**EX:No.1** **221501017**

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## PROGRAM TO IMPLEMENT TIME SERIES DATA FOR IMPORT LIBRARY, LOAD DATA, PREPROCESSING AND VISUALISING

**AIM:**

To write Program to implement time series data for import library, load data, Preprocessing and visualising.

**PROCESS:**

**#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()
```

**OUTPUT:**


AAPL Stock Close Prices
Close Prices
190
180
170
160
150
140
130
350
400
450
500
550
600
Time

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**RESULT:**

The program To write Program to implement time series data for import library, load data, Preprocessing and visualising is created and executed successfully.