Experiment-4

IMPLEMENT PROGRAM TO CHECK STATIONARY OF TIME SERIES DATA

AIM:
TO WRITE A TO IMPLEMENT PROGRAM TO CHECK STATIONARY OF TIME SERIES DATA

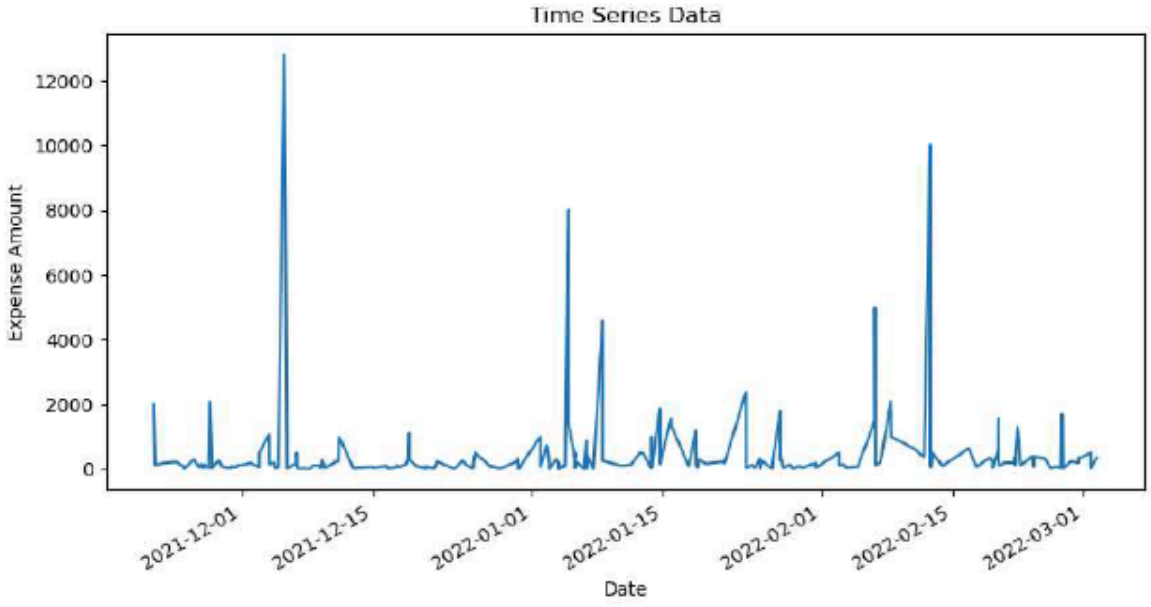
PROCEDURE:
1) Import necessary libraries.
2)Load the necessary libraries
3)convert date column datatype to datetime
4)Aggregate the expense by date
5)Plot the time series data.
6)perform Augumented DickyFuller test
7) Perform interpolation test.

CODE:

```
# Importing libraries
import pandas as pd
import numpy as np
import seaborn as sns
import matplotlib.pyplot as plt


# Experiment 4: Time Series Analysis
# Plot the time series data
df_grouped.set_index('Date')['Amount'].plot(figsize=(10, 5), title="Time Series Data")
plt.xlabel("Date")
plt.ylabel("Expense Amount")
plt.show()

# Perform Augmented Dickey-Fuller test to check stationarity
from statsmodels.tsa.stattools import adfuller
```

```
adf_test = adfuller(df_grouped['Amount'])
print("ADF Statistic:", adf_test[0])
print("p-value:", adf_test[1])
print("Critical Values:", adf_test[4])

# Check if the time series data is stationary
if adf_test[1] < 0.05:
    print("The time series data is stationary.")
else:
    print("The time series data is non-stationary. Consider differencing or transformation.")
```

OUTPUT:




```
ADF Statistic: -14.213509911021116
p-value: 1.7053917688446326-26
Critical Values: {'1%': -3.458010773719797, '5%': -2.8737103617125186, '10%': -2.5732559963936286}
```

```
The time series data is stationary.
```

RESULT:
The program to check stationary of a time series data is implemented successfully