Answer on Question #70890 – Math – Statistics and Probability

Question

What characteristics are important to process when considering a random sample?

Solution

The median is the so-called mean value of an ordered series of values of a random variable:

$$M_e = \begin{cases} \dfrac{x_k + x_{k+1}}{2}, & n = 2k, \\ x_{k+1}, & n = 2k+1, \end{cases}$$

where n is the size of the sample.

Mode is a value that has a higher frequency than others.

The sampling range is the difference between the largest and smallest values of the random sample:

$$R = x_{max} - x_{min}$$

Average sample

$$\overline{X} = \frac{1}{n}\sum_{i=1}^{n} x_i$$

Sample variance

$$\sigma^2 = \frac{1}{n}\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2$$

Unbiased sample variance

$$s^2 = \frac{n}{n-1}\sigma^2 = \frac{1}{n-1}\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2$$

The mean square deviation

$$\sigma = \sqrt{\sigma^2} = \sqrt{\frac{1}{n-1}\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2}$$

The coefficient of variation

$$V = \frac{\sigma}{\overline{X}} \cdot 100\% = \frac{\sqrt{\frac{1}{n-1}\sum_{i=1}^{n} \left(x_i - \overline{X}\right)^2}}{\frac{1}{n}\sum_{i=1}^{n} x_i} \cdot 100\%$$