Statistics Assignment

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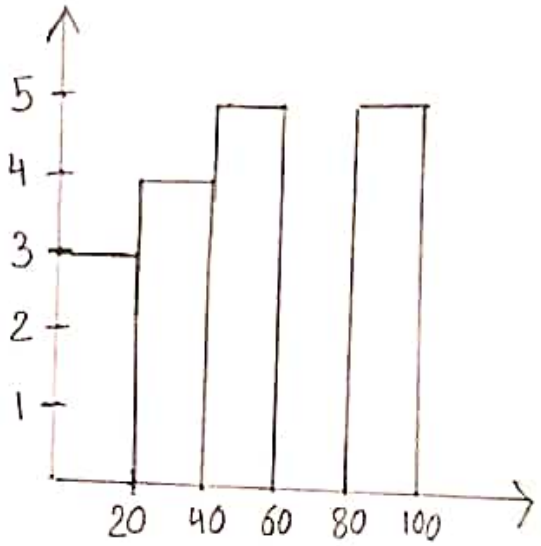
Batch: Full stack data analytics

Ans 1. Distribution = {10, 13, 18, 22, 27, 32, 38, 40, 45, 51, 56, 57, 88, 90, 92, 94, 99}

No. of bins = 5

Bin size = 20

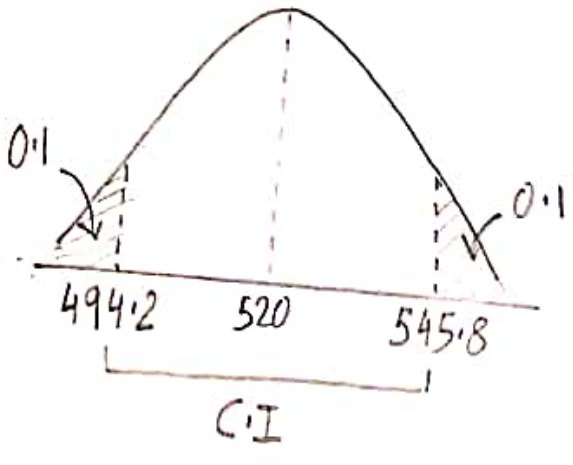


Ans 2. Given values,

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

Now,

Significance value, $\alpha = 1 - C.I = 1 - 0.80 = 0.20$



Confidence interval

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

$= 520 - Z_{0.1} \frac{100}{\sqrt{25}}$

$= 520 - (1.29 \times 20)$

$= 494.2$

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

$= 520 + (1.29 \times 20)$

$= 545.8$

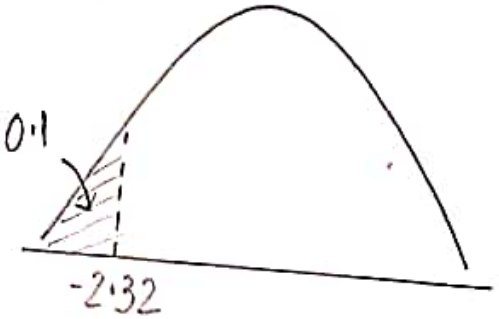
Ans 3. a) Null hypothesis, $H_0 : P_0 >= 60\%$

Alternate hypothesis, $H_1 : P_0 < 60\%$

b) $\alpha = 0.1$

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

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



Z-test with proportion :-

$$\text{Z-test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 q_0}{n}}} = \frac{0.68 - 0.60}{\sqrt{\frac{0.60 \times 0.4}{250}}} = \frac{0.08}{0.0309} = 2.58$$

$\because 2.58 > -2.32$ we accept the null hypothesis.

$\therefore$ Vehicle ownership is greater than 60% in city ABC.

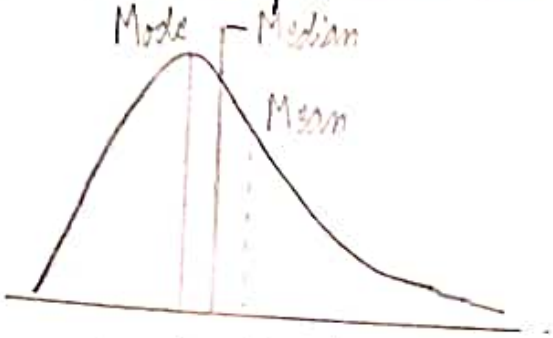
Ans 4. Data set = 2, 2, 3, 4, 5, 5, 5, 6, 7, 8, 8, 8, 8, 8, 9, 9, 10, 11, 11, 12

Index Value of 99 percentile = $\frac{99}{100} \times (20+1)$

$= 20.79$ Index

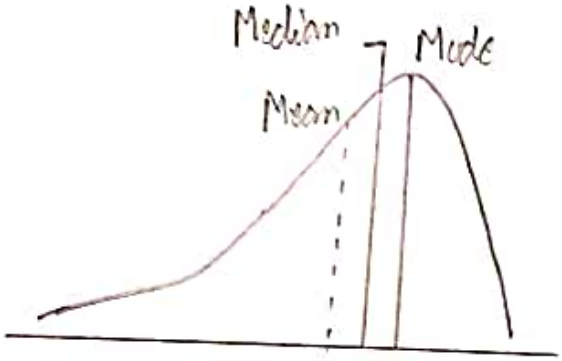
$\therefore$ Value = 12

Ans 5. Relationship between mean, median and mode



Mean > Median > Mode

Right skewed



Mode > Median > Mean

Left skewed