BANA 3363
Definitions Review

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Random Variable A numerical description of the outcome of an experiment.

Element The entity on which data are collected.

Population The collection of all the elements of interest.

Sample A subset of the population.

Population Parameter A numerical characteristic of a population.

Expected Value The average value of the possible values a random variable can take, weighted by the probability of those outcomes. The expected value of a random variable X is written $\mathbb{E}[X]$.

Probability Distribution A description of how the probabilities are distributed over the values of a random variable.

Sample Statistic A numerical characteristic of a sample, calculated from sample data.

Point Estimate A single value that is to serve as a "best guess" of an unknown population parameter. A sample statistic can serve as a point estimate of a population parameter.

Population Mean The expected value of a random variable X. It is denoted by the greek letter μ.

$$\mathbb{E}[X] = \mu = \frac{1}{N} \sum_{i=1}^{N} x_i$$

Sample Mean The average value of a random variable taken from a sample. It is denoted by $\bar{x}$.

$$\bar{x} = \frac{1}{n} \sum_{i=1}^{n} x_i$$

Population Variance A measure of dispersion of a population. The average squared difference of the random variable from its mean.

$$\sigma^2 = \frac{1}{N} \sum_{i=1}^{N} (x_i - \mu)^2$$

Sample Variance A sample statistic measuring dispersion of a random variable from a sample, used as a point estimate of the population variance.

$$s^2 = \frac{1}{n-1} \sum_{i=1}^{n} (x_i - \bar{x})^2$$

Standard Deviation The square root of the variance.

- Population Standard Deviation: $\sigma = \sqrt{\sigma^2}$.
- Sample Standard Deviation: $s = \sqrt{s^2}$.