Assignment 4 –

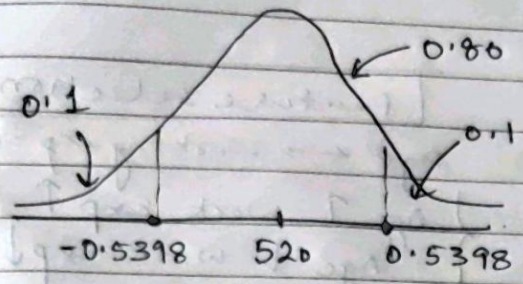
Q. In the quant test of CAT exam, the population standard deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% C.I about the mean.

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

$$H_0 = \begin{cases} \mu = 520 \\ \mu \neq 520 \end{cases}$$

$\because 1 - CI = 0.2$

$1 - 0.80 = 0.2$ //



0.1 (z-table)

↓

0.5398

C.I = Point Estimate ± Margin of Error

$$C.I = \bar{x} \pm Z_{\alpha/2} \times \frac{\sigma}{\sqrt{n}}$$

$$C.I = 520 \pm Z_{0.2/2} \times \frac{100}{\sqrt{25}}$$

$$C.I = 520 \pm Z_{0.1} \times \frac{100}{\sqrt{25}}$$

$$C.I = 520 \pm 0.5398 \times \frac{100}{\sqrt{25}}$$

lower limit

$= 520 - 0.5398 \times \frac{100}{\sqrt{25}}$

$= 509.2$

higher limit

$\Rightarrow 520 + 0.5398 \times \frac{100}{\sqrt{25}}$

$\Rightarrow 530.796$ //

[509.2 ⟷ 530.7] → to accept Null Hypothesis

520 lies b/w 509.2 ⟷ 530.7.

Accept the Null Hypothesis.

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