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# Fundamentals of Regression Analysis





Got Data?





Analysis





Uses

Do you check  
residuals?



# Various Approaches





# Linear Models

## Various Approaches

Simple, Multiple, General,  
Proportional, etc.

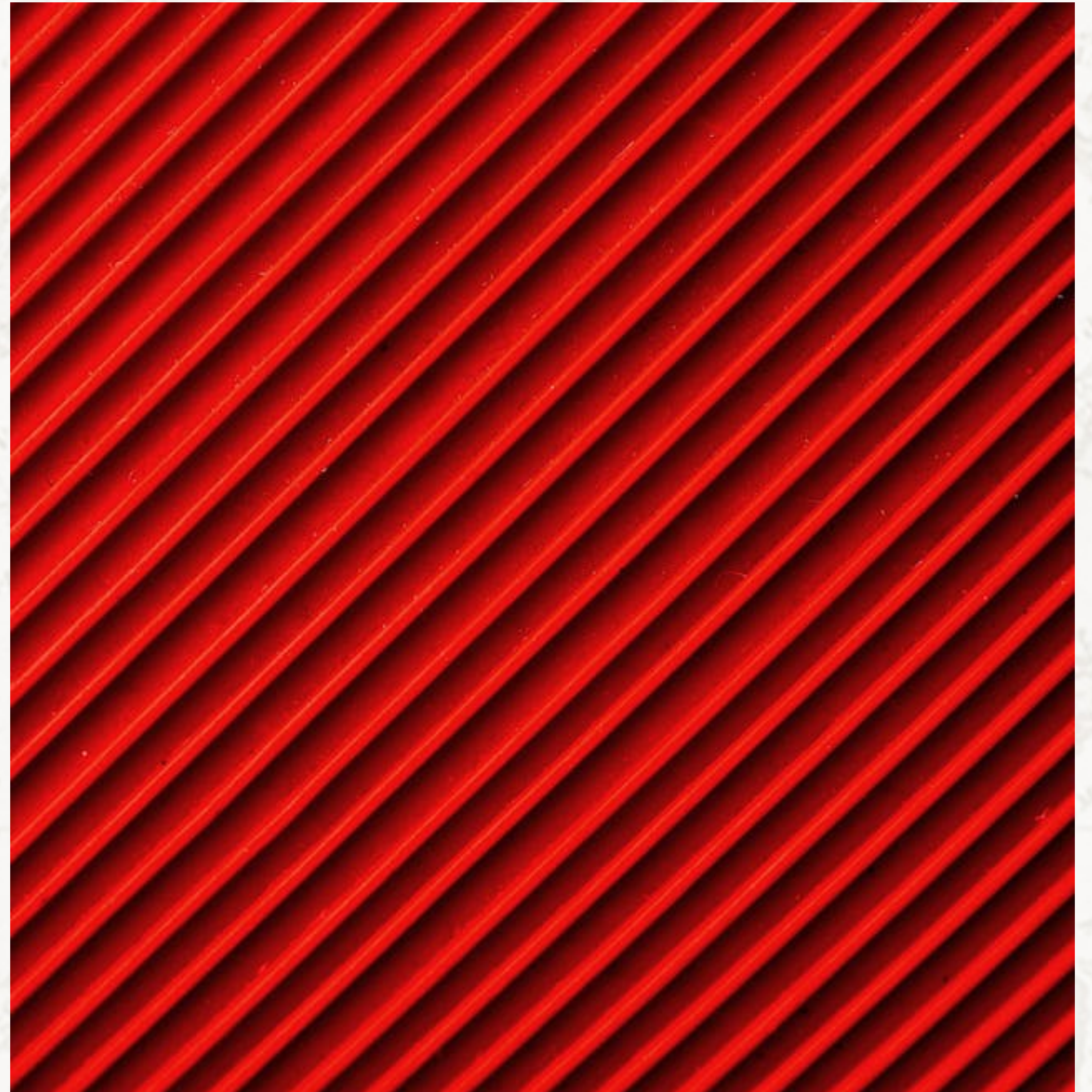




# Time Series Models

## Various Approaches

Moving Average, Exponential  
Smoothing, ARIMA





# Nonlinear Models

## Various Approaches

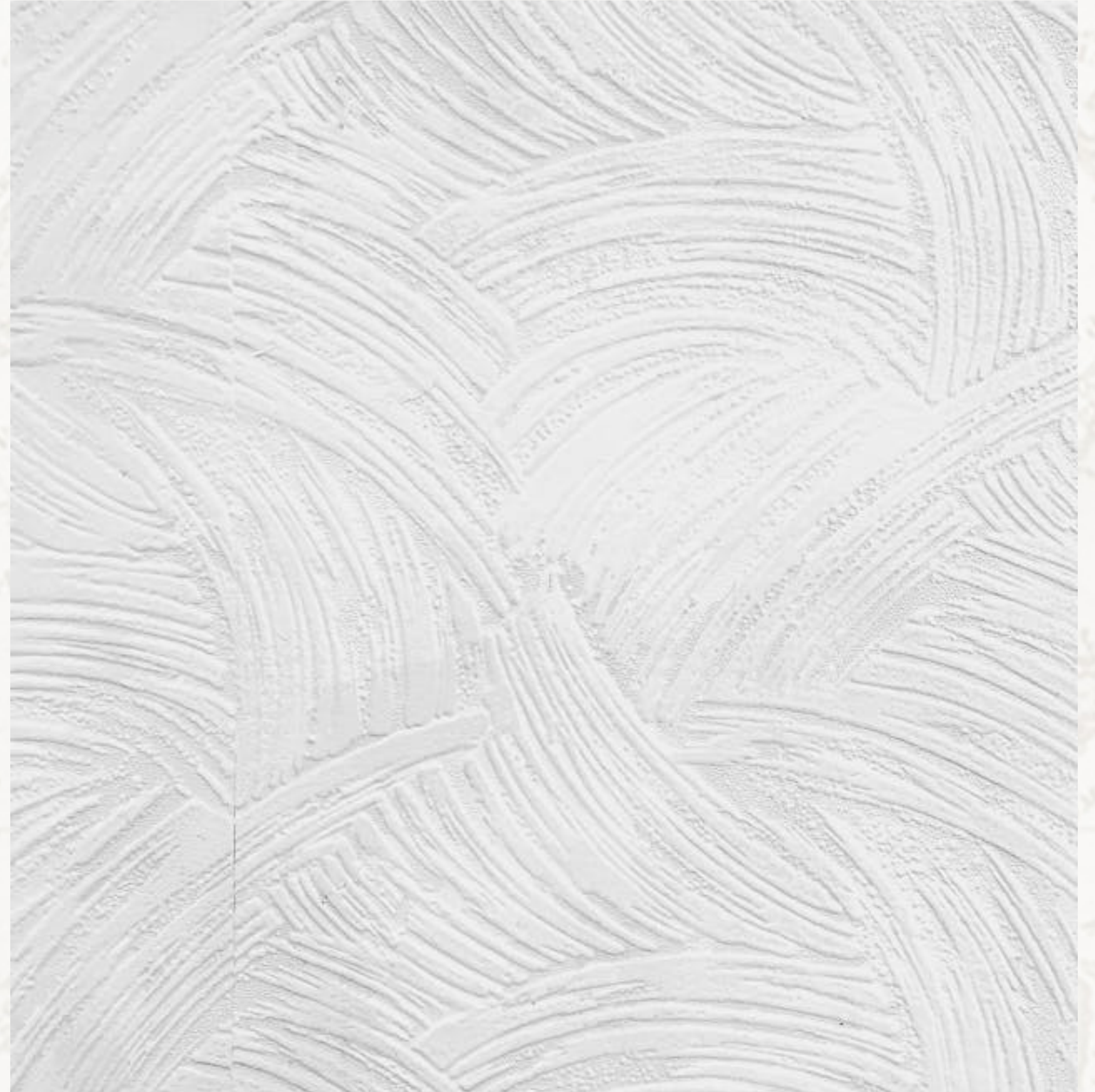
Sometimes things have a curve.

Parametric non-linear

Polynomial, Exponential, Power Law, etc

Non-parametric non-linear

machine learning algorithms



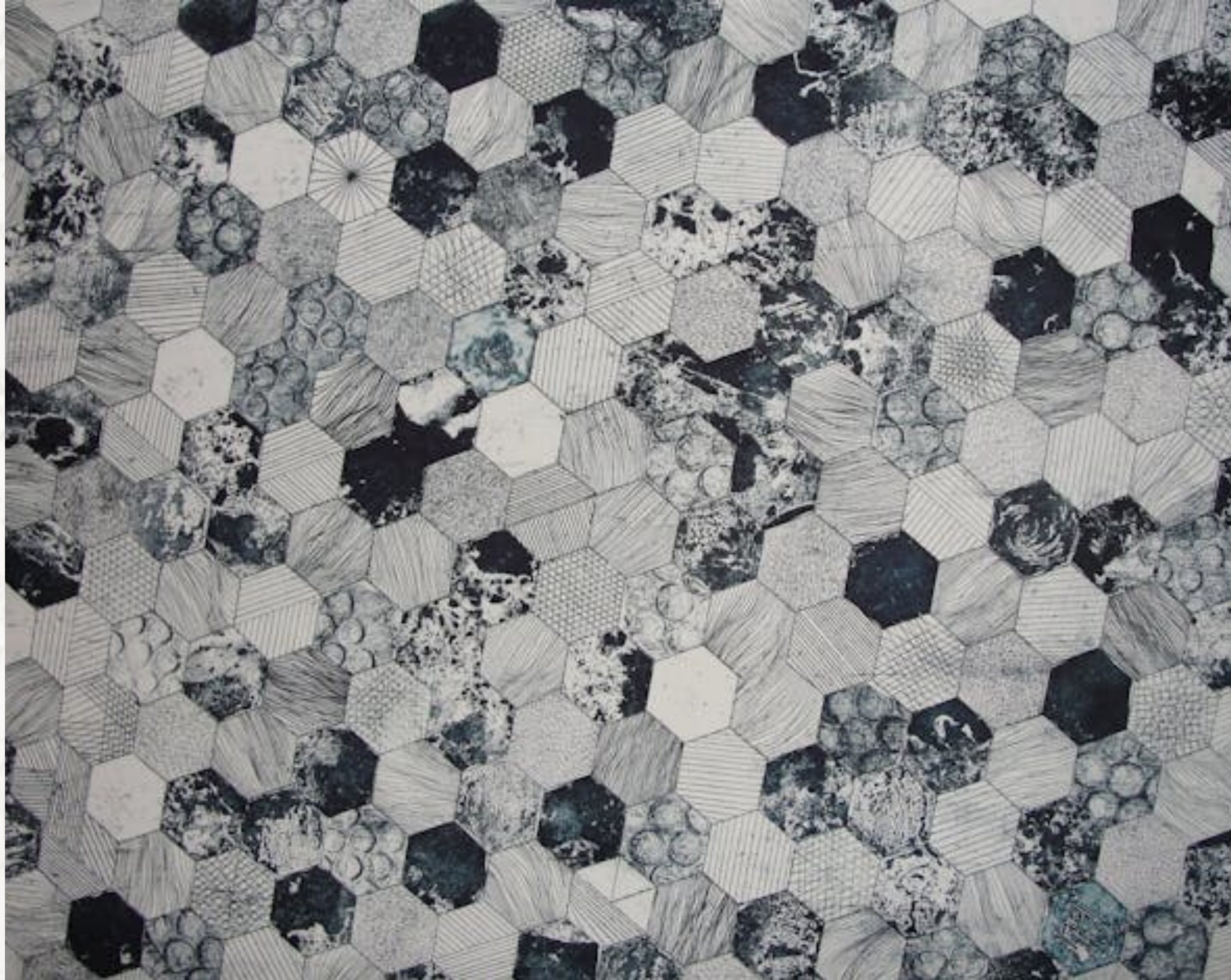


**Have you used**

**cluster analysis?**



# Some Problems





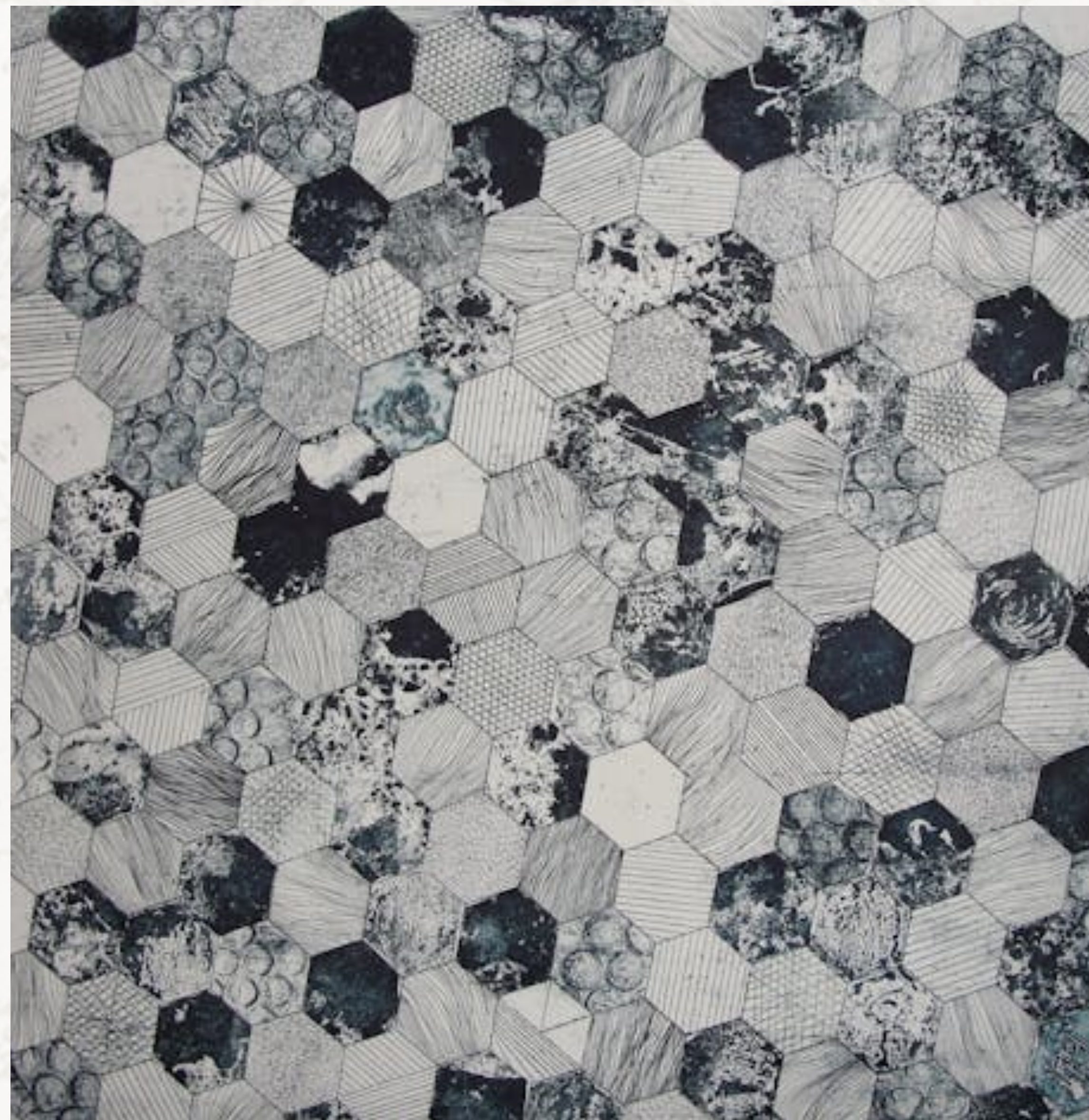
# Causation or Not

## Some Problems

Fitting a model does not imply causation.

Winner of the World Series and the stock market

Two girls named Mary story





# Missing variable

## Some Problems





# Overfitting

Some Problems



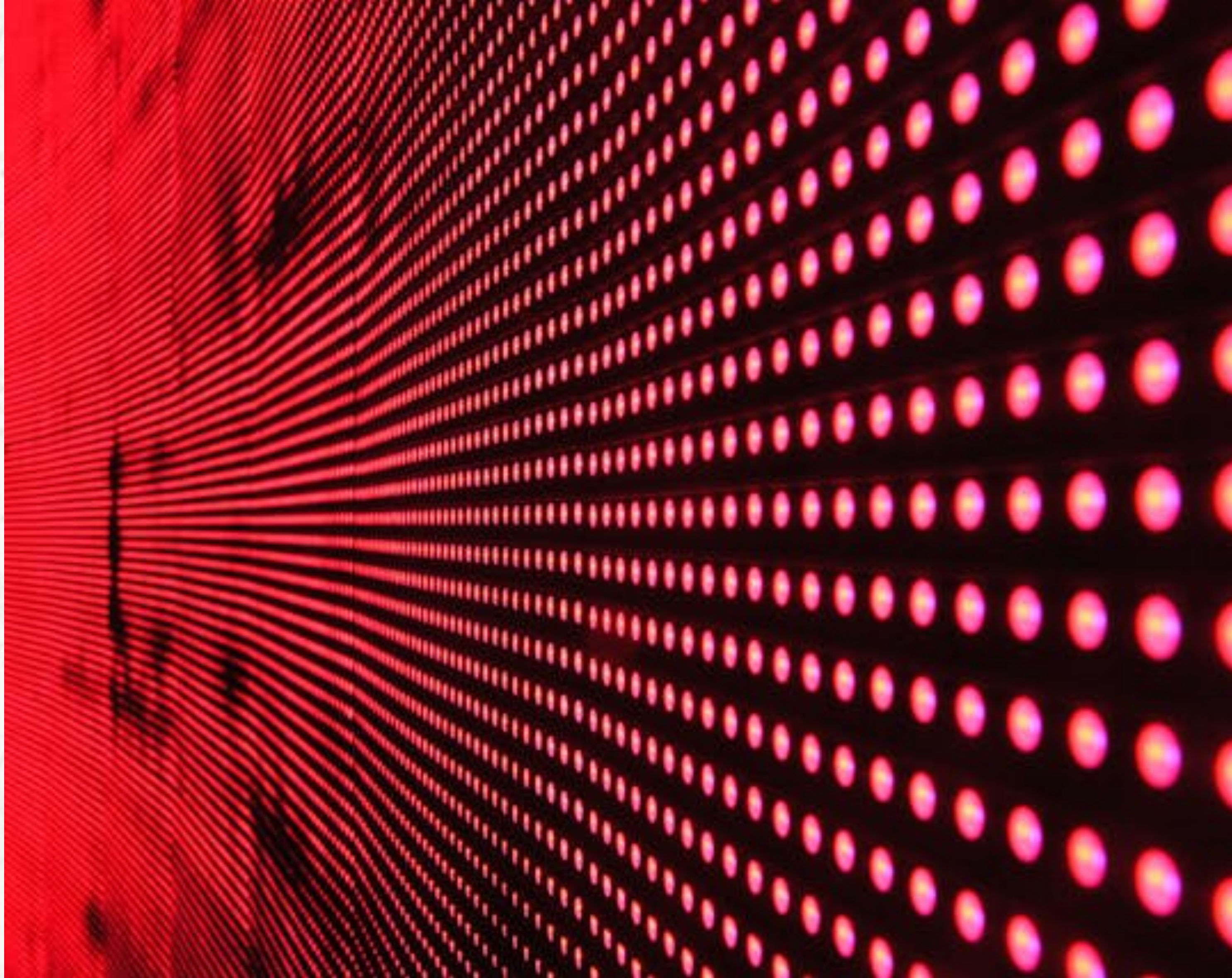


**What methods**

**do you use?**



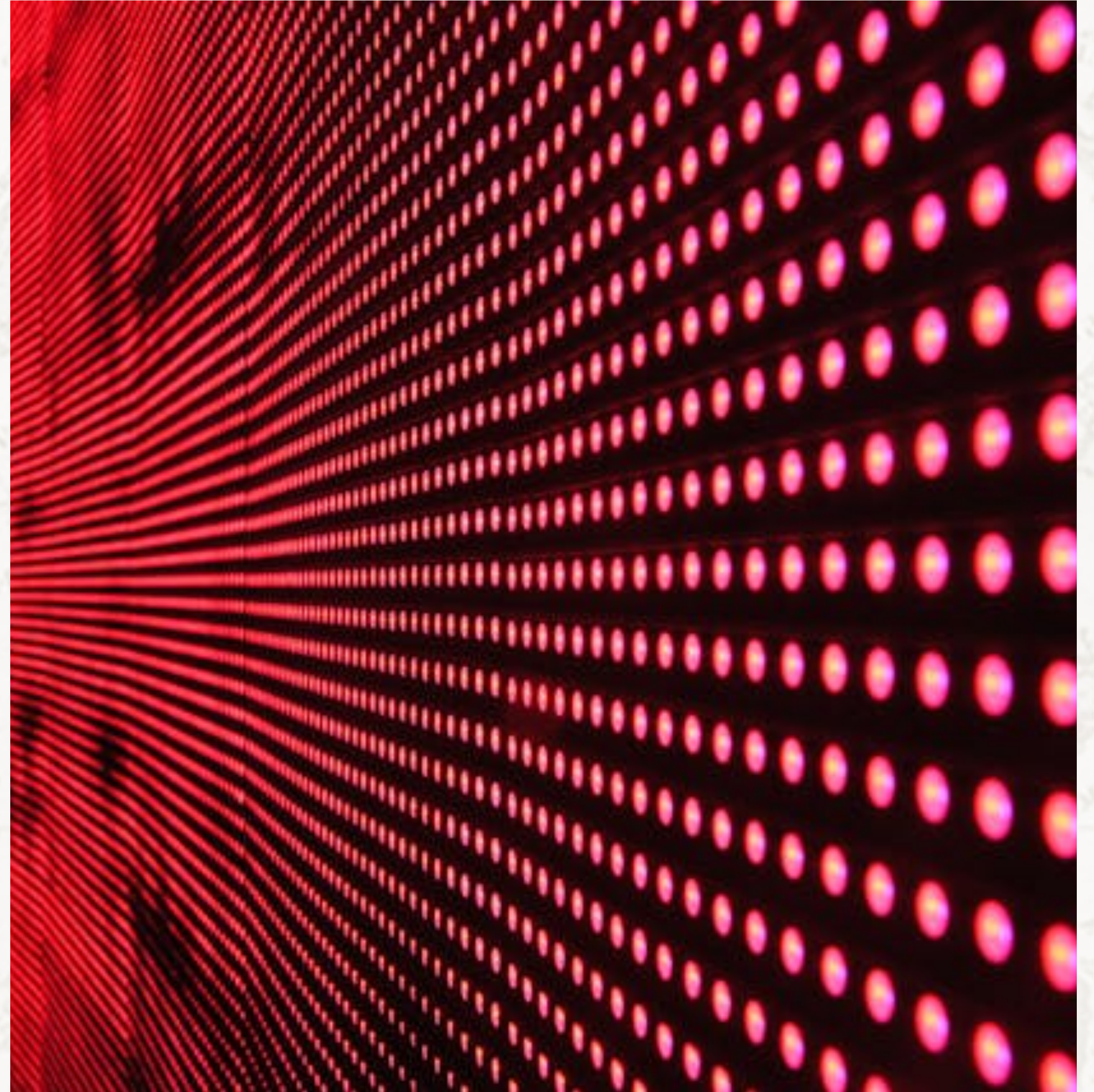
# More Problems





# Extrapolation

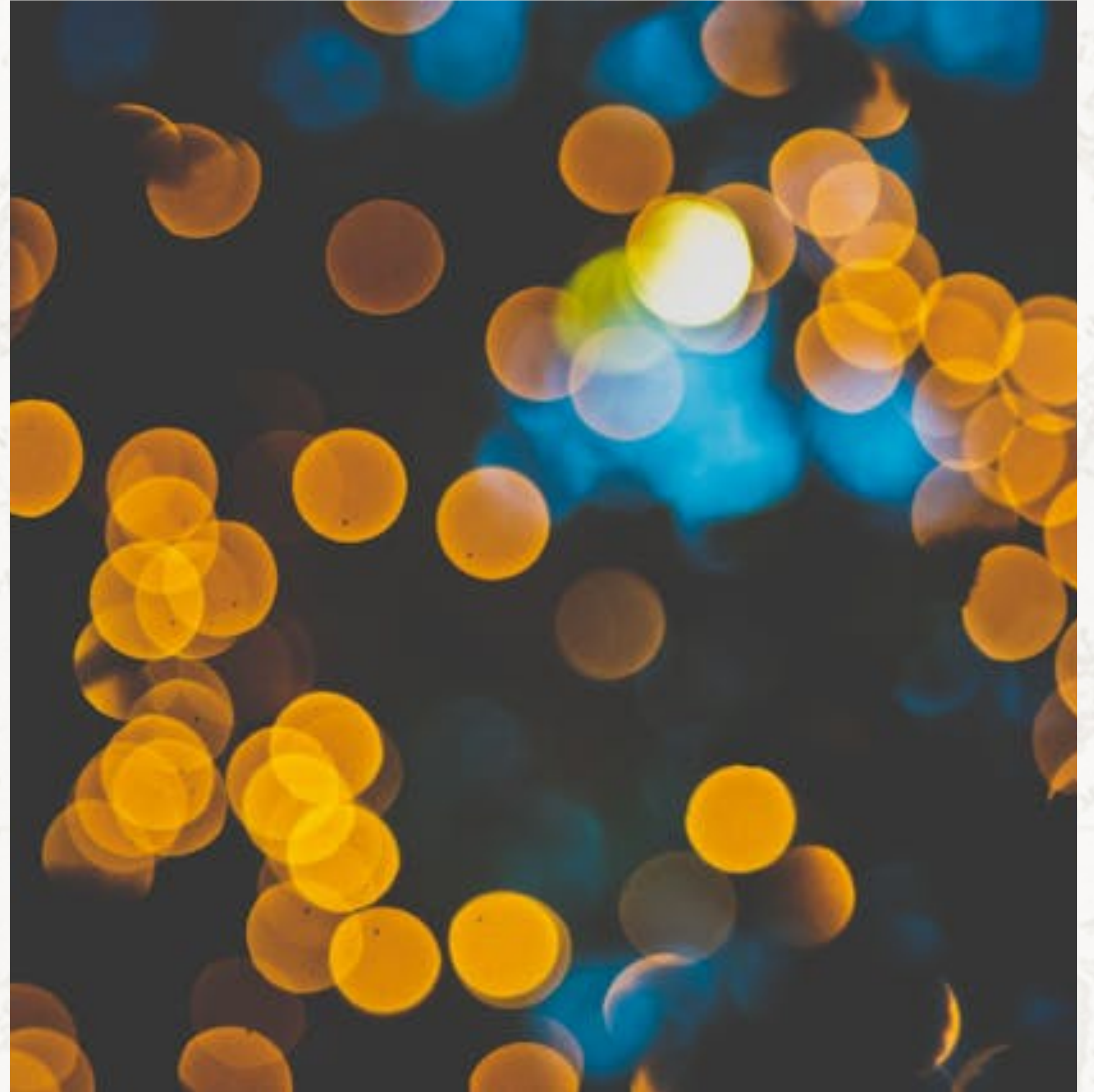
## More Problems





# Prediction Certainty

## More Problems





# Assumptions

## More Problems

Functional Form – true relationship

Independence of observations

Homoscedasticity – residuals  
constant across range

Normality – residuals are normally  
distributed

Multicollinearity – independent  
variable are not perfectly correlated



**Are you benefiting from**

**proper data analysis?**



# Additional Comments and Questions



# Thanks

**see more at [AccendoReliability.com](https://AccendoReliability.com)**