Statistics Assignment

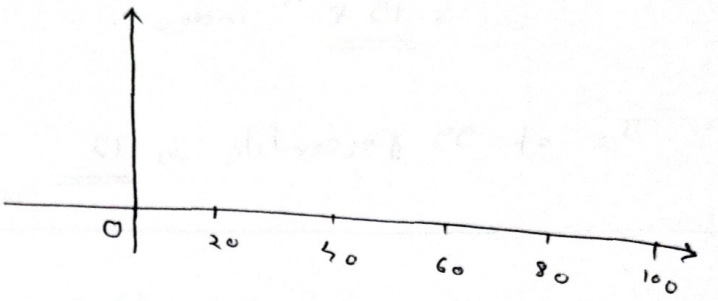
Q1) Plot a histogram,

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

Solution

bin = 5

bin size = 20



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2)

Sol^n $\Rightarrow$ $\bar{x} = 520$, S.D = 100, C.I = 95% $\alpha = 0.05$, $n = 25$

$\Rightarrow$ $\bar{x} \pm t_{\alpha/2} \left(\frac{S.D}{\sqrt{n}}\right)$

① Degree of freedom = $n - 1 = 25 - 1 = 24$

② $t_{\alpha/2} = t_{0.05/2} = t_{0.025}$

③ Lower fence = $520 - 1.964 \times \left(\frac{100}{\sqrt{25}}\right) = 520 - 1.964\left(\frac{20}{\frac{100}{5}}\right)$

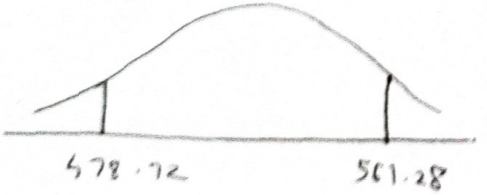
$= 520 - 41.28$

$= 478.72$

④ Higher fence = $520 + 1.964 \times \left(\frac{100}{5}\right)$

$= 520 + 41.28$

$= 561.28$



Q3

Solution

null hypothesis

$H_0: P_0 = 60\%$

$H_1: P_0 \neq 60\%$

$n = 250, \quad x = 170$

$\hat{P} = \frac{x}{n} = \frac{179}{250} = 0.68$

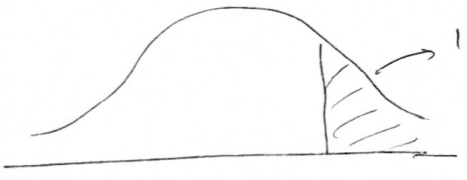
$q_0 = 1 - P_0 = 1 - 0.6 = 0.4$

$\alpha = 0.05$

Z-test with proportion

$$z \text{ test} = \frac{\hat{P} - P_0}{\sqrt{\frac{P_0 \cdot q_0}{n}}} = \frac{0.68 - 0.6}{\sqrt{\frac{0.6 \times 0.4}{250}}} = 2.581$$

$2.581 > 1.96 \rightarrow$ accept the null hypothesis



$1 - 0.93922 = 0.06178$

$P_{value} = 0.06178$

P-value > significance value → Accept the null hy

$0.06 > 0.05$

Q4) 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

Solution

$$\text{Value} = \frac{\text{Percentile}}{100} * (n+1)$$

$$= \frac{99}{100} \times (20+1)$$

$$= 0.99 \times 20$$

$$= 19.8^{th} \text{ index}$$

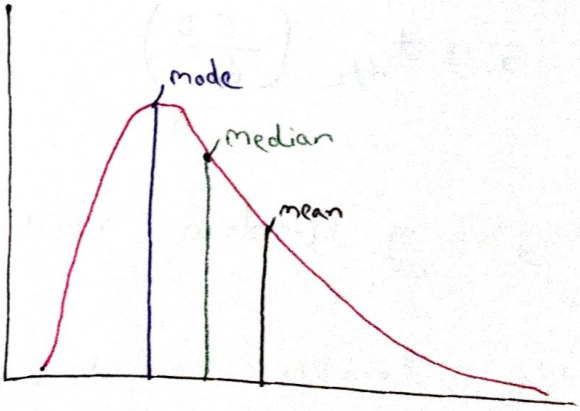
∴ The of 99 percentile is 12

Q5)

Solution :- » A Left-skewed distribution has a long left tail.

» A Right-skewed distribution has a long right tail.

Left-skewed



Right-skewed.