



Unit 5: One and Two Variable data analysis

Lesson 5.4: Measures of Central Tendency

Learning Goal: Analyze and describe data using measure of central tendency.

Measures of central tendency are methods of determining values around which data tend to cluster.

Mean (Average): is the _____ of the values in a set of data _____ by the number of values in the set.

- There are two types of means: a population mean and a sample mean. A sample mean will approximate the actual mean of the population
- Greek letter “mu”, μ , represents a population mean, and \bar{x} , read as “x-bar” represents a sample mean.
- For **UNGROUPED data**:

$\mu =$ _____ , where N = # of values in the population

$\bar{x} =$ _____ , where n = # of values in the sample

- For **GROUPED data** (or data that falls within intervals):

_____ , where m_i is the midpoint of the interval and f_i is the frequency for that interval

- For a **WEIGHTED mean** that reflects the greater significance of certain data

Median: is the middle value when values are _____ from highest to lowest.

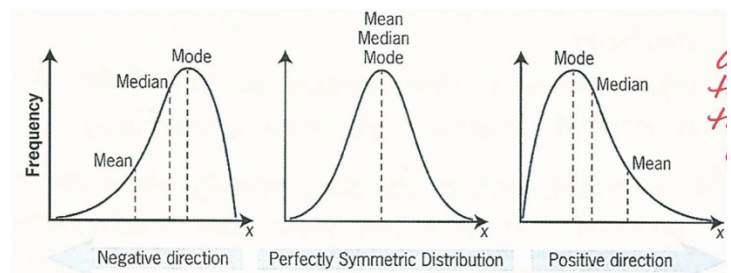
- If there are an even number of data, then the median is the average of the two middle values.

Mode: is the value which occurs _____ in a set of data.

- Some distributions have more than one mode, and others have no mode at all.

Outliers: are values that are significantly distant from the majority of the data that skew the distribution.

- Has a minimal effect on the median, but a great effect on the mean, particularly for a small sample



Left skewed (mean towards left)

Right skewed



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Task 1: Below are two class sets of marks

Class A	71	82	55	76	66	71	90	84	95	64	71	70	83	45	73	51	68	
Class B	54	80	12	61	73	69	92	81	80	61	75	74	15	44	91	63	50	84

- a) Calculation: determine the mean, median and mode for each class.
- b) Analysis: use the measures of central tendency to compare the performance of the two classes.
- c) Analysis: what is the effect of any outliers on the mean and the median?



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Task 2: The personnel manager for Canadian Tire considers five criteria when interviewing a job applicant. She scores each category between 1 and 5, with 5 as a high score. Each category has a weighting between 1 and 3.

Criterion	Applicant score	Weight Factor
Education	4	2
Job experience	2	2
Interpersonal skills	5	3
Communication	5	3
References	4	1

- Calculation: Determine the weighted mean score for this job applicant.
- Calculation: How does this weighted mean differ from the un-weighted mean?
- Analysis: what do the weighted factors indicate about the company's hiring priorities?



Task 3: A group of children were asked how many hours a day they spend watching television.

- a) Calculation: Determine the mean and median number of hours for this distribution.

First, find the midpoints and cumulative frequencies for the intervals. Then, use the midpoints and the frequencies for the intervals to calculate an estimate for the mean.

Hours watching TV	Frequency, f_i
0 – 1 (left closed, right opened)	1
1 – 2	4
2 – 3	7
3 – 4	3
4 – 5	2
5 – 6	1

# hours	Midpoint m_i	Frequency f_i	Cumulative frequency	$f_i m_i$
		$\sum_i f_i =$		$\sum_i f_i m_i =$

- b) Analysis: Why are these values simply approximations?