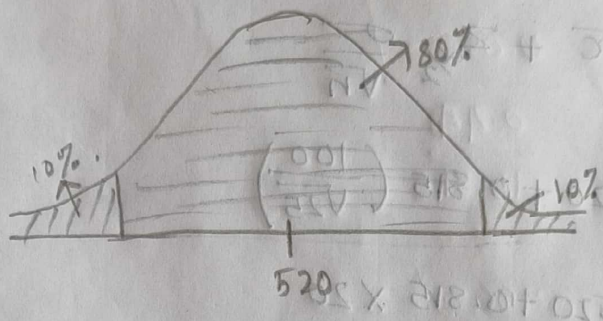
Day 5 Stats

In 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% C.I about mean?

Ans:-

Given:

$\sigma = 100 \quad n = 25 \quad \bar{x} = 520 \quad C.I = 80\%$.



Formula for C.I:

Point Estimate ± Margin of Error.

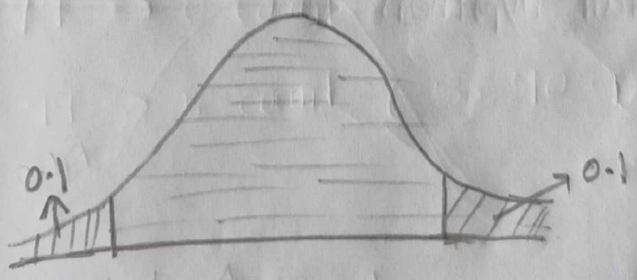
$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

α = Significance Value.

$\alpha = 1 - 80\%$

$\alpha = 0.2\%$

$Z_{0.2/2} = Z_{0.1}$



$1 - 0.1 = 0.9$

The value of 0.9 is 0.815

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

$$= 520 - 0.815 \left(\frac{100}{\sqrt{25}}\right)$$

$$= 520 - 0.815 \times 20$$

$$= 520 - 16.3$$

$$= 503.7$$

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

$$= 520 + 0.815 \left(\frac{100}{\sqrt{25}}\right)$$

$$= 520 + 0.815 \times 20$$

$$= 520 + 16.3$$

$$= 536.3$$