**EX:No.1 221501018**

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**program to implement time series data for import library, load data, Preprocessing and visualising**

# Import necessary libraries

import pandas as pd

import matplotlib.pyplot as plt

import seaborn as sns

# Load the dataset

file\_path = 'aapl.csv' # Replace with the path to your dataset

data = pd.read\_csv(file\_path)

# Display the first few rows of the dataset

print("First few rows of the dataset:")

print(data.head())

# Preprocessing

# Ensure the 'Date' column is in datetime format and sort by date

if 'Date' in data.columns:

data['Date'] = pd.to\_datetime(data['Date'])

data = data.sort\_values(by='Date')

else:

raise ValueError("The dataset must have a 'Date' column.")

# Set 'Date' as the index

data.set\_index('Date', inplace=True)

# Check for missing values

print("\nChecking for missing values:")

print(data.isnull().sum())

# Handle missing values if any (e.g., forward-fill method)

data.fillna(method='ffill', inplace=True)

# Visualize the time series data

plt.figure(figsize=(12, 6))

sns.set\_style('whitegrid')

# Assuming 'Close' is the column with stock prices

if 'Close' in data.columns:

plt.plot(data.index, data['Close'], label='Close Price', color='blue')

plt.title('AAPL Stock Price Over Time')

plt.xlabel('Date')

plt.ylabel('Stock Price')

plt.legend()

plt.show()

else:

raise ValueError("The dataset must have a 'Close' column for stock prices.")

# Additional visualization: Moving Average

data['MA\_50'] = data['Close'].rolling(window=50).mean() # 50-day Moving Average

plt.figure(figsize=(12, 6))

plt.plot(data.index, data['Close'], label='Close Price', color='blue', alpha=0.5)

plt.plot(data.index, data['MA\_50'], label='50-Day MA', color='orange', linewidth=2)

plt.title('AAPL Stock Price with 50-Day Moving Average')

plt.xlabel('Date')

plt.ylabel('Stock Price')

plt.legend()

plt.show()

**OUTPUT:**

