Chapter 7: Hypothesis Testing with One Sample

Testing a Claim about a Mean: σ is Known

Farmer Example

From his long standing experience, a farmer believes that the mean yield of grain per plot on his farm is **150** bushels. When a new seed introduced on the market was tried on **16** randomly picked plots, the mean yield was **158** bushels. Assume the yield per plot is normally distributed with $\sigma =$ **20** bushels. Is the new seed significantly better? What is the P-value? Let $\alpha = 0.02$.

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Income Example

Statistics Canada reports that of the **57,000** families involved in the Survey of Labour and Income Dynamics, the average family income in 1998 was $\$49,626$. Suppose that $\sigma = 15,000$ is known. Is there enough evidence to suggest that the true average income is not $\$50,000$? Let $\alpha = 0.05$.

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The health of the bear population in Yellowstone National Park is monitored by periodic measurements taken from anesthetized bears. A sample of **54** bears has a mean weight of **182.9 lb**. Assuming that the standard deviation is known to be 121.8 lb, use a **0.10** significance level to test the claim that the population mean of all such bear weights is less than **200 lb**.