

# Data Science Experience: Time Series

## Key Terms

**Time Series:** A dataset that tracks the same variable over time at regular intervals.

**Lag:** The delay between observations in a time series.

**Noise (Residuals):** Random variation in the data that isn't explained by trend or seasonality.

**Autocorrelative Function (ACF):** How much a time series is related to itself at time= $t$  and  $t \pm \text{lag}$

**Heteroscedasticity:** When the variability of a variable depends on another factor.

- Ex: Measuring cat sizes—variance is smaller if you only include kittens, larger if you include adults of different breeds. Age dependency

Data Skeptic: Time Series Mini Episodes

<https://dataskeptic.com/blog/episodes/2021/time-series-mini-episodes>

## Description

This episode of *The Data Skeptic* podcast joins three shorter segments covering time series analysis. Topics include a general overview of how data changes over time, basic terminology, techniques for isolating noise from data, and heteroscedasticity.

## Something I learned

This episode helped me to connect names to concepts I'd encountered before (e.g., autocorrelation and heteroscedasticity) and used simple real-world examples to illustrate these topics. I also found the coverage related to trends, noise, and variability a helpful reminder to think critically about assumptions in data analysis.

## Connection to INFO 511

Time series visualizations and detrending was previously covered in lectures 6 and 7 and we have plotted time series data in past assignments (e.g., Homework 1). For my final project, I am also using data that tracks changes in FBI crime reporting over time.