Exercises

6.10.1 In this exercise we will test if our method for generating values of the daily demand works properly.

a. Create a spreadsheet that generates 2000 values of the daily demand.
b. The theoretical expected daily demand is $\sum_{x=1}^{10} x \cdot f(x)$ where $f(x)$ is the relative frequency of demand x. Use the data in Table 6.5 to calculate the expected daily demand.
c. Calculate the average of the 2000 values of the daily demand and compare this number to the theoretical number from part b.
d. Create a relative frequency histogram of the 2000 values of the daily demand and compare these relative frequencies to the relative frequencies found using the data in Table 6.5. Does our method for generating values of the daily demand appear to work properly?

6.10.2 Suppose that the produce department makes \$3 profit for each box of bananas sold (if we don't take into account delivery costs).

a. Add a column of formulas to calculate daily profit. (**Note**: The daily profit is the number of boxes *sold* times \$3, not the number *demanded* times \$3.)
b. Add a formula to calculate the total delivery cost for the year (each delivery costs \$25).
c. Add a formula to calculate the total yearly profit from the sale of bananas.
d. Modify your table to store the profit and add a formula to calculate the average profit from all 100 trials.
e. Find the value of **Days Between Deliveries** that gives the maximum profit. How does this value compare to the solution to the original problem of 8 days between deliveries?

For Further Reading

- For a classic reference on many of the concepts related to simulation, see Hillier, F. and G. Lieberman, *Introduction to Operations Research*, Seventh Edition, McGraw Hill, 2001, pg. 1084 – 1155.
- For a classic reference on everything related to simulation, see Law, Averill M. and W. David Kelton, *Simulation Modeling and Analysis* Second Edition, McGraw–Hill, Inc., 1991.
- For more examples of the concepts in this chapter, see Maki, Daniel and Maynard Thompson, *Mathematical Modeling and Computer Simulation*, Thomson Brooks/Cole, 2006.