**5.Program to check stationarity of a time series data**

**Aim:**

To implement a program in Python to check the stationarity of a time series dataset using the Augmented Dickey-Fuller (ADF) Test.

**Procedure:**

1.Import necessary libraries such as pandas and statsmodels.tsa.stattools.

2.Load the dataset from a CSV file.

3.Convert the 'year' column to datetime format for proper time-series handling.

4.Set 'year' as the index to structure the data for analysis.

5.Extract the relevant numerical column (e.g., "rank") for stationarity testing.

6.Perform the ADF test on the selected time series.

7.Analyze the test results based on the p-value:

* If p < 0.05, the series is stationary.
* If p ≥ 0.05, the series is not stationary.\

**Code:**

import pandas as pd

from statsmodels.tsa.stattools import adfuller

df = pd.read\_csv("your\_dataset.csv")

df["year"] = pd.to\_datetime(df["year"], format="%Y")

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

ts = df["rank"].dropna()

adf\_result = adfuller(ts)

print(f" ADF Test p-value: {adf\_result[1]:.4f}")

if adf\_result[1] < 0.05:

print("The series is stationary.")

else:

print(" The series is NOT stationary.")\

**Output**:



**Result:**

The program to check stationarity of time series data(Google trends dataset) is successfully implemented and verified