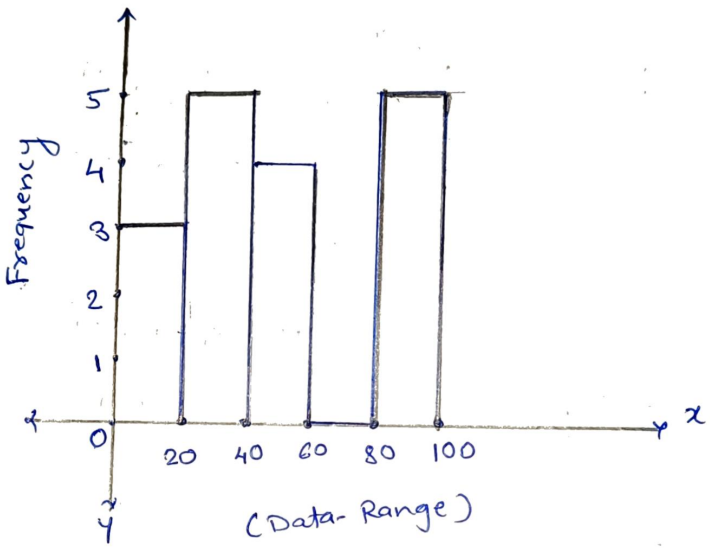
Ques.1] Plot a histogram.

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

→ Bins = 5 ∴ Bin Size = $\frac{100}{5}$

Bin Size = 20

[0 - 100]



Ques.2] In a 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 an 80% CI about the mean?

→ Given

$\sigma = 100$ (population standard deviation)

$n = 25$ (sample of test)

$\bar{x} = 520$ (mean)

C.I = 80 %

$\alpha = 1 - C.I$

$= 1 - 0.80$

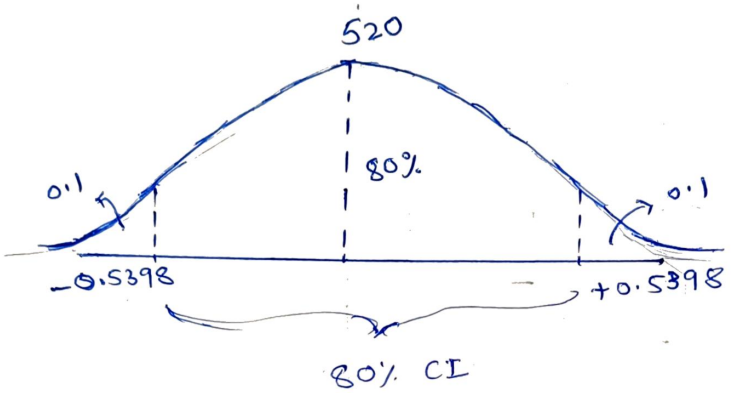
$\alpha = 0.2$

Ques-3]

$$Z_{\frac{\alpha}{2}} = Z_{\frac{0.2}{2}}$$

$$= Z_{0.1}$$

$$= 0.5398$$



Lower fence

$$= \bar{x} - \frac{Z_{\alpha}}{2} \times \frac{\sigma}{\sqrt{n}}$$

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

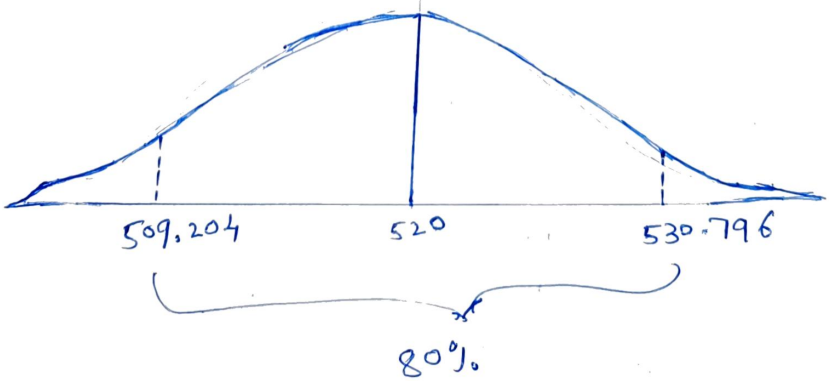
$$= 509.204$$

Higher fence

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

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

$$= 530.796$$



Ques-3] A car belives that the percentage of citizens 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 & found that 170 residents responded yes to owning a vehicle.

(a) State the null & alternate hypothesis

(b) At a 10% significane level, is there enough evidance to support the idea that vehicle owner in ABC city is 60% or less.

→

Null hypothesis

$H_0 : P_0 \leq 60\%$

$H_1 : P_0 > 60\%$

$n = 250$

$x = 170$

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

$q_0 = 1 - P_0$

$= 1 - 0.6$

$= 0.4$

Null hypotheses (H_0)

It claim that there is no effect in the population

Alternate hypotheses (H_1)

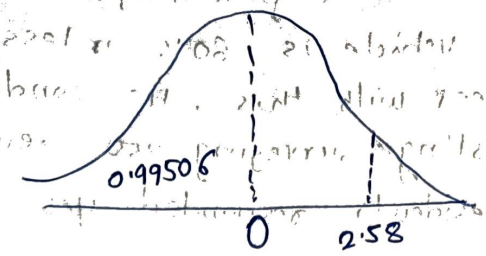
A claim that there is an effect in the population

Z-test

$$Z = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.08}{\sqrt{\frac{0.24}{250}}} = \frac{0.08}{\sqrt{0.00096}}$$

$$= \frac{0.08}{0.030983} = 2.58$$

$$\boxed{Z = 0.99506}$$



CI = 10 % p-value = 1 - 0.99506

CI = 0.1

p-value = 0.00494

p-value < significant value

0.0494 < 0.10

∴ Reject the Null Hypothesis.

we can say that the sales manager is correct

Ques 4) 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

$$\text{Value} = \frac{\text{Percentile}}{100} \times S$$

Sample size (S) = 20

$$P_{99} = \frac{99}{100} \times 20$$

$$= 19.8 \cong 20$$

The 99th percentile will be at index 20.

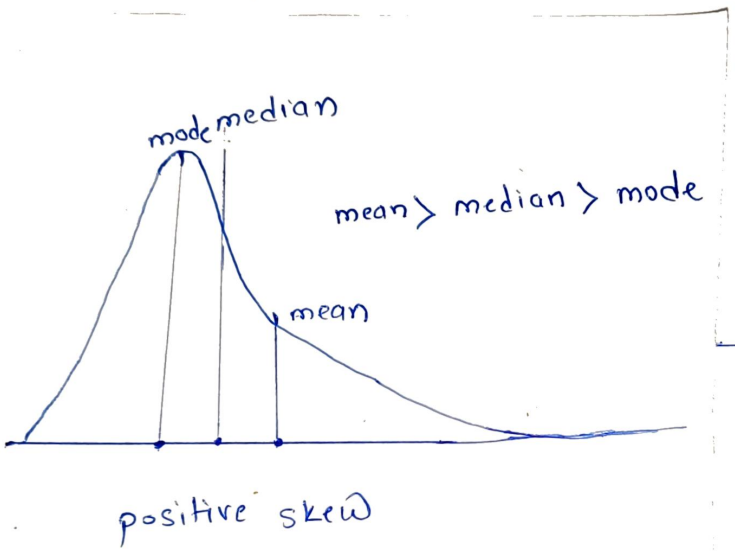
Thus the 99th percentile value is 12

Ques-5] In left & Right skewed data, what is the relationship between mean, median & mode? Draw the graph to represent the same

→

* Right skewed :-

A Right skewed distribution is longer on the right side of its peak than on its left. Right skewed also Refer as a positive skewed.

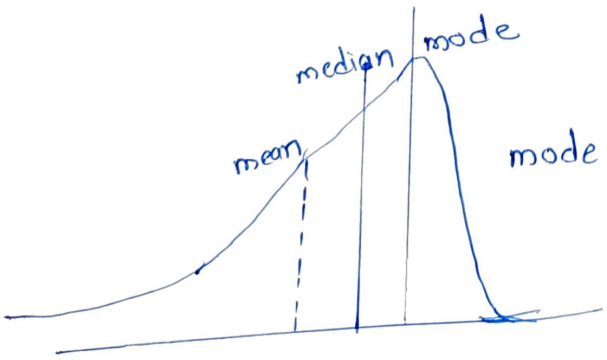


positive skew

The mean of a Right skewed distribution is always greater than its median.

* left skewed

left skewed distribution is longer on a left side of its peak than on Right side. left skewed also refer as negative skew



The mean of a left-skewed distribution is almost always less than its median