2.10: Chapter 2 Formula Review

2.2 Measures of the Location of the Data

$i=\left(\frac{k}{100}\right)(n+1)$

where i = the ranking or position of a data value,

k = the kth percentile,

n = total number of data.

Expression for finding the percentile of a data value: $\left(\frac{x+0.5y}{n}\right)(100)$

where x = the number of values counting from the bottom of the data list up to but not including the data value for which you want to find the percentile,

y = the number of data values equal to the data value for which you want to find the percentile,

n = total number of data

2.3 Measures of the Center of the Data

$\mu=\frac{\sum fm}{\sum f}$ Where f = interval frequencies and m = interval midpoints.

The arithmetic mean for a sample (denoted by $\bar{x}$) is $\bar{x}=\frac{\text{Sum of all values in the sample}}{\text{Number of values in the sample}}$

The arithmetic mean for a population (denoted by μ) is $\mu=\frac{\text{Sum of all values in the population}}{\text{Number of values in the population}}$

2.7 Measures of the Spread of the Data

$s_x=\sqrt{\frac{\sum fm^2}{n}-\bar{x}^2}$ where $\begin{array}{l} s_x = \text{sample standard deviation} \\ \bar{x} = \text{sample mean} \end{array}$

Formulas for Sample Standard Deviation $s=\sqrt{\frac{\Sigma(x_i-\bar{x})^2}{n-1}}$ or $s=\sqrt{\frac{\Sigma f_i(x_i-\bar{x})^2}{n-1}}$

For the sample standard deviation, the denominator is n - 1, that is the sample size - 1.

Formulas for Population Standard Deviation $\sigma=\sqrt{\frac{\Sigma(x_i-\mu)^2}{N}}$ or $\sigma=\sqrt{\frac{\Sigma f_i(x_i-\mu)^2}{N}}$

For the population standard deviation, the denominator is N, the number of items in the population.