# 4. To check stationary of a time series data

**AIM:**

Implement programs to check stationary of a time series data.

**PROCEDURE & CODE:**

*1.Import all necessary lib.*

import pandas as pd

import matplotlib.pyplot as plt

from statsmodels.tsa.stattools import adfuller, kpss

*2.Load the dataset*

file\_path = r"C:\Users\Lenovo\check stationary of a time series data\dataset.csv"

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

*3. Convert 'Date' column to datetime format and set it as index*

df["Date"] = pd.to\_datetime(df["Date"])

df.set\_index("Date", inplace=True)

*4.Extract the 'Close' price for stationarity analysis*

close\_prices = df["Close"]

*5. Perform Augmented Dickey-Fuller (ADF) test*

adf\_test = adfuller(close\_prices)

print("ADF Test Results:")

print(f"ADF Statistic: {adf\_test[0]:.6f}")

print(f"p-value: {adf\_test[1]:.6f}")

print("Critical Values:")

for key, value in adf\_test[4].items():

print(f" {key}: {value:.6f}")

if adf\_test[1] < 0.05:

print("Conclusion: The series is stationary (reject null hypothesis).")

else:

print("Conclusion: The series is not stationary (fail to reject null hypothesis).")

*5. Perform Kwiatkowski-Phillips-Schmidt-Shin (KPSS) test*

kpss\_test = kpss(close\_prices, regression="c", nlags="auto")

print("\nKPSS Test Results:")

print(f"KPSS Statistic: {kpss\_test[0]:.6f}")

print(f"p-value: {kpss\_test[1]:.6f}")

print("Critical Values:")

for key, value in kpss\_test[3].items():

print(f" {key}: {value:.6f}")

if kpss\_test[1] > 0.05:

print("Conclusion: The series is stationary (fail to reject null hypothesis).")

else:

print("Conclusion: The series is not stationary (reject null hypothesis).")