**EX:No.1 221501023**

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

#Importing libraries

import pandas as pd

# Load the stock data

file\_path = r'AAPL\_short\_volume.csv'

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

close\_prices\_AAPL = data['Close']

# Reverse the order of the data

close\_prices\_AAPL\_reverse = close\_prices\_AAPL.iloc[::-1]

# Reset index to maintain the correct time series order in the plot

close\_prices\_AAPL\_reverse.reset\_index(drop=True, inplace=True)

# 1. Handling Missing Values:

# Check for missing values in each column

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

# Drop rows with missing values (if not too many)

data.dropna(inplace=True)

# Fill missing values in 'Close' with the mean - Moved before outlier handling

data['Close'].fillna(data['Close'].mean(), inplace=True) # Fill NaNs in 'Close' column

# 2. Handling Outliers:

# (a) Visualization: Create box plots or scatter plots to visually identify outliers.

# (b) Using IQR (Interquartile Range):

# Calculate IQR for relevant numerical columns, e.g., 'Close'

Q1 = data['Close'].quantile(0.25)

Q3 = data['Close'].quantile(0.75)

IQR = Q3 - Q1

lower\_bound = Q1 - 1.5 \* IQR

upper\_bound = Q3 + 1.5 \* IQR

# Filter data to remove outliers

data = data[(data['Close'] >= lower\_bound) & (data['Close'] <= upper\_bound)]

# Data preprocessing

import numpy as np

data = close\_prices\_AAPL\_reverse.values.reshape(-1, 1)  # Reshape the data

data\_normalized = data / np.max(data)  # Normalize the data

# Split the data into training and testing sets

train\_size = int(len(data\_normalized) \* 0.8)

train\_data = data\_normalized[:train\_size]

test\_data = data\_normalized[train\_size:]

# Plot the line chart

import matplotlib.pyplot as plt

plt.figure(figsize=(10, 6))

plt.plot(close\_prices\_AAPL\_reverse)

plt.xlabel('Time')

plt.ylabel('Close Prices')

plt.title('AAPL Stock Close Prices')

plt.grid(True)

plt.show()