Problem 1.2-2
To compute the sample mean we have
\[ \sum_{x=1}^{100} x_i = 818 \]
With a sample size of \( n = 100 \) we have,
\[ \bar{x} = \frac{1}{100} \sum_{x=1}^{100} x_i = \frac{1}{100} \cdot 818 = 8.18 \]
So in a large number of trials, you would expect to purchase 8.18 boxes to obtain a full set of prizes.

No, a statistician could not tell “that” family how many boxes they would need to buy in order to get a full set of prizes. A statistician could tell a large number of families (or that same family going out a large number of occasions) that on the average they would expect to buy about 8 boxes to obtain a full set of prizes.

Problem 1.2-7
To calculate the sample mean and variance, with \( n = 98 \) we need two numbers,
\[ \sum_{i=1}^{98} x_1 = 5516 \quad \text{and} \quad \sum_{i=1}^{98} x_1^2 = 315924 \]
Then,
\[ \bar{x} = \frac{1}{98} \cdot 5516 = \frac{394}{7} \approx 56.2857 \text{counts per 10 s} \]
and
\[ s^2 = \frac{1}{n-1} \left( \sum_{i=1}^{98} x_1^2 - \frac{1}{n} \left( \sum_{i=1}^{98} x_1 \right)^2 \right) \]
\[ = \frac{1}{97} \left( 315924 - \frac{1}{98}(5516)^2 \right) \]
\[ = \frac{5452}{97} \]
\[ \approx 56.2062 \text{ counts}^2 \text{ per 100 s}^2 \]