Homework Solutions
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Exercise 21

(a) Enter the data into the TI-83 and get the statistics. We get $\overline{x} = 555.2$ and $s = 256.86$. The sample size is small, so we need to know that the population is normal before we can proceed. A histogram shows that normality is a reasonable assumption, except that there are somewhat too many low values. We will proceed anyway. From the t-table we get the value of t, using 19 degrees of freedom and 95% confidence. The value is $t = 2.093$. The confidence interval is

$$\begin{aligned}\overline{x} \pm z\left(\frac{s}{\sqrt{n}}\right) &= 555.2 \pm 2.093\left(\frac{256.86}{\sqrt{20}}\right) \\ &= 555.2 \pm 120.21.\end{aligned}$$

If you used `TInterval`, then your answer is $(434.99, 675.41)$.

(b) The margin of error is 120.21. If you used `TInterval`, then subtract 555.2 from the upper limit of 675.41 and get 120.21.

(c) If we followed this procedure many times, with many different samples, in the long run 95% of them would contain the true value of μ.