

1) Plot a histogram.

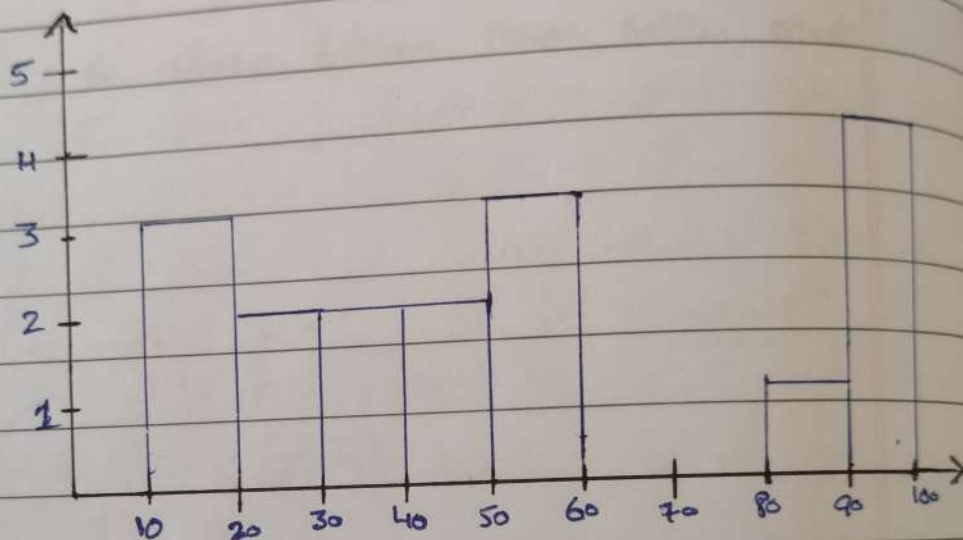
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

Bins \rightarrow Groups

Bin size \rightarrow Size of Bin

Bin $= 10$

Bin size $= \frac{100}{10} = 10$



Histogram

$n = 100$ $n = 25$ $\bar{x} = 520$ $CI = 80\%$

What is the value of the 99 Percentile?

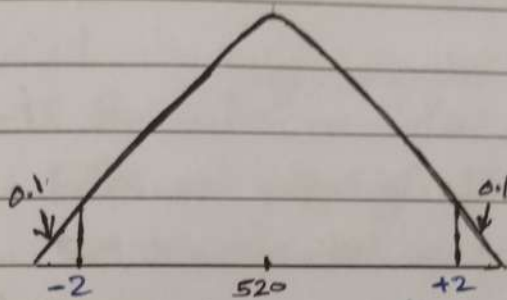
1) 2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 12

$\frac{\text{Percentile} \times n}{100}$

$$\frac{99}{100} \times 20 = 19.8$$

2) In a quant test of CAT Exam, the Population standard deviation is known to be 100. A sample of 25 tests taken has a mean of 520. Construct an 80% CI about the Mean.

$$\sigma = 100 \quad n = 25 \quad \bar{x} = 520 \quad C.I = 80\%$$



$$d = 1 - C.I$$

$$1 - 80 = 0.2 \quad d = 0.2$$

$$Z_{d/2} = Z_{\frac{0.2}{2}} = Z_{0.1}$$

$$Z_{\text{table } 0.1} = 2.33$$

$$\text{Lower fence} = \bar{x} - Z_{d/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 - 2.33 \left(\frac{100}{\sqrt{25}} \right)$$

$$= 516$$

$$\text{Higher fence} = \bar{x} + Z_{d/2} \frac{\sigma}{\sqrt{n}}$$

$$= 520 + 2.33 \left(\frac{100}{\sqrt{25}} \right)$$

$$= 524$$

3) A car manufacturing believes that the Percentage of citizens in city ABC that owns a Vehicle is 60% or less. A sample sales manager disagrees with this. He conducted a hypothesis testing survey of 250 residents & found that 170 residents answered Yes to owning a Vehicle.

- state the null & alternate hypothesis.
- At a 10% significance level, is there enough evidence to support the idea that Vehicle owners in ABC city is 60% or less

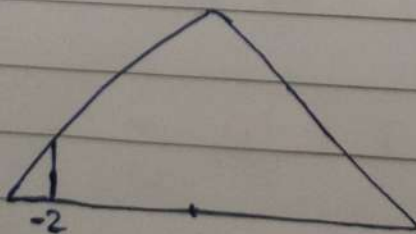
$$n = 250 \quad x = 170$$

$$\begin{array}{l} \text{Null Hypothesis } H_0: P_0 = 60\% \\ \text{Alternate Hypothesis } H_1: P_0 = 60\% \end{array}$$

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

$$P_0 = q_0 = 1 - P_0 \quad 1 - 0.6 = 0.4$$

$$d = 0.1 \quad \text{C.I } 1 - 0.1 = 0.9 \quad 90\%$$



$$Z_{\text{test}} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.4}{\sqrt{\frac{0.6 \times 0.4}{250}}} = \frac{0.28}{0.0349} = 11.563$$

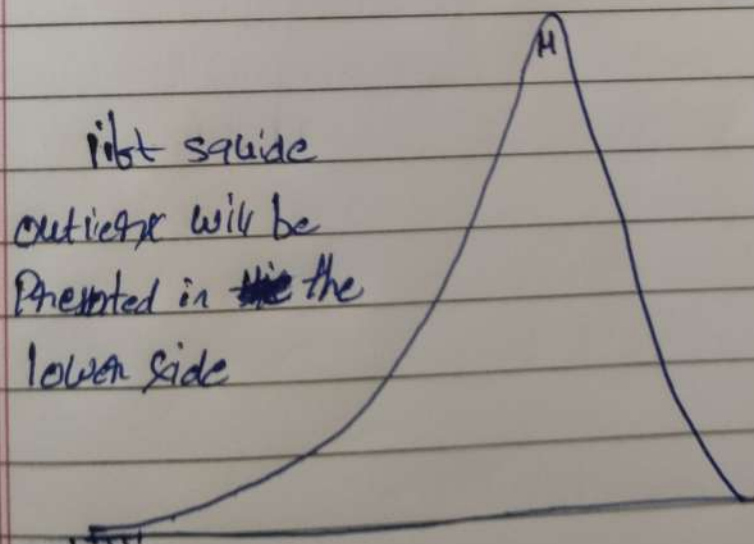
$-2 < 14.56$ Reject the Null Hypothesis

5) In left & Right-Skewed data, what is the relationship between mean, median & mode? Draw the graph to represent the same.



Right Skewed
outliers will be presented
in the higher side

Big numbers



Left Skewed
outliers will be
presented in the
lower side

Small numbers