

Assignment 1

Due Monday, May 28

1. 2.03. Chapter 2, page 22.
2. 2.11. Chapter 2, page 24.
3. For the observations 2781, 2900, 3013, 2856, 2888
 - a. Calculate the sample mean and sample median.
 - b. Calculate the sample variance using the computational formula. (Hint: First subtract a convenient number from each observation.)
4. The first four deviations from the mean in a sample of $n = 5$ reaction times were .3, .9, 1.0, and 1.3. What is the fifth deviation from the mean? Give a sample for which these are the five deviations from the mean.
5. 2.15. Chapter 2, page 25.
6. 2.16. Chapter 2, page 25.
7. 2.21. Chapter 2, page 26. Also calculate the correlation coefficient.
8. 3.08. Chapter 3, page 49.
9. 3.09. Chapter 3, page 49.
10. Each of a sample of four home mortgages is classified as fixed rate (F) or variable rate (V).
 - a. What are the 16 outcomes in S .

- b. Which outcomes are in the event that exactly three of the selected mortgages are fixed rate?
 - c. Which outcomes are in the event that all four mortgages are of the same type?
 - d. Which outcomes are in the event that at most one of the four is a variable-rate mortgage?
 - e. What is the union of the events in part (c) and (d), and what is the intersection of these two events?
 - f. What are the union and intersection of the two events in parts (b) and (c)?
11. An engineering construction firm is currently working on power plants at three different sites. Let A_i denote the event that the plant at site i is completed by the contract date. Use the operations of union, intersection, and complementation to describe each of the following events in terms of A_1 , A_2 , and A_3 , draw a Ven diagram, and shade the region corresponding to each one.
- a. At least one plant is completed by the contract date.
 - b. All plants are completed by the contract date.
 - c. Only the plant at site 1 is completed by the contract date.
 - d. Exactly one plant is completed by the contract date.
 - e. Either the plant at site 1 or both of the other two plants are completed by the contract date.
12. 3.12. Chapter 3, page 50.
13. Consider randomly selecting a student at a certain university, and let A denote the event that the selected individual has a Visa credit card and B be the analogous event for a MasterCard. Suppose that $P(A) = .5$, $P(B) = .4$, and $P(A \cap B) = .25$.
- a. Compute the probability that the selected individual has at least one of the two types of cards.
 - b. What is the probability that the selected individual has neither type of card?
 - c. Describe, in terms of A and B , the event that the selected student has a Visa card but not a MasterCard, and then calculate the probability of this event.
14. A box contains six 40-W bulbs, five 60-W bulbs, and four 75-W bulbs.

If bulbs are selected one by one in random order, what is the probability that at least two bulbs must be selected to obtain one that is rated 75-W?

15. Computer keyboard failures can be attributed to electrical defects or mechanical defects. A repair facility currently has 25 failed keyboards, 6 of which have electrical defects and 19 of which have mechanical defects.
 - a. How many ways are there to randomly select 5 of these keyboards for a thorough inspection (without regard to order)?
 - b. In how many ways can a sample of 5 keyboards be selected so that exactly two have electrical defect?
 - c. If a sample of 5 keyboards is randomly selected, what is the probability that at least 4 of these will have a mechanical defect?
16. 3.18. Chapter 3, page 50.
17. 3.22. Chapter 3, page 51.
18. 3.25. Chapter 3, page 51.
19. 3.29. Chapter 3, page 52.
20. 3.33. Chapter 3, page 52.