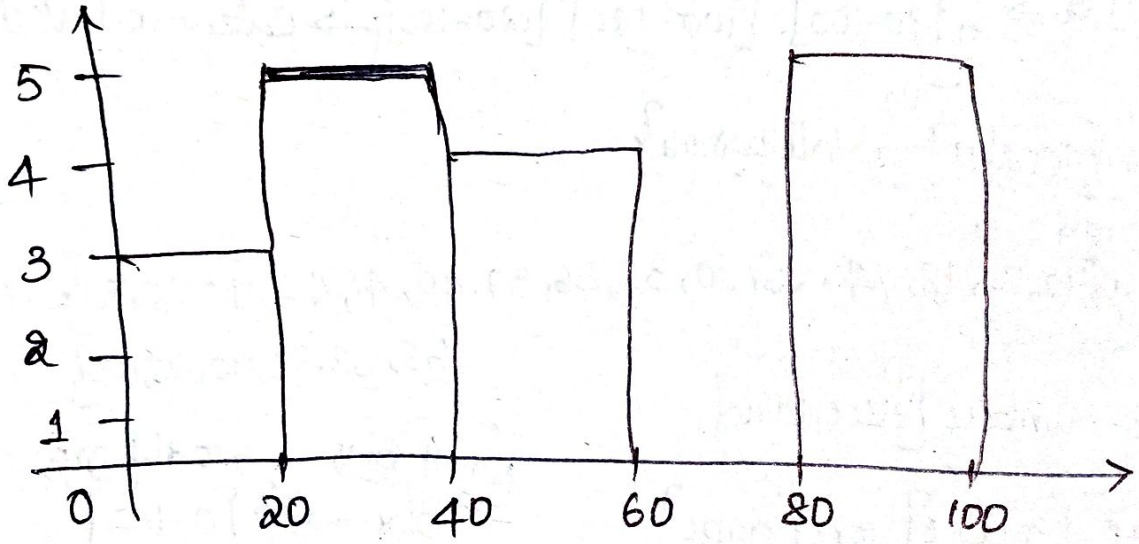
Assignment

Eg: 10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99.

bins = 5

bin size = 20



Assignment

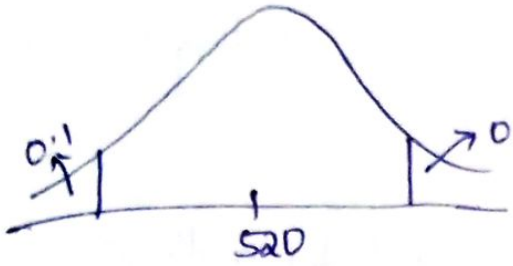
Q. In the Quant test of CAT exam, the population std deviation is known to be 100. A sample of 25 test takers has a mean of 520. Construct a 80% C.I about the mean.

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

Significance value (α)

$1 - C.I = 1 - 0.80$

$= 0.2$



Total area = 1

$1 - 0.1 = 0.9$

$Z_{\alpha/2} = \frac{Z_{0.80}}{2}$

$= Z_{0.1}$

$= 1.29$

Point estimate $\pm$ Margin of error

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

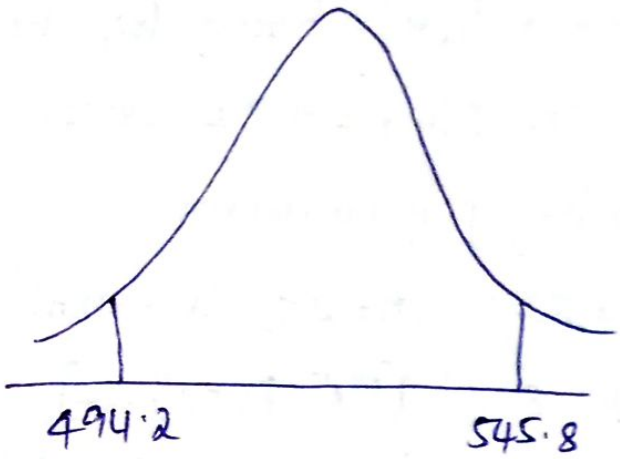
Lower fence $= \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$

$= 520 - 1.29 \times \frac{100}{\sqrt{25}}$

$= 520 - 1.29 \times 20$

$= 520 - 25.8$

$= 494.2$



Higher fence $= 520 + 1.29 \times 20$

$= 520 + 25.8$

$= 545.8$

Assignment

(8) A car company believes that the percentage of residents in city ABC that own a vehicle is 60% (or) less. A sales manager disagrees with this. He conducts a hypothesis testing surveying 250 residents & found that 170 responded yes to owning a vehicle

(a) State the Null & Alternate hypothesis.

(b) At 10% α (sig. value), is there enough evidence to support the idea that vehicle ownership in city ABC is 60% (or) less?

P ⇒ 0.014 (may be)

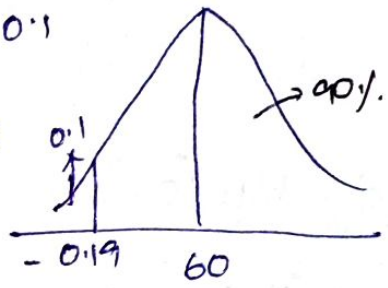
$x = 170, n = 250, \alpha = 0.1$

Ans:- $H_0 :- P_0 \geq 60\%$

$H_1 :- P_0 < 60\%$

$\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$

$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$



Z-test:-

$$Z\text{-test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

$$= \frac{0.08}{\sqrt{\frac{0.24}{250}}}$$

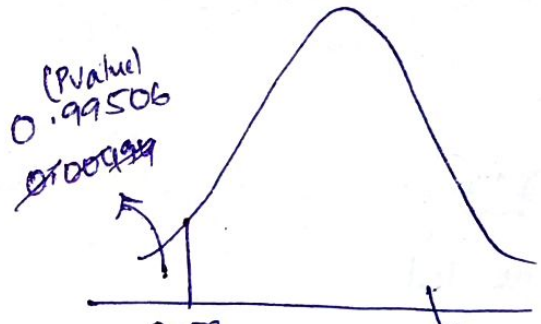
$$= \frac{0.08}{0.0309}$$

$$= 2.58$$

$2.58 \geq 0.19$

(Accept the null hypothesis)

P-value



$1 - 0.99506 = 0.00494$

Pvalue $0.00494 \geq 0.99506$

$0.00494 < \alpha (0.1)$

(Reject)

$0.99506 > 0.1$

(Accept)

Assignment

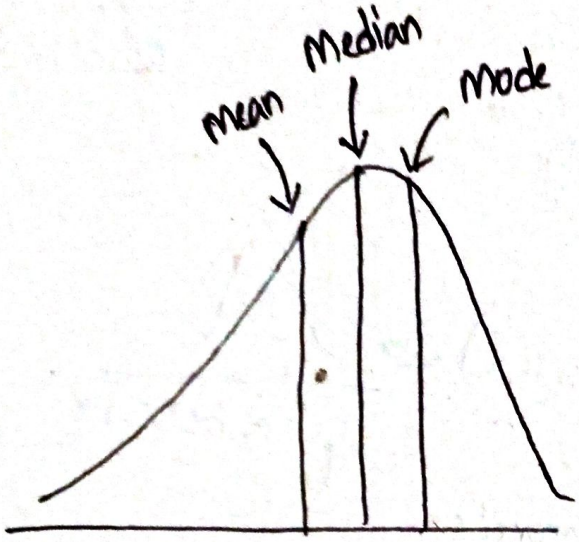
2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

99 percentile ?

$$99 \text{ percentile} = \frac{99}{100} \times (20+1)$$

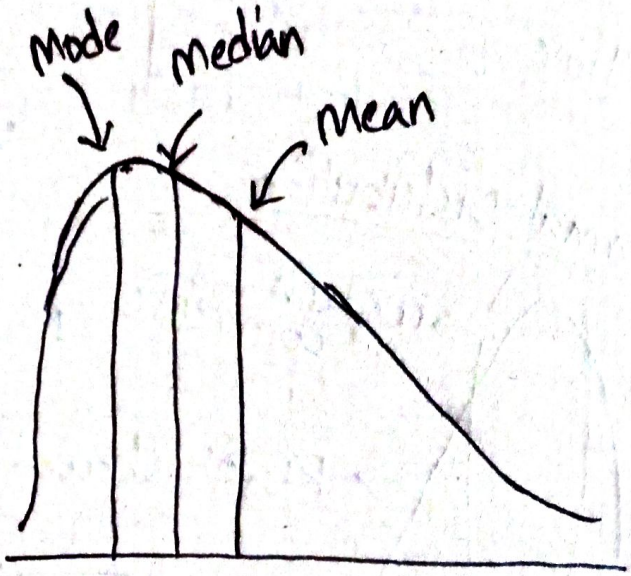
$$= \frac{99}{100} \times 21 = 20.79 \text{ (Index)}$$

ASSIGNMENT:- Relation between Mean, Median & Mode



Left skewed
(Negative skew)

Mode > Median > mean



Right skewed
(Positive skew)

Mean > Median > Mode