A physician wants to develop criteria for determining whether a patient’s pulse rate is atypical, and she wants to determine whether there are significant differences between males and females. The male pulse rates can be summarized as 
\[ \bar{x} = 69.4, \ s = 11.3, \ n = 40 \]
and the female pulse rates can be summarized as 
\[ \bar{x} = 76.3, \ s = 12.5, \ n = 40 \]
(Summary statistics computed from Data Set 1 in Appendix B of the 9th edition of Triola)

1. Construct a 95% confidence interval for the mean pulse rate of all males:

2. Construct a 95% confidence interval for the mean pulse rate of all females:

3. Compare the preceding results. Can we conclude that the population means for males and females are different? Why or Why not?
Solution

1. Construct a 95% confidence interval for the mean pulse rate of all males:

   Since \( df = 39 \), then \( t^* = 2.021 \) (Choose \( df = 40 \) since \( df = 39 \) is not on the table). The standard error is

   \[
   SE_{\bar{x}} = \frac{s}{\sqrt{n}} = \frac{11.3}{\sqrt{40}} = 1.786687,
   \]

   which means the margin of error is

   \[
   m = t^* SE_{\bar{x}} = 3.610894.
   \]

   So a 95% confidence interval for the mean pulse rate of all males is

   \[
   \bar{x} \pm m = 69.4 \pm 3.610894 = (65.79, 73.01).
   \]

   Note: When using a TI-83 or TI-84 calculator, select \text{STAT} \rightarrow \text{TESTS} \rightarrow \text{T-Interval} and enter the appropriate data or statistics.

2. Construct a 95% confidence interval for the mean pulse rate of all females:

   Since \( df = 39 \), then \( t^* = 2.021 \) (Choose \( df = 40 \) since \( df = 39 \) is not on the table). The standard error is

   \[
   SE_{\bar{x}} = \frac{s}{\sqrt{n}} = \frac{12.5}{\sqrt{40}} = 1.976424,
   \]

   which means the margin of error is

   \[
   m = t^* SE_{\bar{x}} = 3.994352.
   \]

   So a 95% confidence interval for the mean pulse rate of all males is

   \[
   \bar{x} \pm m = 76.3 \pm 3.994352 = (72.31, 80.29).
   \]

3. Compare the preceding results. Can we conclude that the population means for males and females are different? Why or Why not?

   Since the confidence intervals overlap, we cannot conclude that the population means for males and females are different.