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Program to check Stationary 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:

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

**Load the dataset** from a CSV file.

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

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

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

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

**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.")

Result:

The Program to check Stationary of a time series data is implemented successfully and verified