KI Service Zentrum by Hasso-Plattner-Institut

HPI

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Time Series Forecasting

1.1 Introduction to Time Series

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Design IT.
Create Knowledge.

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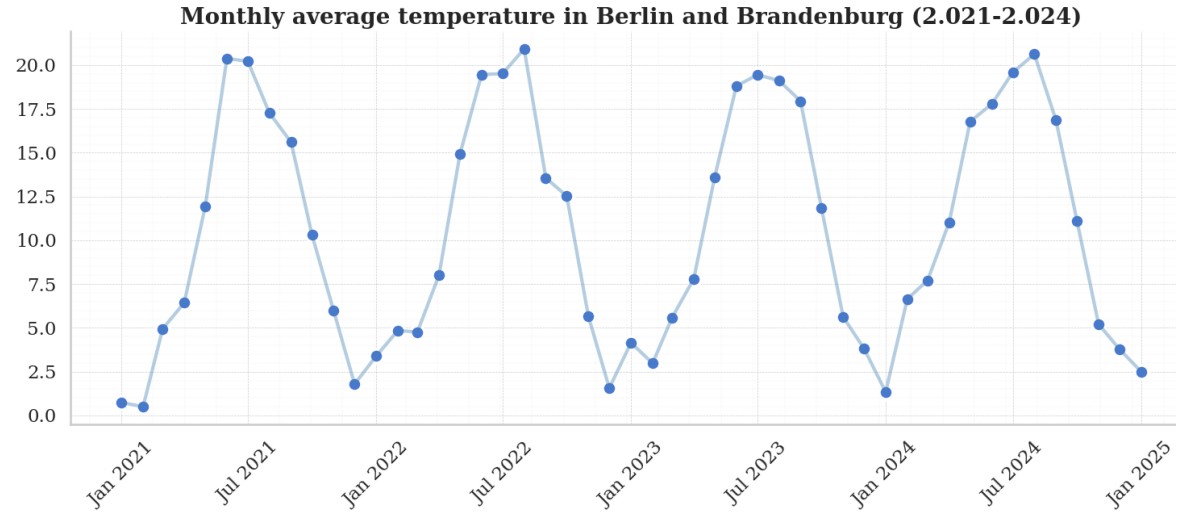
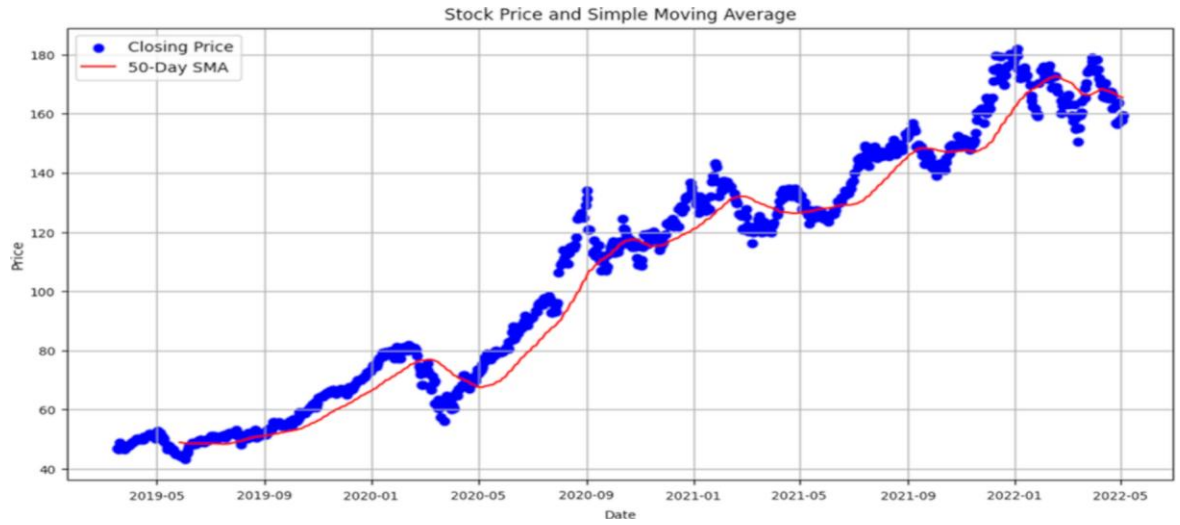
What we'll cover in this video

- What is Time Series data?
- Where and how it's used
- Real-world examples
- Why time series analysis is essential

What is Time Series Data?

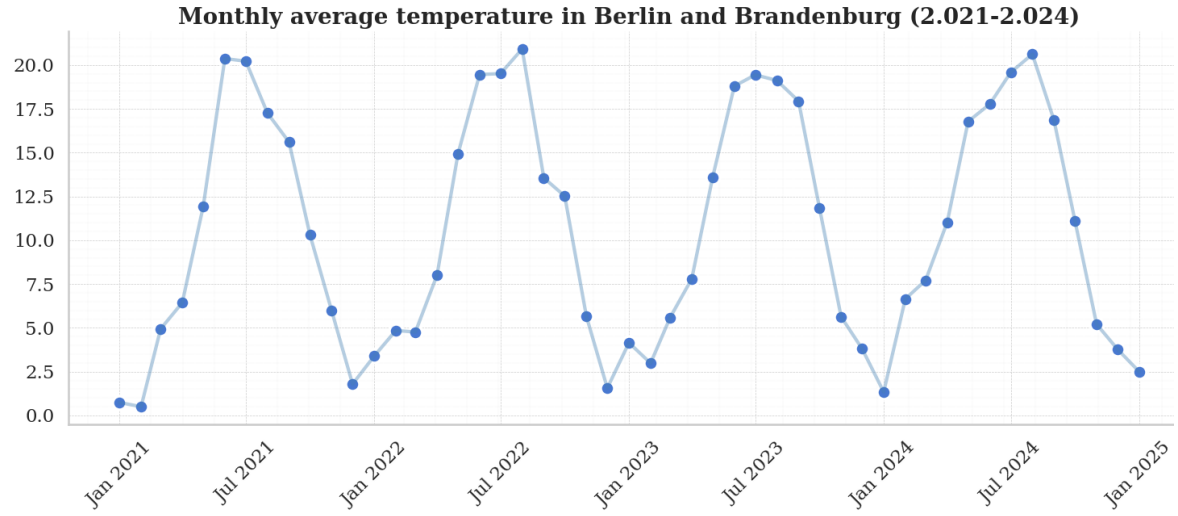
- A time series is a collection of observations recorded in chronological order.
- Each observation is associated with a specific timestamp (e.g., hourly, daily, monthly).

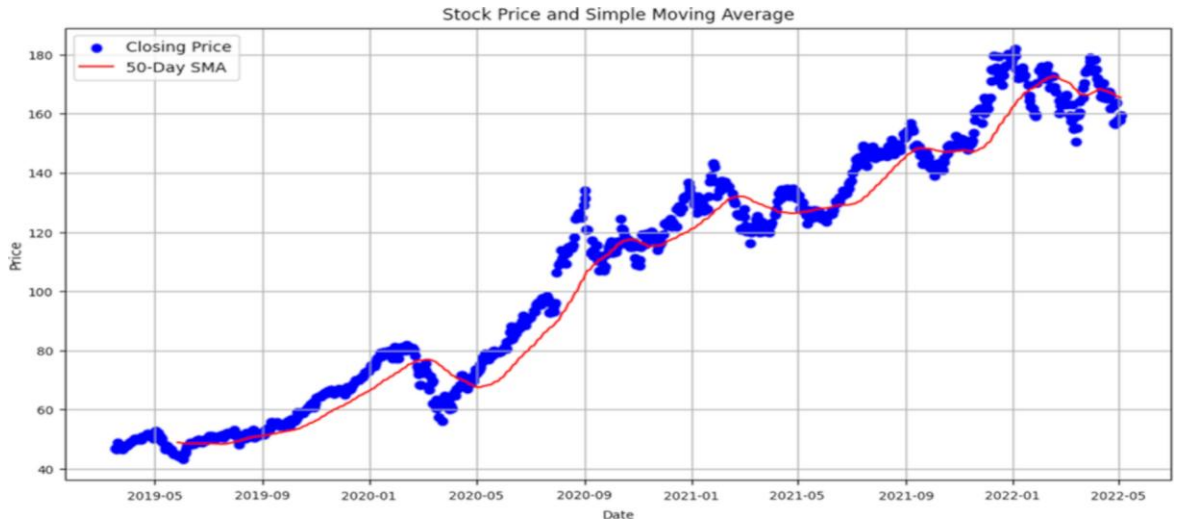




What makes Time Series special?

- Temporal Dependency
- Ordered Data
- Changing Patterns Over Time





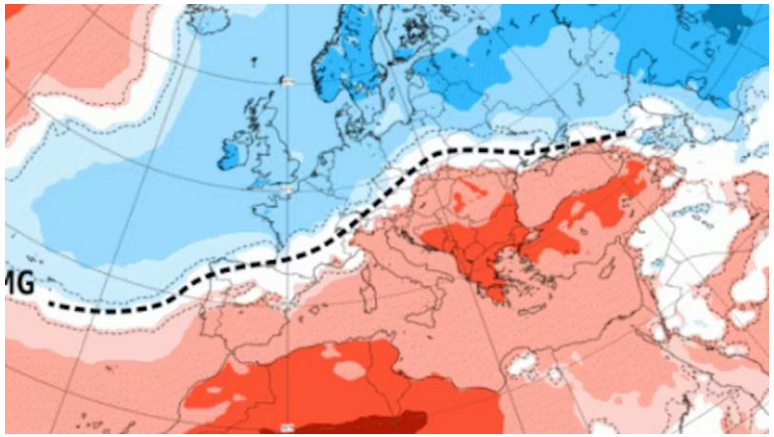
Where Is It Used

Stock Market Predictions

Forecasting prices, analyzing trends

Cryptocurrency Trends

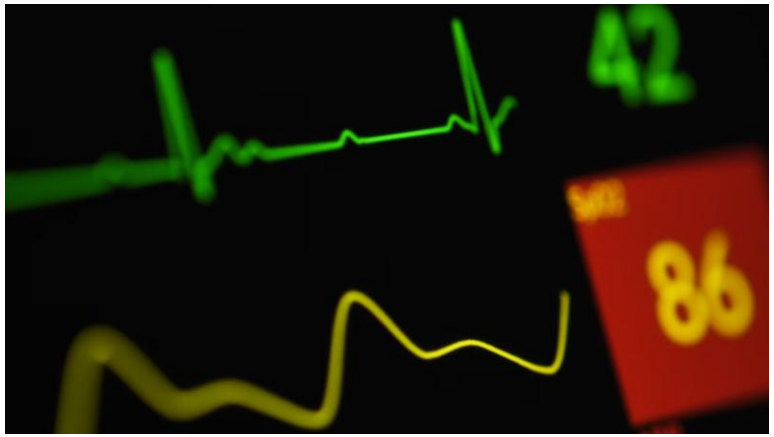
Tracking volatile markets in real time



Weather Forecasting

Predicting temperature, storms, and pressure shifts

Where Is It Used



Health Monitoring

Tracking vital signs like heart rate or oxygen levels over time

Energy Usage Patterns

Optimizing when and how we use electricity

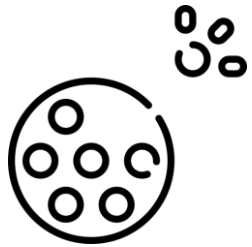
Predictive Maintenance

Preventing failures before they happen

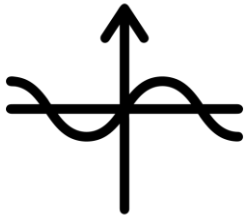
Why Time Series Data is Valuable?

Forecasting & Trend Prediction

Anomaly & Outlier Detection



Pattern Recognition & Classification



Causal Analysis & Decision Making

What we've learnt

- What time series data is

Data collected over time, where order and timing matter.

- What makes it unique

Temporal dependency and structure set it apart from other data types.

- Where it shows up

Used in finance, weather, healthcare, industry, and daily life.

- Why it matters

It helps us detect patterns, forecast, spot anomalies, and make better decisions.