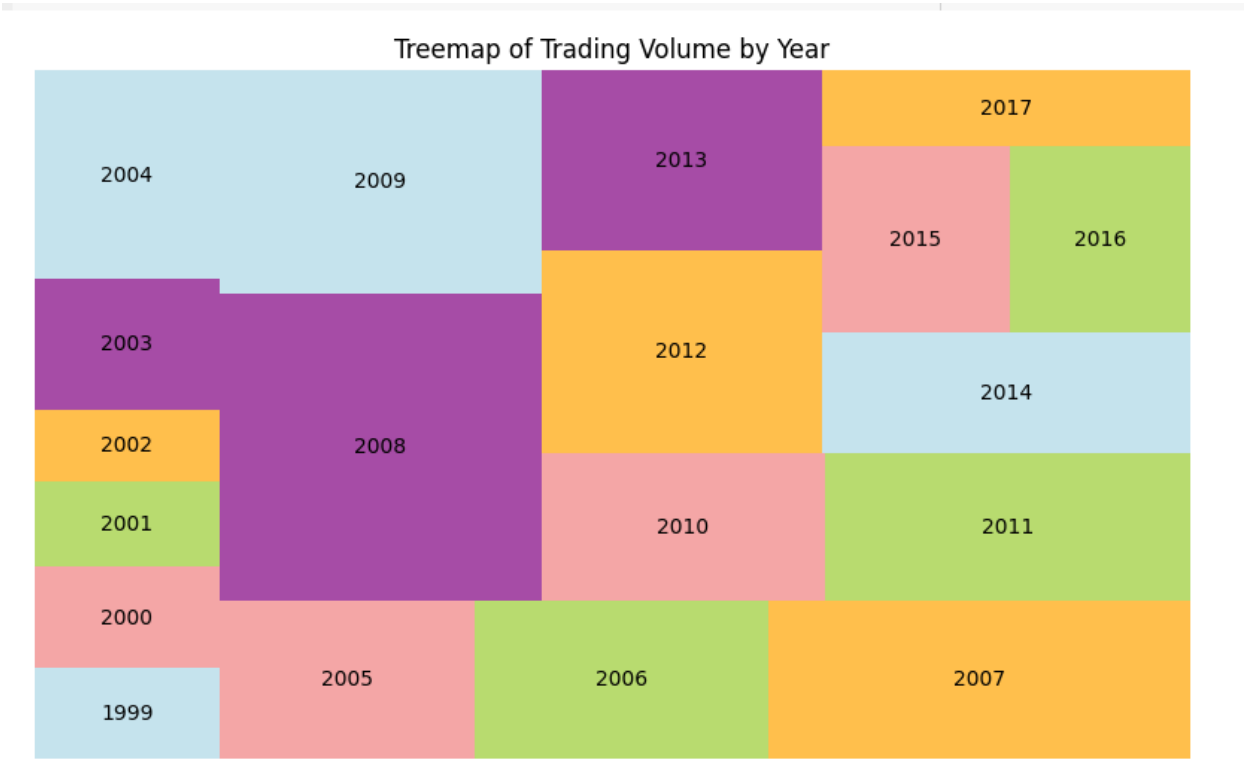
OUTPUT:


Closing Price Trend Over Time
Closing Price
Closing Price (USD)
Date
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5
2000
2002
2004
2006
2008
2010
2012
2014
2016
2018


Percentage of Trading Volume by Year
2014
2013
2012
2011
2010
2009
2008
2007
2006
2005
2004
2003
2002
2001
2000
1999
2017
2016
2015
5.6%
6.3%
7.2%
6.8%
5.3%
9.0%
12.4%
8.3%
5.8%
5.0%
4.8%
3.0%
1.7%
2.0%
2.4%
2.1%
3.5%
4.2%
4.4%


Monthly Closing Price Heatmap
Month
1
2
3
4
5
6
7
8
9
10
11
12
1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012 2013 2014 2015 2016 2017
Year
18
16
14
12
10
8
6
4
2


Closing Price Distribution
Closing Price (USD)
22.5
20.0
17.5
15.0
12.5
10.0
7.5
5.0
2.5



RESULT:

Thus, the program has been completed and verified successfully.