



Lecture 29

Correlation

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Announcements

Prediction

Guessing the Future

- Based on incomplete information
 - One way of making predictions:
 - To predict an outcome for an individual,
 - find others who are like that individual
 - and whose outcomes you know.
 - Use those outcomes as the basis of your prediction.
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Association

Two Numerical Variables

- Trend
 - Positive association
 - Negative association
- Pattern
 - Any discernible “shape” in the scatter
 - Linear
 - Non-linear

Visualize, then quantify

(Demo)

Correlation Coefficient

The Correlation Coefficient r

- Measures **linear** association
- Based on standard units
- $-1 \leq r \leq 1$
 - $r = 1$: scatter is perfect straight line sloping up
 - $r = -1$: scatter is perfect straight line sloping down
- $r = 0$: No linear association; *uncorrelated*

(Demo)

Definition of r

Correlation Coefficient (r) =

average of	product of	x in standard units	and	y in standard units
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Measures how clustered the scatter is around a straight line

Watch Out For ...

- Nonlinearity
 - Outliers
 - Ecological Correlations
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