

Date:20-02-25

EXPERIMENT - 4

CHECKING STATIONARY OF TIME SERIES DATASET

AIM :

To write a python program for checking the stationary of the given time series dataset.

PROGRAM :

```
import pandas as pd
import numpy as np
import matplotlib.pyplot as plt
from statsmodels.tsa.stattools import adfuller

# Load the dataset
file_path = "/content/MLTempDataset.csv"
df = pd.read_csv(file_path)

# Assuming the time series column is the first column (modify if
needed)
time_series_column = df.columns[1] # Change index if needed
ts = df[time_series_column].dropna()

# Function to perform Augmented Dickey-Fuller test
def check_stationarity(timeseries):
    result = adfuller(timeseries)
    print("Augmented Dickey-Fuller Test:")
    print(f"ADF Statistic: {result[0]}")
    print(f"p-value: {result[1]}")
    print("Critical Values:")
    for key, value in result[4].items():
        print(f"    {key}: {value}")

    if result[1] <= 0.05:
        print("The time series is stationary.")
    else:
        print("The time series is not stationary.")

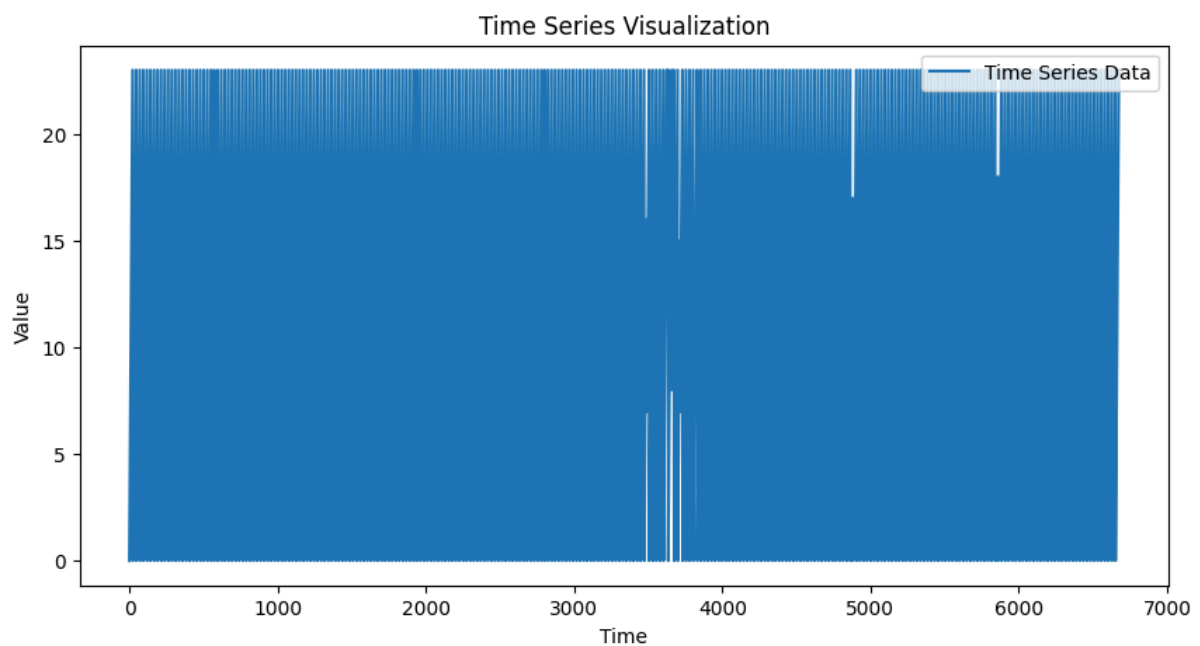
# Function to visualize time series
def plot_time_series(timeseries):
    plt.figure(figsize=(10, 5))
    plt.plot(timeseries, label="Time Series Data")
    plt.title("Time Series Visualization")
    plt.xlabel("Time")
```

```
plt.ylabel("Value")
plt.legend()
plt.show()

# Run stationarity check
check_stationarity(ts)

# Plot the time series
plot_time_series(ts)
```

OUTPUT:



```
Augmented Dickey-Fuller Test:
ADF Statistic: -15.560769702149011
p-value: 2.0439054572364356e-28
Critical Values:
  1%: -3.4313352153333847
  5%: -2.8619753823130654
 10%: -2.567001750458158
The time series is stationary.
```

RESULT :

Thus the program has been executed successfully.