Stationary

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What is Stationarity in Time Series?

Stationarity refers to a property of a time series where its **statistical properties do not change over time.**

These properties typically include:

- **Mean** (average value)
- **Variance** (spread or dispersion of data)

- In a **stationary time series**, the behavior of the data remains consistent regardless of when you observe it.

- This consistency is crucial for many time series forecasting models.

Why is Stationarity Important in Time Series Modeling?

Model Assumptions:

- Many popular models like **ARIMA (AutoRegressive Integrated Moving Average)** assume the data is stationary.

- These models rely on the assumption that relationships between observations are stable over time.

Why is Stationarity Important in Time Series Modeling?

Forecast Reliability:

- If a series is stationary**, future behavior is predictable** based on past data patterns.
- Non-stationary data can lead to **spurious results** or unreliable forecasts.

Why is Stationarity Important in Time Series Modeling?

Simplifies Modeling:

- Stationary time series are **easier to model and analyze** statistically.
- Their properties (mean, variance, correlation) can be estimated and assumed valid for the future.

Non-Stationary Data Can Be Made Stationary:

- Techniques like **differencing**, **log transformation**, or **removing trends/seasonality** can transform non-stationary data into a stationary one.