

Que 1) Plot a histogram,

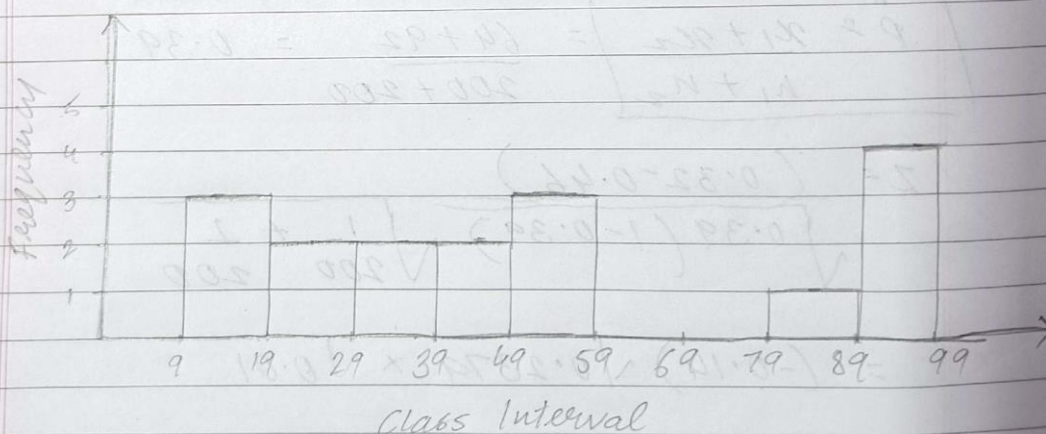
10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99

Statistics Assignments

Que 1) Plot a histogram for:
{10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56,
57, 88, 90, 92, 94, 99}

Creating class intervals and its related frequency:

CI	Freq.
0-9	-
10-19	3
20-29	2
30-39	2
40-49	2
50-59	3
60-69	-
70-79	-
80-89	1
90-99	4



Que 2) In a 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 an 80% CI about the mean.

Assignment Day 5:

- Q) In the quant test of CAT exam, the population standard deviation is 100. A sample of 25 candidates has a mean of 520. Construct a 80% confidence interval about the mean.

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

$CI = \text{Point estimate} \pm \text{margin of error}$

$$\bar{x} \pm Z_{\alpha/2} \frac{\sigma}{\sqrt{n}}$$

$$\alpha = 1 - 80\% = 1 - 0.80 = 0.20$$

$$Z_{\alpha/2} = Z_{\frac{0.20}{2}} = Z_{0.10} = 1.29$$

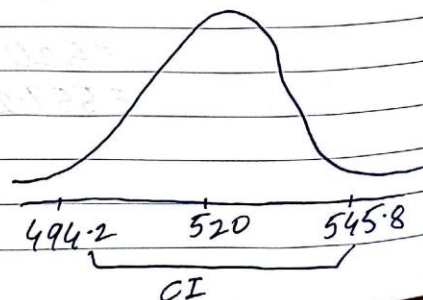
$$\text{Lower fence} = \bar{x} - Z_{\alpha/2} \frac{\sigma}{\sqrt{n}} = 520 - 1.29 \times \frac{100}{5}$$

$$= 520 - 1.29 \times 20 = \underline{\underline{494.2}}$$

$$\text{Higher fence} = \bar{x} + Z_{\alpha/2} \frac{\sigma}{\sqrt{n}} = 520 + 1.29 \times \frac{100}{5}$$

$$= \underline{\underline{545.8}}$$

→ 80% confidence interval ranges between 494.2 and 545.8



Que 3) A car manager believes 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.

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

Solⁿ
 Null Hypothesis : $H_0 : \mu \leq 60$
 Alternate Hypo : $H_1 : \mu \neq 60$

$$n = 250 \quad x = 170 \quad P_0 = 0.6 \text{ (60\%)}$$

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

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

$$\alpha = 0.1 \quad (\text{SI} = 10\%)$$

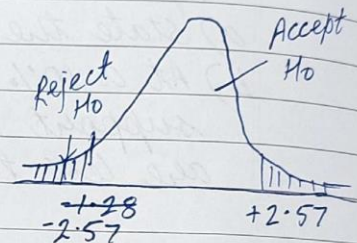
$$Z_{\alpha/2} = \cancel{+2.8} \quad Z_{0.05} = -2.57$$

$$\text{Z-test with proportion: } \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}}$$

$$= \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} \approx 2.58$$

As $2.58 > 2.57$, we reject the Null Hypo.

\therefore The vehicle owners are more than 60%.



Que 4) What is the value of the 99 percentile?

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

classmate
Date _____
Page _____

Que) 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 }

$$\text{Value} = \frac{\text{Percentile}}{100} \times (n+1)$$
$$= \frac{99}{100} \times (20+1)$$
$$= 20.79 \text{ (Index value)}$$

as $n = 20$, and the index value is 20.79, the answer would be 12

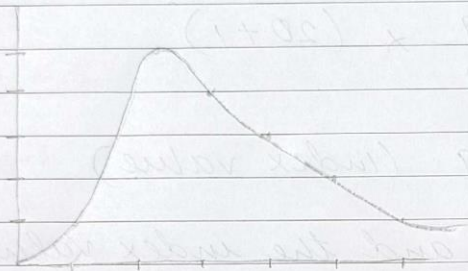
Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

Draw the graph to represent the same.

Que 5) In left & right-skewed data, what is the relationship between mean, median & mode?

Solⁿ $x = \{1, 2, 2, 2, 2, 2, 3, 3, 3, 3, 4, 4, 4, 5, 5, 6\}$

Plotting the graph:



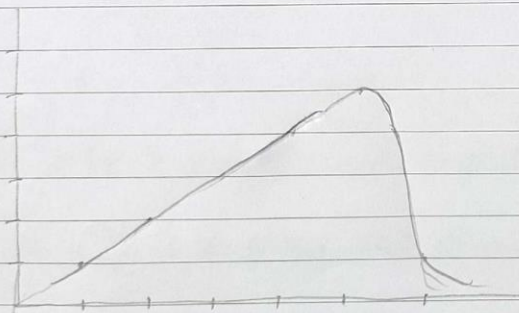
Mean = 3.18

Median = 3

Mode = 2

$y = \{6, 5, 5, 4, 4, 4, 3, 3, 3, 3, 2, 2, 2, 2, 2, 1\}$
 $1, 2, 2, 3, 3, 3, 4, 4, 4, 4, 5, 5, 5, 5, 5, 6\}$

Plotting the graph:



Mean = 3.81

Median = 4

Mode = 5

In right-skewed data : the mode is less than the median which is less than mean
In left-skewed data: the ~~mode~~ mean is less than the median which is less than mode.

