Assignment 10 of CISC 1006

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$$\begin{aligned}\mu =&800\\ \sigma =&40\\ H_0 : \mu =&800\\ H_1 : \mu \neq&800\\ n =&30\\ \overline{X} =&788\end{aligned}$$

Let $Z =$

$$\frac{\overline{X}-\mu}{\frac{\sigma}{\sqrt{n}}} = -\frac{3\sqrt{30}}{10} \approx -1.64$$

Thus,

$$\begin{aligned}p =&P(Z \leq -1.64) + P(Z \geq 1.64)\\ \approx&0.050502583 + 0.050502583\\ =&0.1010 \geq 0.05 = \alpha\end{aligned}$$

Thus, wo can not have sufficient envidence to reject H_0. Therefore, we can conclude the average light time ofeach electrical bulbs is 800 hours against with bigger of lower than 800 hours under the signficant level $\alpha = 0.05$

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$$\begin{aligned}H_0 : \mu \geq&40\\ H_1 : \mu <&40\\ x \sim&Normal\end{aligned}$$

where σ is unknown, $n = 64 > 30$. Thus

$$T = \frac{\overline{X}-\mu}{\frac{s}{\sqrt{n}}} \sim t_\alpha(n-1) \approx Normal(0,1)$$

$$P(T) = P(\frac{38-40}{\frac{5.8}{8}}) = P(-\frac{16}{5.8}) \approx 0.0029 \leq \aleph = 0.05$$

That means that we have enough evidence to reject H_0. We can conclude the mean life $\mu < 40$ is valid under the signficant level $\alpha = 0.05$

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\begin{aligned}
H_0 : \mu \leq & 8 \\
H_1 : \mu > & 8 \\
T = & \frac{\overline{X} - \mu}{\frac{s}{\sqrt{n}}} \\
\sim & t_\alpha(n-1) \approx Normal(0,1) \\
P(T|_\mu) \leq & P(T|_{\mu=8}) \\
= & 1 - P(\frac{8.5-8}{\frac{2.25}{\sqrt{225}}}) \\
\approx & 0.000434 < \alpha = 0.05
\end{aligned}
$$

That means we should reject our null hypothesis. And we conclude that the average value of a man who use TM is more than 8 hourse per week under signficant level $\alpha = 0.05$.

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