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3. $n=10$, $\bar{x}=11.61$, $s=6.05$, $n-1=9$, $1-\alpha=0.98$, $\frac{\alpha}{2}=0.01$

$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1)\frac{s}{\sqrt{n}} = 11.61 \pm t_{0.01}(9)\frac{6.05}{\sqrt{10}}$

$= 11.61 \pm 2.821 \times 1.91$

$= 11.61 \pm 5.39$

$= (6.22, 17.00)$

4. (1) $n=1200$, $\hat{p}=0.31$, $1-\alpha=0.98$

$0.31 \pm z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

$0.31 \pm 2.327\sqrt{\frac{0.31 \times 0.69}{1200}} = 0.31 \pm 0.03 = (0.28, 0.34)$

(2) $n=820$, $x=650$, $\hat{p}=\frac{650}{820}=0.79$

$1-\alpha=0.95$, $\frac{\alpha}{2}=0.025$

$0.79 \pm 1.96\sqrt{\frac{0.79 \times 0.21}{820}}$

$= 0.79 \pm 1.96 \times 0.014$

$= 0.79 \pm 0.01$

$= (0.76, 0.82)$

14. (1) $n=15$, $\bar{x}=1.73$, $s=0.8$, $1-\alpha=0.95$, $t_{\frac{\alpha}{2}}(n-1)$

$= t_{0.025}(14) = 2.145$

$1.73 \pm t_{0.025}(14)\frac{0.8}{\sqrt{15}} = 1.73 \pm 2.145 \times \frac{0.8}{\sqrt{15}}$

$= 1.73 \pm 0.44$

$= (1.29, 2.17)$

(2) $1.73 \pm t_{0.10}(14)\frac{0.8}{\sqrt{15}} = 1.73 \pm 1.345 \times \frac{0.8}{\sqrt{15}}$

$= 1.73 \pm 0.28$

$= (1.45, 2.01)$