

Statistics Assig.

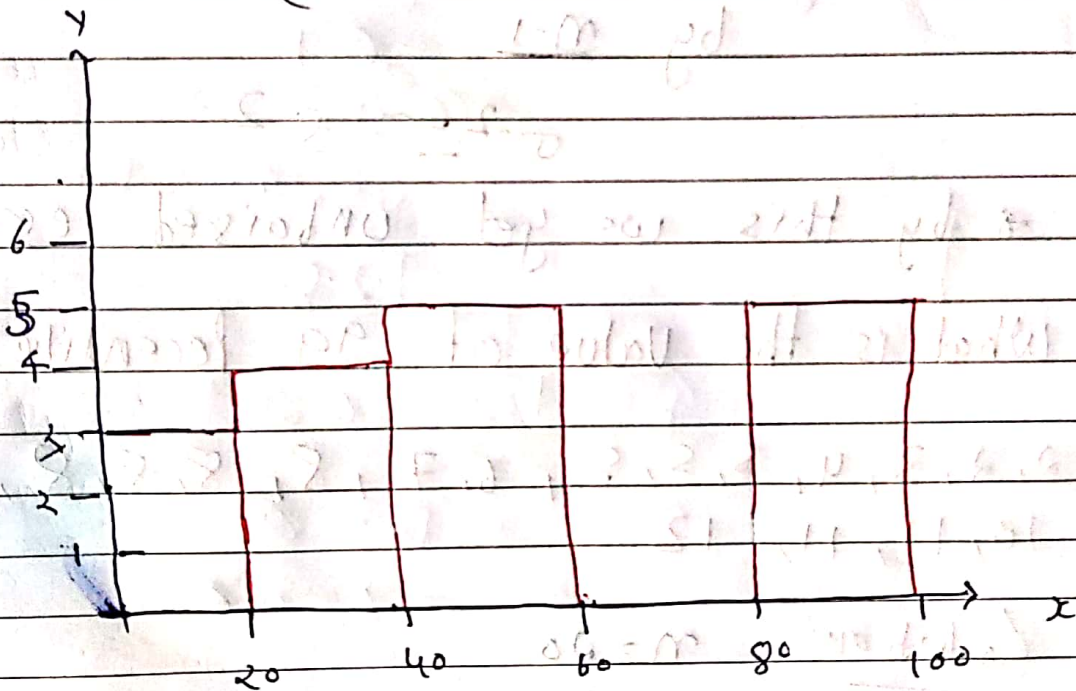
Q: Plot a histogram

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

Solution \Rightarrow Data set x lie b/w $\Rightarrow [0-100]$

Let bin = 5

(sub) bin size = $\frac{100}{5} = 20$



Note \rightarrow include 40 in interval 20 to 40

Q. In Sample Variance why $n-1$

$$s^2 = \frac{\sum_{i=1}^n (x_i - \bar{x})^2}{n-1}$$

Solution : If sample data is skewed then to make approximately similar to population data standard deviation we divide by $n-1$

$$\sigma^2 = s^2$$

* by this we get unbiased estimation

Q. 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

Solution $n=20$

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

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

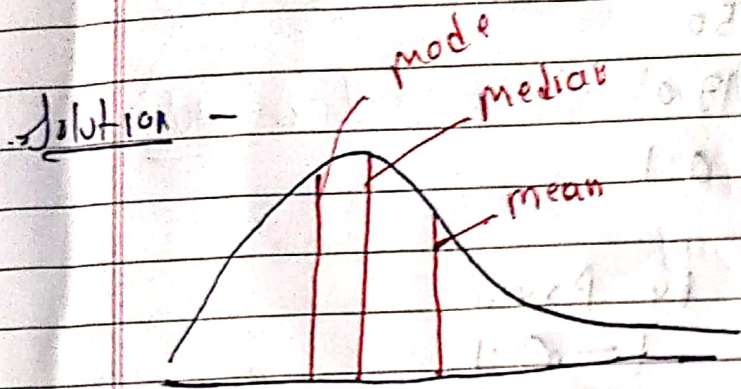
Therefore

$$= \frac{99}{5} = 19.8$$

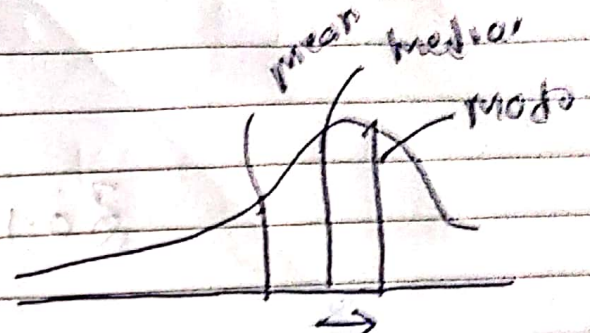
Index

$$\text{for value} = \frac{11 + 12}{2} = \boxed{11.5}$$

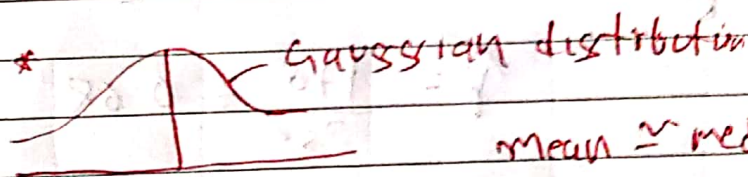
Q- In left & right skewed data what is the relation-
 ship b/w Mean median mode
 — Draw the Graph to Represent the same



Right Skewed data
 mean) median) mode



Left Skewed data
 mode) median) mean



mean \approx median \approx mode

- Q- A car company believes that the percentage of resident in city that owns a vehicle is 60% or less. A sales manager disagree with this. He conduct a hypothesis testing by surveying 250 resident & found that 170 responded yes to owning vehicle
- (i) state Null or Alternative Hypothesis
 - (ii) At 10% significance level, is there enough evidence to support the idea that vehicle ownership in ABC city 60% or less

Solve

$$H_0 \rightarrow P_0 \leq 60$$

$$H_1 \rightarrow P_0 > 60$$

1-tail test

$$n = 250$$

$$x = 170$$

$$\alpha = 0.1$$

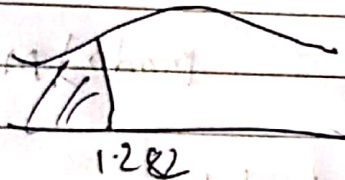
$$Z_{0.1} \Rightarrow \text{by Area}$$

$$1 - 0.1$$

$$= 0.9$$

using Z-table

$$1.28$$



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

$$q_0 = 1 - p_0 =$$

$$= 1 - 0.6 = 0.4$$

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

$$= \frac{0.08}{\sqrt{0.00096}}$$

$$= \frac{0.08}{0.30}$$

$$= 0.26$$

$$Z = 0.26$$

$$Z < 1.28 \Rightarrow$$

Reject Accept

null hypothesis

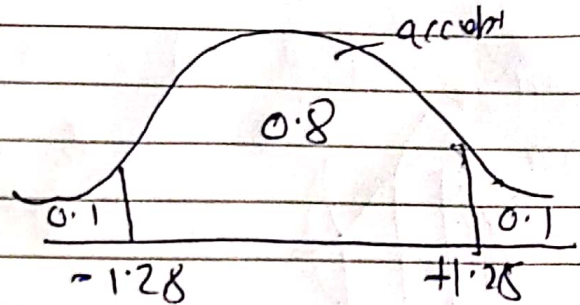
- Q: In Quant test of the CAT Exam, the population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct a 90% CI about the mean.

Soln. =

$$\sigma = 100$$

$$n = 25$$

$$\bar{x} = 520$$



$$\alpha = 1 - 0.8$$

$$= 0.2$$

$$\frac{3 \times 0.2}{2} \Rightarrow 3 \times 0.1 \Rightarrow 1.28 \quad \text{from } z \text{ table}$$

$$= 1 - 0.1 \Rightarrow 0.9$$

$$= 1.28$$

$$LF = \bar{x} - z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 - 1.28 \times \frac{100}{\sqrt{25}} = 494.4$$

$$HF = 520 + 25.6 = 545.6$$

