Chapter 7: Scatterplots, Association, and Correlation

Key Vocabulary:

- scatterplot
- association
- direction
- form
- scatter
- explanatory variable
- response variable
- correlation coefficient

Calculator Skills:

- r-value
- linear regression
- make a scatterplot

1. What type of graph is used to show the relationship between two quantitative variables?

2. When describing a *scatterplot*, what four things should you always mention?

3. What is meant by an *explanatory variable*?

4. What is meant by a *response variable*?

5. What does *correlation* measure?

6. Explain the difference between *association* and *correlation*?

7. What three conditions are necessary in order to use *correlation* as a measure of *association*?

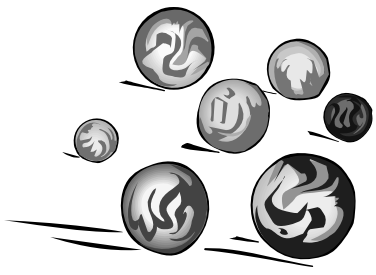
8. What does the sign of the *correlation coefficient* tell you about the association?

9. What does a *correlation* near 1 or – 1 indicate?

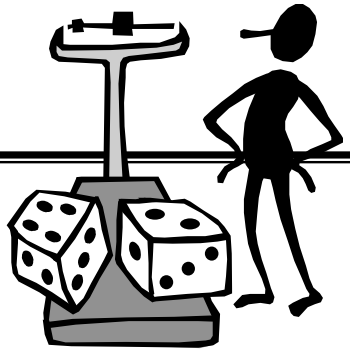
10. What does a *correlation* near 0 indicate?

11. Sketch an example of a scatterplot that shows two variables with a strong *association* but a weak *correlation*.

12. Is correlation *resistant* or *nonresistant* to outliers? Explain.



Chapter 8: Linear Regression



Key Vocabulary:

- parameter
- linear model
- predicted value
- residual
- line of best fit
- slope
- $\hat{y}$
- mean-mean point
- regression line
- R^2
- coefficient of determination

Calculator Skills:

- LinReg (a + bx)
- RESID

1. Explain the quote (by George Box, a famous statistician), "All models are wrong, but some are useful."

2. What are the *parameters* of the Normal model?

3. Describe the difference in notation between y and $\hat{y}$.

4. What is a *residual* and how is it calculated?

5. What does a negative *residual* indicate? A positive *residual*? A *residual* of zero?

6. How many *residuals* does a set of data have?

7. What is meant by a *line of best fit*?

8. The *line of best fit* always passes through which point?

9. The R^2 value shows how much of the *variation* in the response variable can be accounted for by the linear regression model. If $R^2 = 0.95$, what can be concluded about the relationship between x and y?

   _____ % of the variability in _____ is accounted for by the linear relationship with _____.

10. What conditions are necessary before using a *linear model* for a set of data?

11. Explain how to construct a *residual plot*.

12. If a *least-squares regression line* fits the data well, what characteristics should the *residual plot* exhibit? Sketch a well-labeled example.