Stats Assignment-1

Q① Plot a histogram

A = {10, 13, 18, 22, 27, 32, 28, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99}.

Step - 1

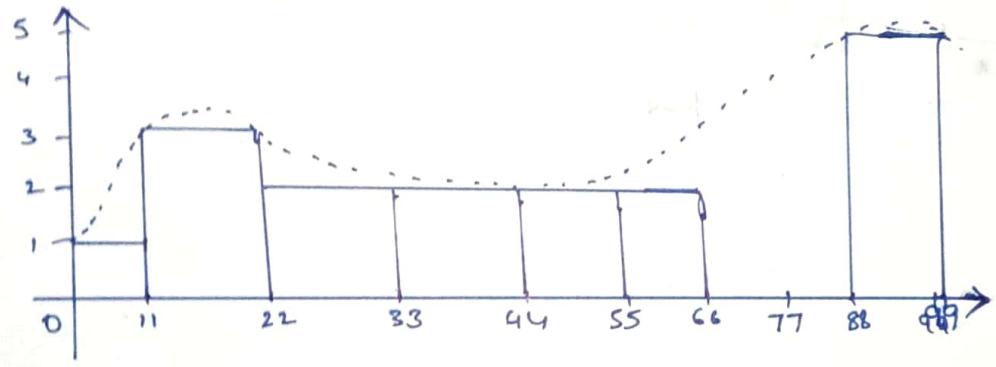
Sort the data in Acending order

Step - 2

specifing bins = 9

Step - 3

Bin size = $\frac{99}{9} = 11$.



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

Population Standard deviation (σ) = 100.

Sample population (n) = 25.

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

confidence interval(CI) = 80%.

"AS we can see, we are provided with population standard deviation that means we have to use "Z-Test".

① significance value (α) = 1 − C.I

= 1 − 0.8

= 0.2

② Margin of error = $Z_{\alpha/2}$

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

= $Z_{0.1}$

If we take total area as 1 ⇒ 1 − 0.1

= 0.9

We have to find the 0.9 in Z table, we can find the value $Z_{0.1} = +1.3$

Now we will calculate lower term and higher term

lower term = $\bar{x} - Z_{\frac{\alpha}{2}} \times \left(\frac{\sigma}{\sqrt{n}}\right)$

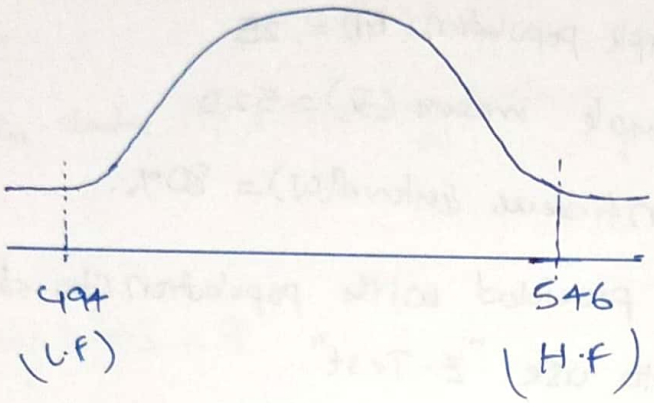
= $520 - 1.3 \times \left(\frac{100}{\sqrt{25}}\right)$

= 494

higher tance $= \bar{x} + z_{\alpha/2} \times \left(\frac{\sigma}{\sqrt{n}}\right)$

$= 520 + 1.3 \times \left(\frac{100}{\sqrt{25}}\right)$

$= 546$



(3) A car belives that the percent of citizen in city ABC that owns a vehical is 60% (or) less. A sales Manger diagrees with this. He conducts hypothis testing Sorewing 250 residents & found the 170 residents responded yes to owing a vehical.

a) State the null & alternate hypothesis

b) At a 10% Significa value, is there enough evidence testing sorey 250 residens & found that 170.

① Delcare hypothesis

H_0 = If car owner ship is 60% (or) less than we accept H_0

H_1 = If car owner ship is not 60% (or) less than that we will reject the null hypothesis.

$\alpha = 10$. i.e $\boxed{\alpha = 0.1}$

Where

$\alpha = 1 - C.I$

$0.1 = 1 - C.I$

$C.I = 0.1 - 1$

$\boxed{C.I = 90\%}$

As we can see we have to use "proportion z-test"

$P_0 = 60\%$

$P_0 = 0.6$

$P_a + P_0 = 100$

$0.6 + x = 100$

$\boxed{x = 0.4}$

$\hat{P} = \frac{x}{n}$

$= \frac{170}{250}$

$\boxed{\hat{P} = 0.68}$

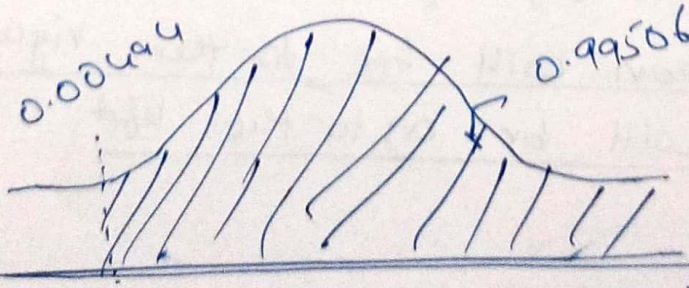
$$z = \frac{\hat{p} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

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

$\boxed{z = 2.5819}$

From z-table we caught $\boxed{z = 0.99506}$ $\approx 1 - 0.99506$

$= 0.00494$



As $0.99506 > 0.1$ we will accept the H_0

q④ What is the value of the 99 percentile.

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

① We have to sort the data in acending order

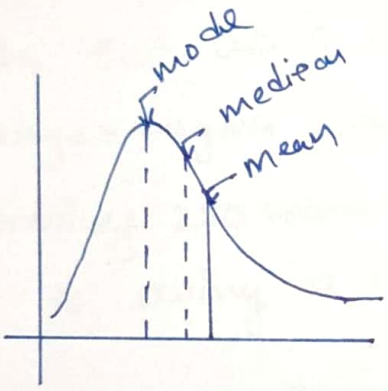
$$\text{Percentile rank} = \frac{\text{Percentile}}{100} \times (n+1)$$

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

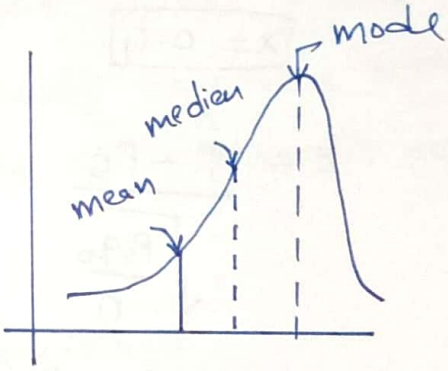
$$= 20.79.$$

So "12" will be having the 99th percentile.

q⑤



Right Skewd



left Skewd

Genrally in Right Skewd we can see the data having higher value will be low and data having lower value will be in ~~left~~ Right Side of the data because of the the mean will be to the right and median and mode will be on to the left.

unlike in the Right skewed, in left skewed the data having high value will be in the left side and data having the low value will be in the right side, because of these we can find out the mean to the left side and median and mode to left side