Chapter 7: Hypothesis Testing with One Sample

Testing a Claim about a Mean: σ is Known

Cholesterol Example

Cholesterol levels in women aged 21-40 in the U.S. are approximately normal with mean **190 mg/dL** and with standard deviation **40 mg/dL**. Blood tests are performed on **200** female Asian immigrants aged 21-40, and the mean cholesterol level is **181.52 mg/dL**. Is the mean cholesterol level of the immigrants lower than the general female U.S. population aged 21-40? What is the P-value? Let $\alpha = 0.03$.

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A random sample of **100** two-month old babies is obtained and the mean head circumference is found to be **40.6 cm**. Assuming the population standard deviation is known to be **1.6 cm**, use a **0.05** significance level to test the claim that the mean head circumference of all two-month old babies is equal to **40.0 cm**.

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 $\sigma = \mathbf{20}$ bushels. Is the new seed significantly better? What is the P-value? Let $\alpha = 0.02$.