Monday 8th Week Day 044-321

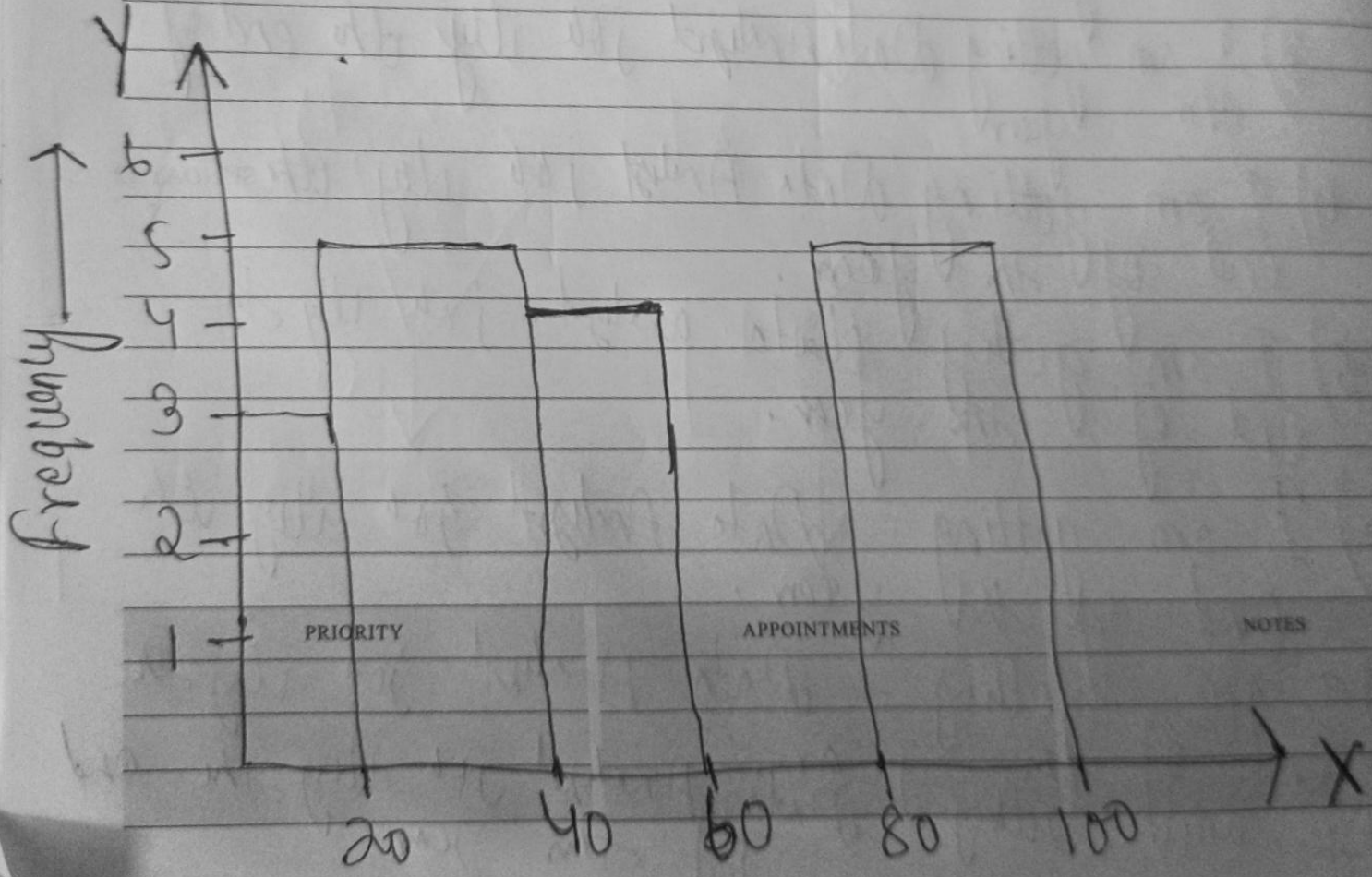
# Assignment Statistics

1) Plot a histogram →

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

Bins - 5

Binsize - 20



2) In Quant test of CAT Exam, the population standard deviation is known to be 100. A sample of 25 test taken has a mean of 520 Construct 80% CI around the mean.

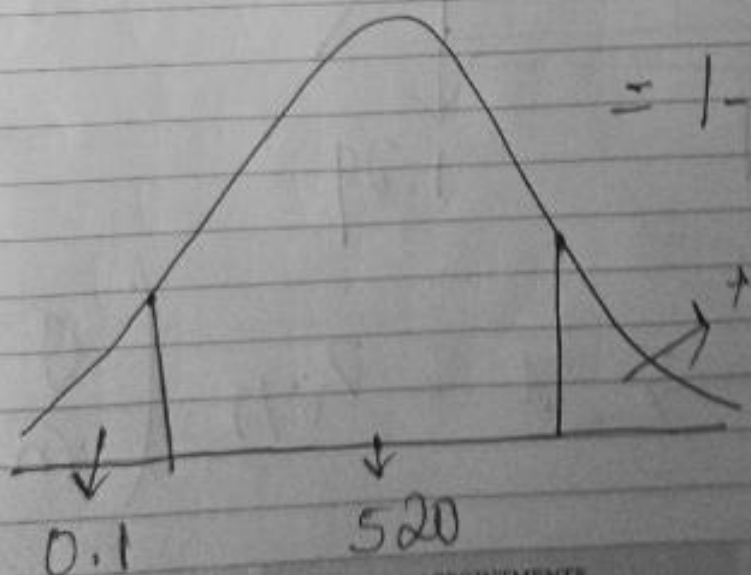
$\sigma \to 100$ $\quad \bar{x} \to 520$

$n \to 25$

$\alpha$ = Significance value $= 1 - CI$

$= 1 - \frac{80}{100}$

$= 1 - 0.8 = 0.2$

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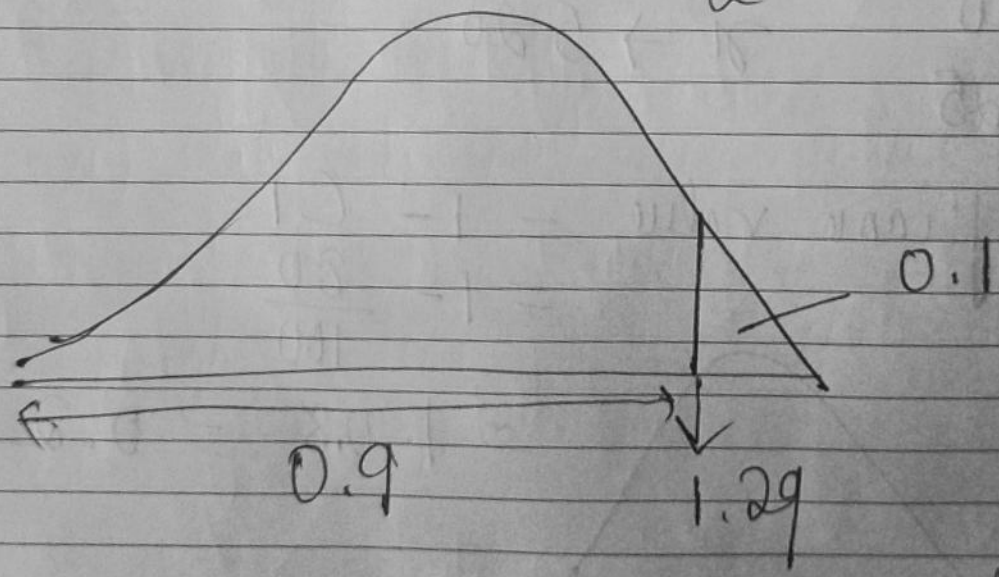
Point estimate $\pm$ margin of error.

$$\bar{x} \pm z\frac{\alpha}{2}\left(\frac{\sigma}{\sqrt{n}}\right)$$

$$z_{\alpha/2} = z_{\frac{0.2}{2}} = z_{0.1}$$




Lower limit $\rightarrow \bar{x} - z_{\alpha/2}\left(\frac{\sigma}{\sqrt{n}}\right)$

$$520 - 1.29\left(\frac{100}{\sqrt{25}}\right)$$

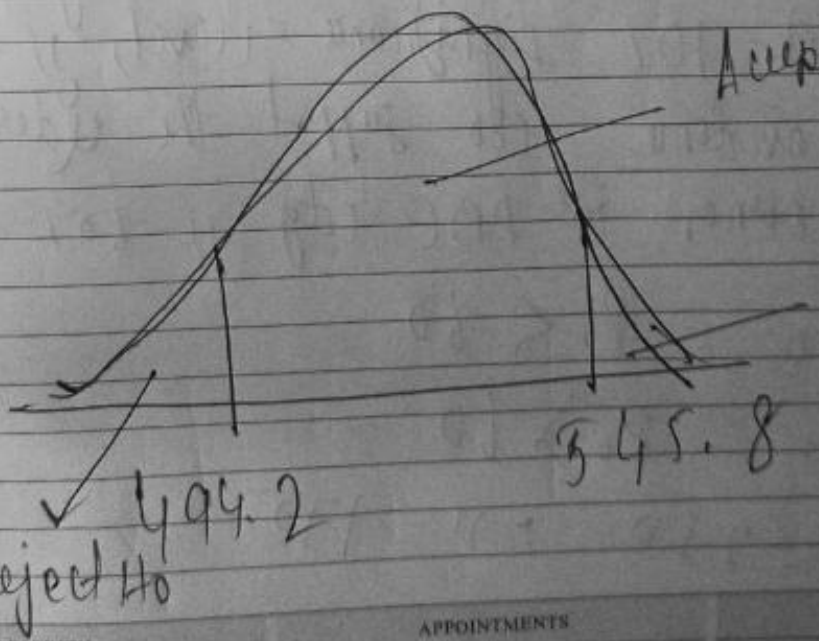
$520 - 1.29 \times 20$

$= 494.2$

Higher one $\bar{x} + z_{\alpha/2} \left(\frac{\sigma}{\sqrt{n}}\right)$

$= 520 + 1.29 \times 20$

$= 545.8$

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3) A car company claiming that the percentage of citizen in city ABC that owns a vehicle is 60%. or less. A sales manager disagrees with this. He conducted a hypothesis testing surveying 250 residents and found that 170 residents responded yes to owning a vehicle.

a) State the null and alternate hypothesis.

b) At a 10% significance level, is there enough evidence to support the claim that vehicle owner in ABC city is 60% or less

$H_0 = P_0 \leq 60$

$H_1 = P_0 > 60$

$n = 250$ , $x = 170$

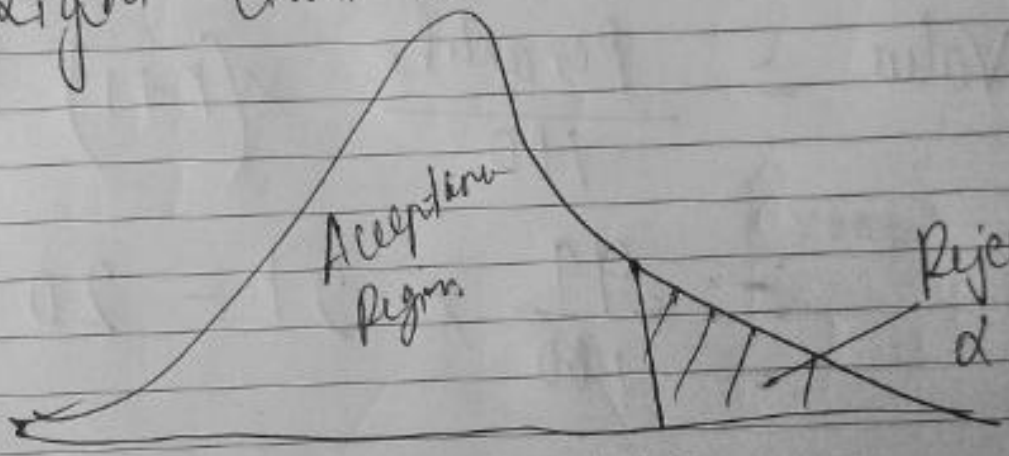
$\hat{P} = \frac{x}{n} = \frac{170}{250} = 0.68$

$q_0 = 1 - p_0 = 1 - 0.6 = 0.4$

$q_0 = 0.4$

$\alpha = 0.10 = 10\%$ significance value.

Right tail test






$$Z \text{ test} = \frac{\hat{p} - p_0}{\sqrt{\frac{p_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}}$$

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$Z = 2.588$

Reject null hypothesis.

FEBRUARY 2017

| M | T | W | T | F | S | S | M | T | W | T | F | S | S |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 |
| 27 | 28 | | | | | | | | | | | | |

4) What is the value of the 99 percentile

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

→ Value = $\frac{\text{Percentile}}{100} \times (n+1)$

$= \frac{99}{100} \times 21 = 20.79$

So 12 is the value of 99 percentile.

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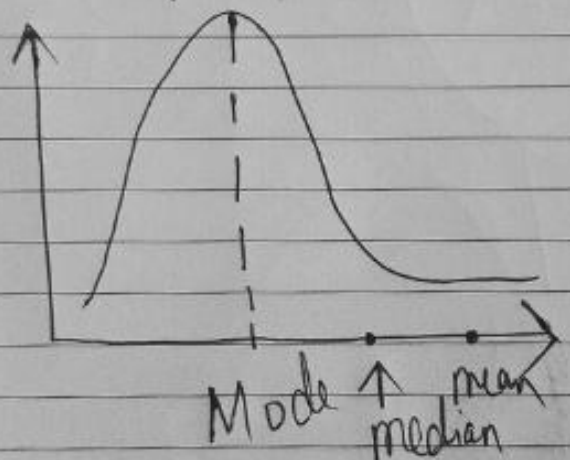
5) In left and right - skewed data, what is the relationship between mean, median and mode. Draw the graph to represent the same -

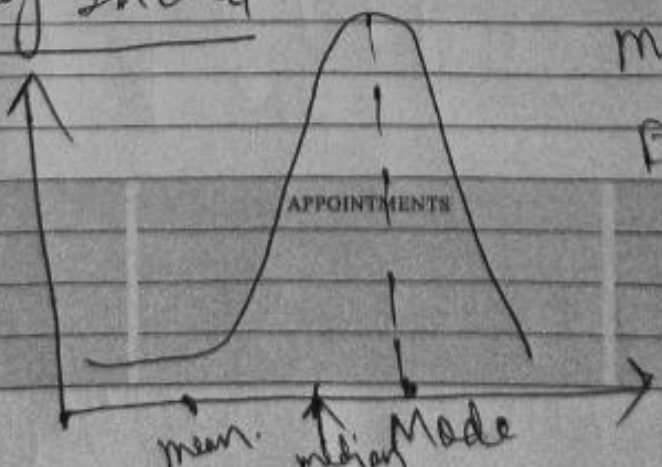
→ Positively skewed.




Example - Wealth Distribution.

mean > median > mode.

Negatively skewed -




mode > median > mean.

Example - Life span of human being.

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