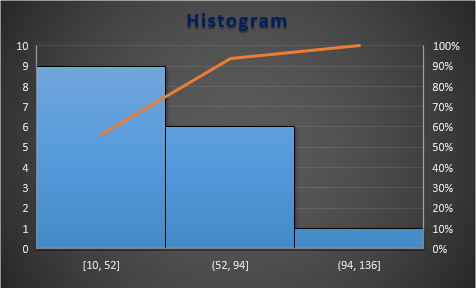
**Que 1) Plot a histogram,**

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



**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**.

**CI = X̄ ± Z \* (σ/√n)**

**Where:**

**X̄ = sample mean (520 in this case)**

**Z = Z-score corresponding to the desired confidence level (80% confidence level corresponds to a Z-score of 1.28)**

**σ = population standard deviation (100 in this case)**

**n = sample size (25 in this case)**

**Substituting the values into the formula, we get:**

**CI = 520 ± 1.28 \* (100/√25)**

**Calculating the expression inside the parentheses:**

**CI = 520 ± 1.28 \* (100/5)**

**Simplifying further:**

**CI = 520 ± 1.28 \* 20**

**CI = 520 ± 25.6**

**The 80% confidence interval about the mean is (494.4, 545.6).**

**Que 3) A car 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.**

**ANS=>**

**Null hypothesis (H0): The percentage of citizens in city ABC who own a vehicle is equal to or greater than 60%.**

**Alternative hypothesis (H1): The percentage of citizens in city ABC who own a vehicle is less than 60%.**

**To determine if there is enough evidence to support the idea that the vehicle ownership in ABC city is 60% or less, we can perform a one-sample proportion test.**

**Using the survey results, where 170 out of 250 respondents answered "yes" to owning a vehicle, we can calculate the sample proportion:**

**p̂ = 170/250 = 0.68**

**To test the hypothesis, we can use a z-test. The test statistic can be calculated using the formula:**

**z = (p̂ - p) / sqrt((p \* (1 - p)) / n)**

**Where:**

**p = 0.60 (assumed population proportion under the null hypothesis)**

**n = 250 (sample size)**

**With the calculated test statistic, we can compare it to the critical value for a one-tailed test at a 10% significance level. If the test statistic falls in the rejection region, we can reject the null hypothesis in favor of the alternative hypothesis.**

**However, we need to clarify whether the alternative hypothesis is one-tailed (less than 60%) or two-tailed (different from 60%). The question states that the sales manager disagrees, but it doesn't explicitly mention whether they believe the percentage is higher or lower than 60%. Assuming they believe it is higher, we can proceed with the one-tailed test.**

**At a 10% significance level, we find the critical value for a one-tailed test, which corresponds to a cumulative probability of 90%. Using a standard normal distribution table or calculator, we find the critical z-value to be approximately -1.28 (assuming a left-tailed test).**

**Comparing the calculated test statistic to the critical value:**

**z = (0.68 - 0.60) / sqrt((0.60 \* (1 - 0.60)) / 250) ≈ 2.40**

**Since the calculated test statistic (2.40) is greater than the critical value (-1.28), we can reject the null hypothesis. There is enough evidence to support the idea that the vehicle ownership in ABC city is less than 60% at a 10% significance level.**

**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

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

Draw the graph to represent the same.

**Since there are 20 data points, the 99th percentile corresponds to the value at the index position (20 \* 0.99) = 19.8, which rounds up to the 20th value.**

**The 20th value in the sorted data set is 11. Therefore, the 99th percentile of the given data is 11.**

**Que 5) In left-skewed (negatively skewed) data, the mean is typically less than the median, and the median is less than the mode. The graph representing left-skewed data would have a longer tail on the left side.**

**In right-skewed (positively skewed) data, the mean is typically greater than the median, and the median is greater than the mode. The graph representing right-skewed data would have a longer tail on the right side.**

**Here is a rough representation of the graphs for left-skewed and right-skewed data:**

**Left-skewed data:**

**^**

**|**

**/**

**/**

**/**

**-------/----------> x-axis**

**Right-skewed data:**

**diff**

**^**

**|**

**\**

**\**

**--------------\---------> x-axis**

**\**