Assignment On Confidence Interval

(1) $n = 1000$

$\mu_{sample} = 180$

$\sigma_{sample} = 30$

$\mu \pm 2SE$

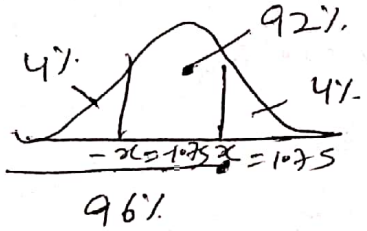
$= 180 \pm 2\left(\frac{30}{\sqrt{1000}}\right)$

$= 180 \pm 1.897$

$= \boxed{181.89 - 178.1}$

(2) $\sigma_{POP} = 3.6$

a) $n = 120$, $\mu_{sample} = 16.2$



Stats.norm.ppf(0.96)

$16.2 \pm 1.75\left(\frac{3.6}{\sqrt{120}}\right)$

16.2 ± 0.575

$\Rightarrow \boxed{15.625 \text{ to } 16.77}$

b) $Z(SE) = \pm 15\,sec = 0.25\,mnts$

$1.75\left(\frac{3.6}{\sqrt{n}}\right) = 0.25$

$n = 635$

(6) $\sigma_{POP} = 5\,mnts$

$n = 64$

$\sigma_{SOSD} = \frac{5}{\sqrt{64}}$

$\mu_{sample} = 42$

$42 \pm 2\left(\frac{5}{\sqrt{64}}\right)$

$= 42 \pm 1.25$

$= \boxed{40.75 - 43.25}$

(9) $\mu_{sample} = 141$, $n = 16$

$\sigma_{sample} = 4$

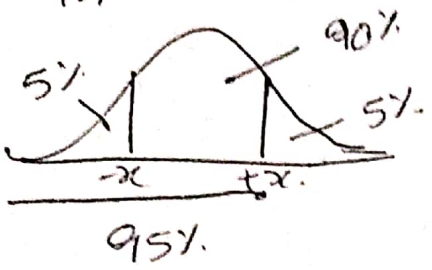
$141 \pm 2\left(\frac{4}{\sqrt{16}}\right)$

$= \boxed{139 - 143}$

(11) $n = 100$

$M_{sample} = 49$

$\sigma_{pop} = 4.49$



stats.norm.ppf(0.95)

$49 \pm 1.64\left(\frac{4.49}{\sqrt{100}}\right)$

49 ± 0.736

$48.264 - 49.736$

(9) a) 0.95, 1.02, 1.01, 0.98

$M = \frac{3.96}{4} = 0.99$

$\sigma = \sum \frac{(x-M)^2}{n-1}$

$= 0.0001$

95% confidence

$\mu \pm 2SE$

$0.99 \pm 2\left(\frac{0.0001}{\sqrt{4}}\right)$

$= 0.99 \pm 0.0001$

$\Rightarrow 0.9899 - 0.9901$

b) H_0 = scale accurate

$H_a \neq$ scale accurate

Yes, It gives evidence at 95 CI that the scale is not accurate.

(5) $M = 45$ sec

$M_{sample} = 49.2$ sec $\quad n = 9$

$\sigma = 3.5$ sec

H_0 = mean time same

H_a = mean time changes

95% CI

~~$\mu \pm 2SE$~~

$49.2 \pm 2\left(\frac{3.5}{\sqrt{9}}\right)$

$\Rightarrow 49.2 \pm 2(1.16)$

$\Rightarrow 49.2 \pm 2.32$

$\Rightarrow 46.88 - 51.52$

$Z = \frac{x-\mu}{\frac{\sigma}{\sqrt{n}}} = \frac{4.02}{1.16}$

$= 3.62$

area under curve = 0.99

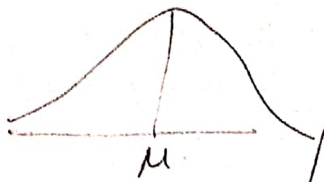
So Reject null hypothesis

1, 2, 6, 9, 11 $n=4$

(4) 0.95
1.02
1.01
0.98

a) $\mu \pm 2SE$

$\mu \pm 2$



confidence interval

7, 3, 8

(11) & $n=100$

$\mu_s = 49$

$\sigma_{pop} = 4.49$

$\mu \pm 1.64\ SE$

$49 \pm 1.64\left(\frac{4.49}{\sqrt{100}}\right)$

(7) $n=17$

$\Sigma d_i = -3.50$

$\Sigma\Sigma d_i^2 = 19.13$

(8) $n=?$

95% CI μ

$\sigma_{pop} = 9cm$

(9) $\bar{x}=150$

$n=16$

$\mu_{price\ sample}=141$

$\sigma_{sa}=4$

$\mu \pm 2\ SE$

$141 \pm 2\left(\frac{4}{\sqrt{16}}\right)$

139 − 143

(12) $n=1200$

175 fraud

$\frac{175}{1500} = \frac{0.5}{1200}$

$\frac{175}{100} \pm 2\left(\sqrt{\frac{175 \times 1025}{1200}}\right)$

(13) $n=59$

15 left hand

?% of left handed

$\frac{15}{59} \pm 2\left(\sqrt{\frac{15 \times 44}{59}}\right)$

(14) $2 * SE = 100$

$1.64 * \left(\frac{475}{\sqrt{n}}\right) = 100$

(15) $\mu \pm 2\ SE$

$55.3 \pm 2\left(\frac{\text{Variance}}{}\right.$

$\left.\frac{161.29 + 176.89 + 18.49 + 2.89 + 0.49 + 610.09 + 106.09 + 256.69 + 372.49 + 561.69}{9}\right)$

(10) $\frac{3314}{17096} \pm 1.64\left(\sqrt{\frac{3314 \times 13782}{17096}}\right)$