
Date	Sep-21-2024	Session No	2
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Topic : Statistics in BI and Data Analytics

Assignment Questions to try

Question 1: Basic Mean, Median, Deviation, and Standard Deviation

You are given the following list of daily temperatures (in °C) recorded over the past 10 days:

temperatures = [30, 32, 29, 35, 28, 34, 31, 33, 29, 30]

Tasks:

1. Write a function to calculate the mean and median of these temperatures.
2. Calculate the deviation of each temperature from the mean.
3. Find the variance and standard deviation for this dataset.
4. Calculate the coefficient of variation for these temperatures.

Question 2: Weighted Mean and Basic Statistics

The following list shows the scores of 5 students in a test, along with the number of assignments they completed (as weights):

scores = [85, 90, 78, 92, 88] weights = [3, 4, 2, 5, 4]

Tasks:

1. Calculate the weighted mean of the test scores based on the weights (assignment counts).
2. Find the mean and median of the scores.
3. Calculate the variance and standard deviation of the scores.
4. Determine the coefficient of variation for these scores.

Question 3: Median and Statistical Measures

Consider the following data representing the number of minutes spent on different activities in a day by 8 individuals:

activity_times = [120, 150, 100, 130, 110, 140, 160, 135]

Tasks:

1. Write a function to compute the **mean** and **median** of the activity times.
2. Calculate the **deviation** of each activity time from the mean.
3. Find the **variance** and **standard deviation** for the activity times.
4. Calculate the **coefficient of variation** for the dataset.

Question 4: Mean, Weighted Mean, and Variance for Exam Scores

A class of students scored the following marks in two different subjects. The first subject has a weight of 0.6, and the second subject has a weight of 0.4:

Subject 1 Scores:

subject1 = [75, 80, 78, 90, 85, 88]

Subject 2 Scores:

subject2 = [82, 78, 85, 91, 80, 86]

Tasks:

1. Compute the **mean** and **median** for each subject's scores.
2. Calculate the **weighted mean** of the combined scores, using the provided weights.
3. Find the **variance** and **standard deviation** for both subjects' scores.
4. Calculate the **coefficient of variation** for both subjects' scores.

Question 5: Median and Coefficient of Variation in Sales Data

You are given the weekly sales data (in thousands of dollars) of a small store over 8 weeks:

sales = [55, 60, 58, 62, 59, 57, 61, 63]

Tasks:

1. Write a function to calculate the **mean** and **median** of the weekly sales.
2. Calculate the **deviation** of each week's sales from the mean.
3. Compute the **variance** and **standard deviation** for the sales data.
4. Find the **coefficient of variation** of the weekly sales.

Question 6: Weighted Mean and Deviation for Grades

A student's final grade is determined based on the following breakdown: Assignments (40%), Quizzes (20%), and Exams (40%). Their scores are as follows:

Assignment Scores:

assignments = [85, 87, 90]

Quiz Scores:

quizzes = [78, 85]

Exam Scores:

exams = [92, 88]

Tasks:

1. Calculate the **weighted mean** for the final grade, using the provided weight breakdown.
2. Find the **mean** and **median** for each of the three categories (Assignments, Quizzes, and Exams).
3. Compute the **variance** and **standard deviation** for each category of scores.
4. Determine the **coefficient of variation** for each category.

Hints / Formulas :

1. Mean Calculation:

$$\text{Mean} = \frac{\sum \text{values}}{n}$$

2. Weighted Mean:

$$\text{Weighted Mean} = \frac{\sum w_i \cdot x_i}{\sum w_i}$$

Where w_i are the weights and x_i are the values.

3. **Median:** Sort the data. If odd, take the middle value; if even, take the average of the two middle values.4. **Deviation:**

$$\text{Deviation} = x_i - \mu$$

Where x_i is each value, and μ is the mean.

5. **Variance:**

$$\text{Variance}(\sigma^2) = \frac{\sum (x_i - \mu)^2}{n}$$

6. **Standard Deviation:**

$$\sigma = \sqrt{\text{Variance}}$$

7. **Coefficient of Variation:**

$$\text{CV} = \frac{\sigma}{\mu}$$

END