Assignment - 1

1. For the Quant test of CAT Exam the population standard deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% CI about mean?

⇒ $\sigma = 100$, $n = 25$, $\bar{x} = 520$

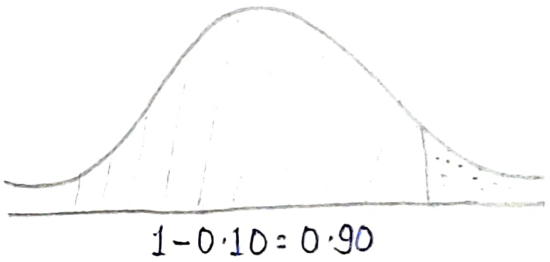
CI = 80%

Confidence Interval = Point estimate ± margin of error

$$\bar{x} \pm Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$$

$\alpha = 1 - 0.80$
$= 0.20$,

$Z_{\frac{0.20}{2}} = Z_{0.10} = 1.3$



Lower fence $= \bar{x} - Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$

$= 520 - 1.3 \times \frac{100}{\sqrt{25}}$

$= 520 - 1.3 \times \frac{100}{5}$

$= 520 - 26$

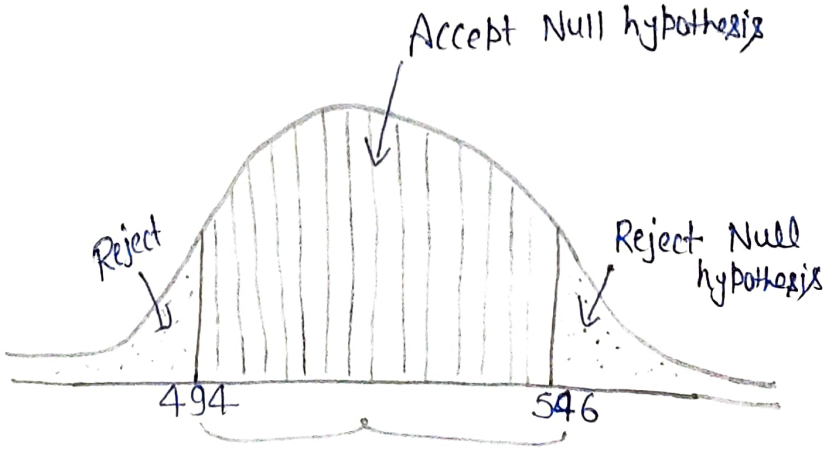
$= 494$

Higher fence $= \bar{x} + Z_{\frac{\alpha}{2}} \frac{\sigma}{\sqrt{n}}$

$= 520 + 1.3 \times 20$

$= 546$

Confidence Interval



Assignment - 2

On the Quant test of CAT Exam, a sample of 25 test takers has a mean of 520 with a sample standard deviation of 80 construct 95% CI about the mean?

$\Rightarrow \quad \bar{x} = 520 \quad , \quad S = 80 \quad , \quad CI = 95\% \quad , \quad n = 25$

Confidence Interval = Point estimate ± margin of error

$$\bar{x} \pm t_{\frac{\alpha}{2}} \frac{S}{\sqrt{n}}$$

first we find α

$\alpha = 1 - 0.95$

$\alpha = 0.05$

Then we find Degree of freedom

$= n - 1$

$= 25 - 1$

$= 24$

$t_{\frac{\alpha}{2}} = 2.064$

lower fence $= \bar{x} - t_{\frac{\alpha}{2}} \frac{S}{\sqrt{n}}$

$= 520 - 2.064 \times \frac{80}{\sqrt{25}}$

$= 520 - 2.064 \times \frac{80^{16}}{5}$

$= 520 - 2.064 \times 16$

$= 486.976$

Higher fence $= 520 + 2.064 \times 16$

$= 553.024$

CI