3. $n=10$, $\bar{x}=13.63$, $s=6.05$, $n-1=9$, $1-\alpha=0.98$, $\frac{\alpha}{2}=0.01$

$\bar{x} \pm t_{\frac{\alpha}{2}}(n-1)\frac{s}{\sqrt{n}} = 13.63 \pm t_{0.01}(9)\frac{6.05}{\sqrt{10}}$

$= 13.63 \pm 2.821 \times 1.91$

$= 13.63 \pm 5.39$

$= (8.24, 19.02)$

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4. 1) $n=1200$, $\hat{p}=0.33$, $1-\alpha=0.98$, $\frac{\alpha}{2}=0.01$

$0.33 \pm z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}$

$= 0.33 \pm 2.327 \times \sqrt{\frac{0.33 \times 0.67}{1200}}$

$= 0.33 \pm 0.3 = (0.3, 0.36)$

2) $n=820$, $x=650$, $1-\alpha=0.95$, $\frac{\alpha}{2}=0.025$

$\hat{p} = \frac{650}{820} = 0.79$

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

$= 0.79 \pm 1.96 \times 0.014$

$= 0.79 \pm 0.03$

$= (0.76, 0.82)$

14. $n=15$, $\bar{x}=1.73$, $s=0.8$, $1-\alpha=0.95$, $\frac{\alpha}{2}=0.025$

$t_{\frac{\alpha}{2}}(n-1) = t_{0.025}(15-1) = 2.145$

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

$= 1.73 \pm 0.44$

$= (1.29, 2.17)$

$1-\alpha=0.8$, $\frac{\alpha}{2}=0.1$, $t_{0.1}(14)=1.345$

$1.73 \pm 1.345\frac{0.8}{\sqrt{15}}$

$= 1.73 \pm 0.28$

$= (1.45, 2.01)$