Answer on Question # 38571 – Math – Statistics and Probability

A random sample of n=100 will be selected from this population and ^P proportion of couples that are mixed what are the mean and standard deviation of the sampling mean of ^P? 7% of the united states married that are mixed.

Solution

The sample proportion $\hat{p} = \frac{X}{n}$ is a reasonable estimator of the population proportion p, where X is the count of the number of sampled elements possessing the characteristic.
The properties of expectation give

the mean

$$E(\hat{p}) = p = 0.07;$$

the standard deviation

$$sd(\hat{p}) = \sqrt{pq/n} = \sqrt{0.07 \times 0.93/100} \approx 0.026.$$

The properties of the sample mean $\bar{X} = \frac{X_1 + X_2 + \cdots + X_n}{n}$ as an estimator of the population mean μ, if $X_1, X_2, \ldots, X_n$ is a random sample :

$E(\bar{X}) = \mu$

$sd(\bar{X}) = \frac{\sigma}{\sqrt{n}}$