# 2.5: Two Quantitative Variables: Scatterplots and Correlation

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#### Ex: (Election Margin Data from chart at beginning of Section 2.5)

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- What was the lowest approval rating among the winning presidents?

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Ex: (Election Margin Data from chart at beginning of Section 2.5)

Questions:

- What was the highest approval rating among the losing presidents?
- What was the lowest approval rating among the winning presidents?
- Make a conjecture about the approval rating needed to win an election.

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- Explanatory variable on horizontal axis (if possible).

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Look at scatterplot of Election Margin Data.





- Is there an obvious pattern/trend?
- Positive or Negative? Other pattern? Linear?



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Are there any outliers?

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- Positive or Negative? Other pattern? Linear?
- Are there any outliers?

The Election Margin example data seem to have a strong, positive linear trend.

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- A correlation near 0 does not mean the two variables are not associated! This does mean that there is no linear relationship present. (Example 2.37 from text)
- Correlation can be heavily influenced by outliers. (Example 2.38 from text)

### The Formula for r

$$r = \frac{1}{n-1} \sum \left(\frac{x-\bar{x}}{s_x}\right) \left(\frac{y-\bar{y}}{s_y}\right)$$

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Anything familiar?