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1. Two branches of a courier service record the delivery times (in minutes) of 12 parcels.

Branch 1: 22, 24, 25, 26, 30, 32, 33, 33, 34, 36, 37, 38
Branch 2: 18, 20, 22, 27, 29, 33, 35, 38, 42, 50, 55, 60

a) Find the 4th Decile for Branch-1 and the 78th percentile for Branch-2.
b) Draw box-and-whisker plots for both data sets on the same number line.
c) Calculate the sample standard deviation, and coefficient of variation (CV) for each branch. Which branch has more variability in scores? Which branch has more Stability?
d) Compute the skewness coefficient and kurtosis coefficient for each branch. What does the values imply about the shape of the distributions? (N.B., Branch 1: $\mu_2 = 29.92$, $\mu_3 = -14.01$, $\mu_4 = 1{,}761.47$; Branch 2: $\mu_2 = 181.33$, $\mu_3 = 1{,}167.19$, $\mu_4 = 169{,}981.17$)

2. A startup records the daily number of app downloads for two competing mobile apps over 14 days.

App A: 40, 42, 45, 50, 50, 52, 55, 58, 60, 62, 65, 65, 68, 70
App B: 14, 17, 20, 25, 28, 32, 35, 40, 45, 52, 58, 65, 72, 85

a) Find the 6th Decile for App-A and the 88th percentile for App-B.
b) Draw box-and-whisker plots for both data sets on the same number line.
c) Calculate the sample standard deviation, and coefficient of variation (CV) for each App. Which App has more variability in scores? Which App has more Stability?
d) Compute the skewness coefficient and kurtosis coefficient for each App. What does the values imply about the shape of the distributions? (N.B., App A: $\mu \approx 89.80$, $\mu \approx -41.63$, $\mu \approx 20{,}837$; App B: $\mu \approx 454.41$, $\mu \approx 5{,}013.90$, $\mu \approx 1{,}021{,}911$)

3. A nutritionist is studying how a new diet plan affects adults' daily water intake. There are 80 adults following this diet plan. From this group, a sample of 6 adults was selected randomly to monitor their daily water intake (in liters) for one week. The recorded daily water intake for three of these participants on a specific day are 1.8, 2.2, and 1.5 liters.

(**During the study, some participants occasionally forgot to log their water intake or estimated the amount they drank instead of measuring precisely, which could affect the accuracy of the data collected. **)

a) Identify the sampling method used in this study. Is there any type of error in the sampling process?

b) Identify the appropriate level of measurement of the data in this study. Suggest three possible analyses that can be performed for the observed data.

4. A faculty member is studying deep focus behavior among final-year Software Engineering students. The data below shows the number of uninterrupted minutes spent in a single deep work session by 30 students:

8	25	11	15	29	22	10	5	17	21
22	13	26	16	18	12	9	26	20	16
23	14	19	23	20	16	27	16	21	14

a) Create a frequency distribution table after grouping the data using appropriate method.

b) Calculate the percentage of students who spent 20 to 60 minutes in a single session.

c) Calculate the Median and Mode of the frequency distribution created in (a).

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5. The following distribution represents the income (in Tk) of a mobile repairing shop in different days.

Class Interval of Income	10-12	12-14	14-16	16-18	18-20	Total
No. of Days (f)	3	8	14	18	7	50

a) Create a frequency distribution table with cumulative, relative, and cumulative relative frequencies.

b) What percentage of days the interval of income remains between 14 to 18 (in Tk)?

c) Calculate the median and mode from the frequency distribution table.

6. A meteorologist is studying the daily average temperatures recorded in degrees Celsius over 100 consecutive days in a small town. The meteorologist selects 5 days from the 100-day period to analyze temperature trends in detail. The recorded temperatures (in °C) for these 5 days are: 22, 25, 21, 23, and 24.

a) Identify the sampling method used in this study. Is there any type of error in the sampling process?

b) Identify the appropriate level of measurement of the data in this study. Suggest three possible analyses that can be performed on the observed data.

7. The researcher surveyed 30 people about their favorite type of fruit. The responses were:

Apple, Banana, Orange, Apple, Banana, Apple, Orange, Apple, Banana, Banana, Orange, Apple, Banana, Apple, Orange, Apple, Banana, Orange, Banana, Apple, Orange, Banana, Apple, Banana, Orange, Apple, Banana, Orange, Apple, Banana.

a) Create a frequency distribution table with cumulative, relative, and cumulative relative frequencies.

b) Construct an appropriate graphical representation of the above dataset.

c) Calculate the percentage of people whose favorite fruit is Apple.

8. Thirty adults were asked which of the following conveniences they would find most difficult to do without: television (T), refrigerator (R), air conditioning (A), public transportation (P), or microwave (M). Their responses are listed below.

R	A	R	P	P	T	R	M	P	A
A	R	R	T	P	P	T	R	A	A
R	P	A	T	R	P	R	A	P	R

a. Prepare a frequency distribution table.
b. Calculate the relative frequencies and percentages for all categories.
c. What percentage of these adults named refrigerator or air conditioning as the convenience that they would find most difficult to do without?
d. Draw a bar graph for the relative frequency distribution.