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Introduction to Time Series Analysis

Unlocking insights through patterns in time-dependent data.

DEFINITION

> Time series analysis is a method used to analyze data points collected or recorded at specific time intervals. It helps identify trends, seasonal patterns, and forecasting future values.

KEY CONCEPTS

Trend

A trend is the long-term movement or direction in data over time, indicating growth or decline.

Seasonality

Seasonality refers to periodic fluctuations in data that occur at regular intervals, such as daily, monthly, or yearly.

Stationarity

A stationary time series has constant mean and variance over time, making it easier to analyze.

Autocorrelation

Autocorrelation measures the relationship between a time series and a lagged version of itself, helping to identify patterns.

Forecasting

Forecasting involves predicting future values based on historical data and identified patterns.

EXAMPLES

- → Stock prices over the last year.
- → Monthly sales data for a retail store.
- → Daily temperature readings in a city.

MEMORY TIPS

- ★ Remember 'T-SAFE': Trend, Seasonality, Autocorrelation, Forecasting, and Error.
- ★ Think of 'Stationary' as 'Stable' for easier recall.
- ★ Use the acronym 'TSA' for Trend, Seasonality, and Autocorrelation.

COMMON MISTAKES

- ✗ Ignoring the need for data stationarity before analysis.
- ✗ Confusing correlation with causation in time series data.
- ✗ Neglecting to account for seasonality in forecasting.

QUICK RECAP

Time series analysis helps us understand data collected over time by identifying trends and patterns. Key concepts include trend, seasonality, and autocorrelation, which are crucial for effective forecasting.