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# How to Check a Regression Fit





Data



Models

# Decisions



When do you trust a  
model?

# Models



# Uses of Models

## Models

To understand a complex system

To identify improvements

To...



# Assumptions

## Models

Reflects important relationships

Predictor for future events

Simple, yet just simple enough

Complex, yet just complex enough



# Never Accurate Models

“All models are wrong, but...”

There still is error

There still are variations



**What are your**

**favorite models?**

# Errors



# Measurements

## Errors

All models are built from data

All data is measured

All measurements have errors

Therefore, all models have errors



# Natural Variability

## Errors

No two items are the same  
at some level

The trick is focusing on  
what variability matters



# Expected Pattern

## Errors

Given very low measurement error  
and normal item-to-item variability

What should we expect?



How to you check

your models?

# Fit Evaluation



# Metrics

## Fit Evaluation

$r^2$  square of the correlation coefficient

$R^2$  square of the coefficient of multiple correlation

Kolmogorov-Smirnov test

Anderson-Darling test, Cramér-van Mises criterion

Chi-squared test

Akaike information criterion

Shapiro-Wilk test

etc



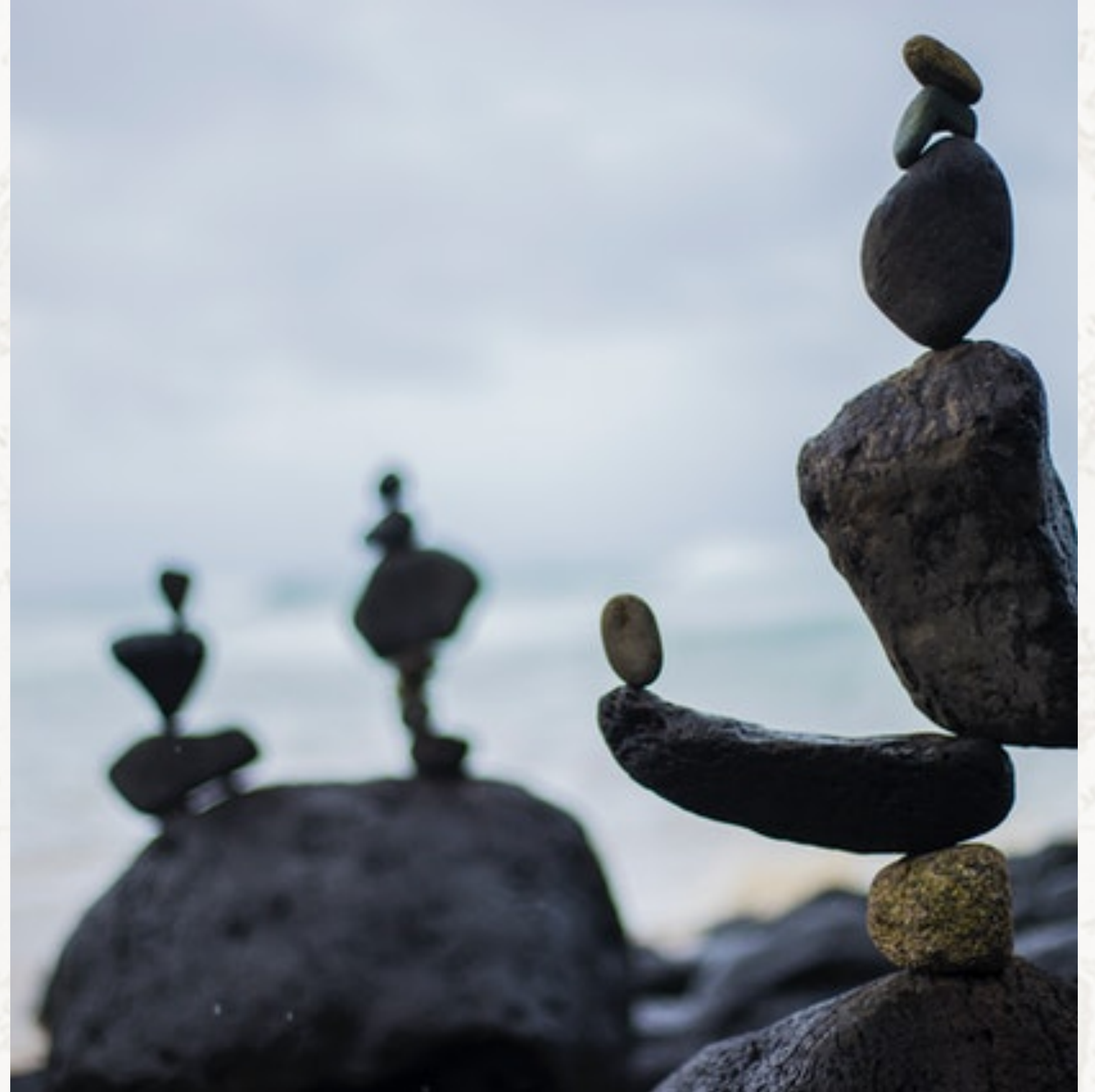
# Residuals

## Fit Evaluation

Difference between individual data points and associated predicted value from the model

The bits not explained by the model





**How does your stat app**

**check residuals?**

Goodness of fit  
should be checked.

# Thanks

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