DETERMINE MEASURE OF CENTRAL TENDENCY OF UNGROUPED DATA

Welcome to our exciting journey into the world of data analysis! In this main course, we'll be diving deep into understanding measures of central tendency for ungrouped data. Get ready to explore the heart of statistics as we uncover the secrets behind finding the mode, median, and mean. Throughout our adventure, we'll tackle real-life scenarios and learn how to apply these concepts in practical situations. So, grab your calculators and let's embark on this thrilling statistical voyage together!

Learning Objectives:
At the end of this module, students will be able to:

1. give the definitions of mean, median, and mode in the context of measures of central tendency for ungrouped data;
2. explain the steps in finding the mean, median, and mode for ungrouped data; and
3. recognize the significance of understanding measure of central tendency in solving math problems.

Measures of Central Tendency

Understanding the measures of central tendency for ungrouped data is fundamental in statistics, allowing us to summarize and interpret data sets effectively.

Mean

- The mean is the sum of all the values in a data set divided by the number of values. It is often referred to as the "average" of a data set.
- It is calculated by summing up all the values and dividing by the total number of observations.

$$\bar{x} = \frac{\Sigma x}{n}$$

where $\bar{x}$ is the **mean**, Σx is the **sum of all the values,** and **n** is the **total number of values.**

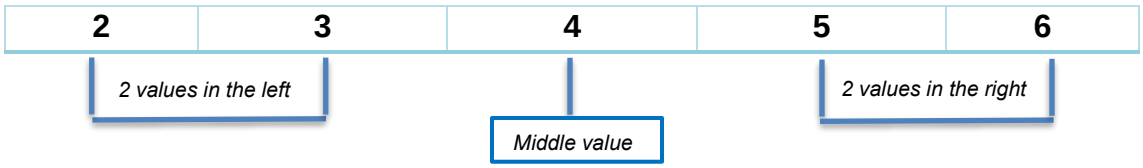
For example, if we have scores of 2,3,4,5,6.
The mean will be: (2+3+4+4+5+6)/6 = 24/6 =4

Median

- The median is the middle value when a data set is arranged in order from least to greatest.
- Note that if there are two middle values, the median is the mean of those two values.

Example 1:
If we have scores of **6,3,4,5,2**

Arrange it to least to greatest:



Since the data is already in the order of least to greatest, we will just determine the middle value. In this case, **4.**

Example 2:
If we have scores of **2,3,4,5,7,6**
Since the data is already in the order of least to greatest, we will just determine the middle value.
However, in this case there are 2 middle scores which is 4 and 5. Hence, we will add it together then divide by 2 which would be equal to 4.5.

5+ 4= 9
9/2 = 4.5

Mode

- The mode is the value that appears most frequently in a data set.
- A data set can have more than one mode or no mode at all.

Example 1:
If we have scores of **2,3,4,4,5,6.**
The mode will be **4**, since it is the value that was repeated twice.

Example 2:
If we have scores of **2,3,3,4,4,5,5,5,6,6,6.**
The mode will be **5 and 6,** since these are the values that appear most frequently in the set (appearing thrice).

Significance of understanding measure of central tendency

Understanding measures of central tendency is crucial in solving math problems because they provide valuable insights into the data's typical or average value, aiding in making informed decisions and predictions.

Budgeting
Knowing the mean household income helps families plan their budgets effectively, ensuring they allocate resources appropriately for expenses such as groceries, bills, and savings. For instance, if the mean income is $50,000 per year, families can use this information to allocate a portion of their budget to different categories, ensuring financial stability.

Exam Scores

Understanding the median score in a class helps teachers assess student performance fairly and identify areas that need improvement. For example, if the median score on a math test is 80%, it indicates that half of the students scored above and half below this value, allowing teachers to tailor their teaching strategies to address common misconceptions and reinforce key concepts.

Sports Statistics

Analyzing the mode of scores or times in sports competitions helps coaches identify the most frequent performance level of athletes, guiding training plans and strategy adjustments. For instance, in track and field, if the mode time for a race is 10.5 seconds, coaches can focus training on improving athletes' speed and technique to achieve or surpass this benchmark, aiming for better overall performance in competitions.