Ineuron.ai assignment on statistics :

Q1) Plot histogram,

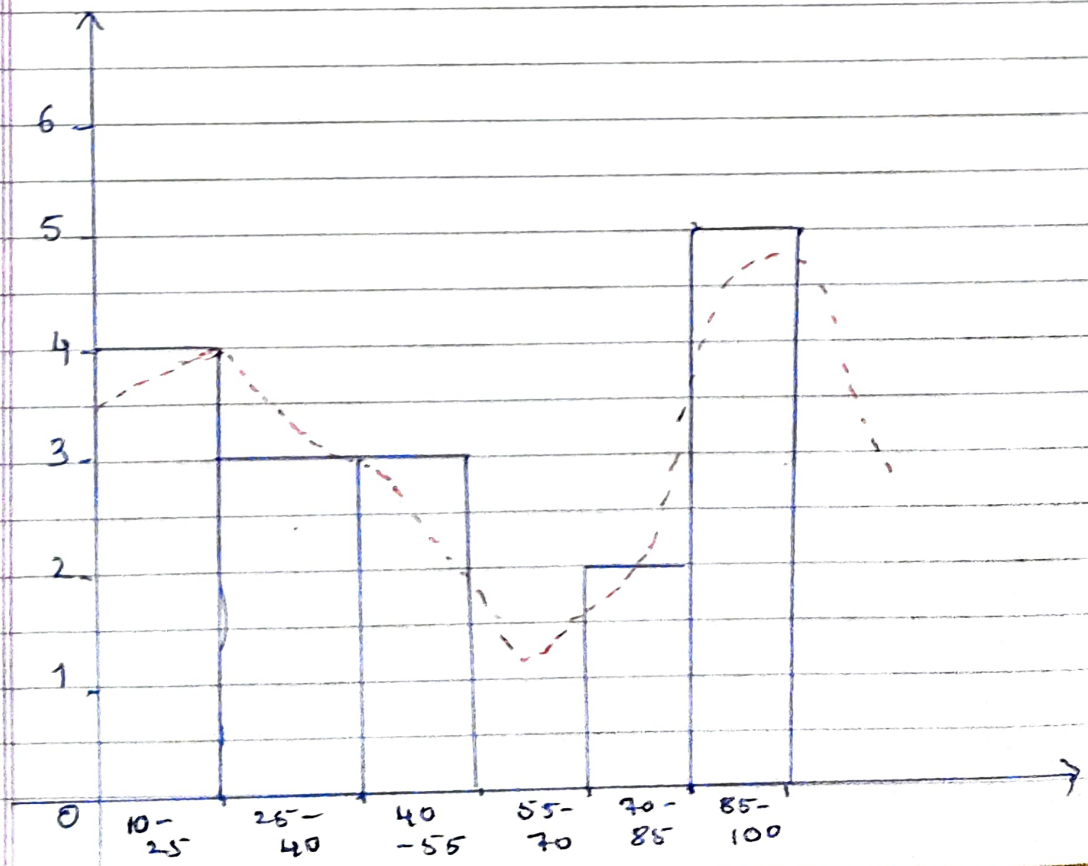
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 91

→ ~~xgong~~

range = max - min
= 99 - 10
= 88

I want 6 bins then bins width would be $88 \div 6 = 14.6 \simeq 15$,
15 is my bin width

bin's	Freq.
10 - 25	4
25 - 40	3
40 - 55	3
55 - 70	2
70 - 85	0
85 - 100	5



Q4) what is the value of 99 percentile?
2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

→ $L_K = \frac{K}{100} \times (n+1)$ Here, $n = 20$
$K = 99$

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

$= 0.99 \times 21$

$= 20.79$ //

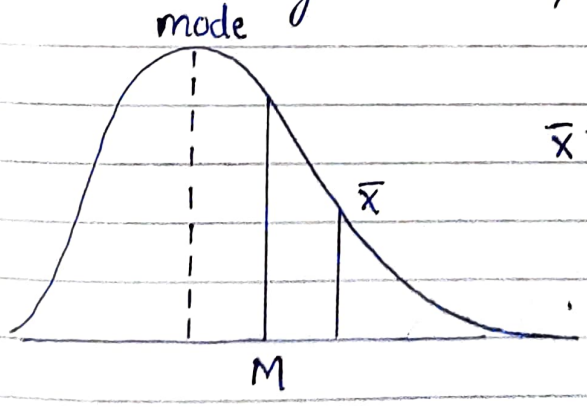
value of 99 percentile is 12 //

Q5) Left and Right-skewed data, what is the relation-ship between mean, median and mode?

→

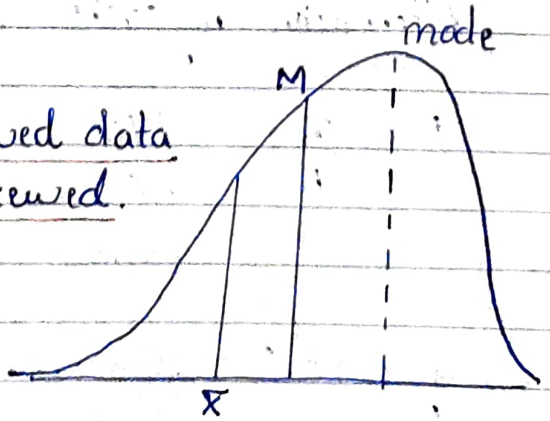
Right Skewed data or positive Skewed data are Skewed to right

Right area > Left area



$\bar{x} > M > mode$

Right < Left Negative Skewed data or Left Skewed.



$\bar{x} < M < mode$

Q3) A Car belives that the % of Citizen in City ABC that owns a vehical is 60% or less. A Sales man manger disagree with this. He Conducted hypothesis testing Survey 250 resident and yaund That 170 rasident respondent Yes for owing a vehicle.

a) State H_0 and H_1

b) At 10% Level of Significant level, is there enough evidence to Support That vehicale owner in ABC City is 60% or less.

→ given,

$\mu = 60\%$

$n = 250$

$x = 170$

LOS = 10 %

$\alpha = 1 - 10\%$

$= 1 - 0.10$

$= 0.90$

$H_0 = \mu \leq 60\% \ (P_0)$

Null hypothesis,

$H_1 = \mu > 60\% \quad (P_1)$

Alternative hypothesis,

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

$= 0.68$ //

$q = 1 - P = 1 - 0.60$

$= 0.40$ //

$$Z_{test} = \frac{P - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.60}{\sqrt{\frac{0.60(0.40)}{250}}}$$

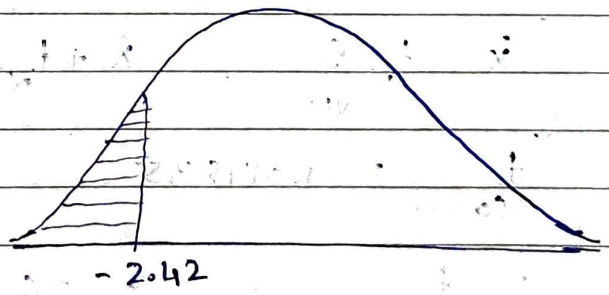
$$= \frac{0.0808}{\sqrt{\frac{0.24}{250}}} = \frac{0.08}{0.03098}$$

$$= 2.582$$

2.582 value in Z table is 0.99506
0.10 in Z table is -2.42

$-2.42 < 2.582$

Reject ~~Accept~~ H_0,



Using p value:

Conclusion: The Citizen of ABC ~~is~~ that owns vehical are more than 60%.

Q2)

given,

S.D = 100 $\quad\quad$ $n = 25$

$\bar{x} = 520$

∴ 80% C.I about the mean (θ) Since our Sample is 25 we approch the problem using 't' statistic

i.e, $t = \frac{\bar{x} - \sigma}{s/\sqrt{n}} \sim t_{(n-1)}$

$\therefore P(|t| \leq t_\alpha) = 1 - \alpha$

$P\left(\left|\frac{\bar{x} - \theta}{s/\sqrt{n}}\right| \leq t_\alpha\right) = 0.8$

i.e

$P\left(\bar{x} - t_\alpha \cdot \frac{s}{\sqrt{n}} \leq \theta \leq \bar{x} + t_\alpha \frac{s}{\sqrt{n}}\right) = 0.80$

∴ The interval is

$\left(\bar{x} - t_\alpha \frac{s}{\sqrt{n}} \quad , \quad \bar{x} + t_\alpha \frac{s}{\sqrt{n}}\right)$

$t_{(0.20)} = 1.317835$

$\therefore t_{(0.20)} \cdot \frac{s}{\sqrt{n}} = 26.3567$

∴

The 80% CI is

$(493.6433 \quad , \quad 546.3567)$