

Answer on Question #46487 – Math – Statistics and Probability

Problem.

A random sample of size 10 from a normal population gives the values, 64, 72, 65, 70, 68, 71, 65, 62, 66, 67.

If it is known that the standard error of the sample mean is $\sqrt{0.64}$, find the 95% confidence limits for the population mean. Also find the population variance.

Solution:

The mean of this sample equals $\bar{x} = \frac{64+72+65+70+68+71+65+62+66+67}{10} = 67$.

For 95% confidence interval $z^* = 1.96$.

The confidence limits for the population mean are equal to $\bar{x} \pm z^* \cdot SE$ ($SE = \sqrt{0.64} = 0.8$) or 65.432 and 68.568.

$$SE = \frac{\sqrt{\text{Var}}}{\sqrt{n}},$$

so the population variance equals $\text{Var} = nSE^2 = 6.4$.

Answer: confidence limits for the population mean are 65.432 and 68.568; the population variance equals $\text{Var} = 6.4$.