Testing for Stationarity

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Check Stationary

There are two main ways to assess time series data is **stationary :**

1.Visual Inspection

2.Statistical Hypothesis Tests

Visual Inspection

Though not definitive, **plotting the time series** can give quick insight into non-stationarity.

a. Time Series Plot

- A clear **trend or changing variance** indicates non-stationarity.
- Stationary series will fluctuate around a constant **mean level** with constant **variance.**

b. Rolling Statistics (Moving Average and Moving Std Dev)

- Calculate **rolling mean** and **rolling standard deviation** using a fixed window (e.g., 12 periods).
- **If they remain roughly constant,** it's a good sign of stationarity.

Statistical Tests for Stationarity

- **ADF Test (Augmented Dickey-Fuller)**
- KPSS Test (Kwiatkowski-Phillips-Schmidt-Shin)
- Phillips-Perron (PP) Test

ADF Test (Augmented Dickey-Fuller)

- **Purpose:**
  - Checks whether a time series is trend stationary (stationary around a deterministic trend).

- **Hypotheses:**
  - H_0 (Null): The series is stationary
  - H_1 (Alt): The series is non-stationary

- **Interpretation:**
  - If p-value < 0.05: Reject H_0 → The series is non-stationary
  - If p-value ≥ 0.05: Fail to reject H_0 → The series is stationary