Week 3 實習課作業.

3.

解： $n=10 \Rightarrow \bar{x}=13.63$ ，$S=6.05$ ，$n-1=9$ ，$1-\alpha=0.98$

$\frac{\alpha}{2}=0.01$ ．　$t_{0.01}(9)=2.821$．

∴ μ 之98%信賴區間为　$\bar{x}\pm t_{\frac{\alpha}{2}}(n-1)\frac{S}{\sqrt{n}}=13.63\pm t_{0.01}(9)\frac{6.05}{\sqrt{10}}$

$=13.63\pm 2.821\times 1.91$

$=13.63\pm 5.39$

即 $(8.24, 19.02)$、

4. (1) $1-\alpha=0.98$．，$\frac{\alpha}{2}=0.01$．　$Z_{\frac{\alpha}{2}}=Z_{0.01}=2.327$．

∴ P 之98%信賴區間为 $\hat{p}\pm Z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}=0.33\pm 2.327\times\sqrt{\frac{0.33\times 0.67}{1200}}$

$=0.33\pm 0.03$．

即 $(0.30, 0.36)$

(2) $n=820$．$x=650$，$\hat{p}=\frac{x}{n}=\frac{650}{820}=0.79$．　$1-\alpha=0.95$，$\frac{\alpha}{2}=0.025$．

$Z_{\frac{\alpha}{2}}=Z_{0.025}=1.96$．　∴ P 之95%信賴區間

$\hat{p}\pm Z_{\frac{\alpha}{2}}\sqrt{\frac{\hat{p}(1-\hat{p})}{n}}=0.79\pm 1.96\times\sqrt{\frac{0.79\times 0.21}{820}}$

$=0.79\pm 1.96\times 0.014$

即 $(0.76, 0.82)$ $=0.79\pm 0.03$