

Answer on Question #47510 – Math – Statistics and Probability

A beer company wants to determine the mean weight of a can of its beer. It takes a random sample of 80 such cans (from several thousand cans in its warehouse) and finds that the mean weight is 31.15 ounces and the standard deviation is 0.08 ounce.

1. Compute a 95% confidence interval for the mean weight of the cans in the firm warehouse.
2. Is your answer to 1. based on the assumptions that the weights of the cans of beer in the warehouse are normally distributed? Why or why not?

Solution

1. A 95% confidence interval for the mean weight of the cans in the firm warehouse is

$$\bar{x} \pm z_{\frac{\alpha}{2}} \cdot \frac{s}{\sqrt{n}} = 31.15 \pm 1.96 \frac{0.08}{\sqrt{80}} = 31.15 \pm 0.02 = (31.13; 31.17).$$

2. Yes, my answer to 1. based on the assumption that the weights of the cans of beer in the warehouse are normally distributed. Because of the central limit theorem, many test statistics are approximately normally distributed for large samples. Therefore, this statistical test can be conveniently performed as approximate Z-test (the sample size is large: $n = 80 > 30$).