

AS1 (Assignment 1, Unit 2): Central Tendency and Shapes of Distributions

1. What is the goal of central tendency?

The goal of central tendency is to get the average from the given data, and as to get the one single measure as representative from a set of data. As to find the middle of a distribution.

2. Find the mean, median, and mode for the following sample of scores: 5, 4, 5, 2, 7, 1, 3, 5

Mean 4 Median 4.5 Mode 5

3. Find the mean, median, and mode for the following sample of scores: 3, 5, 7, 3, 9, 8, 3, 7, 5

Mean 25 Median 5 Mode 3

4. Find the mean, median, and mode for the scores in the following frequency table.

<u>X</u>	<u>f</u>	
6	1	Mean <u>2.78</u> Median <u>3</u> Mode <u>1</u>
5	2	
4	2	
3	2	
2	2	
1	5	

5. Find the mean, median, and mode for the scores in the following frequency table.

<u>X</u>	<u>f</u>	
8	1	Mean <u>5.07</u> Median <u>5</u> Mode <u>5</u>
7	1	
6	2	
5	5	
4	2	
3	2	

6. Explain why the median is often preferred to the mean as a measure of central tendency for a skewed distribution?

Skewed distribution very often has the outlier that can impact the mean, as mean is being pulling toward the outlier (either to the right or left side of the distribution) that it will be further far away to be representative from the data, that it is not usually in the middle of the distribution

7. A researcher conducts a study comparing two different treatments with a sample of participants divided into 2 treatments. The study produced the following data:

Treatment 1: 6, 7, 11, 4, 19, 17, 2, 5, 9, 13, 6, 23, 11, 4, 6

Treatment 2: 10, 9, 6, 6, 1, 11, 8, 6, 3, 2, 11, 1, 12, 7, 10

Calculate mean for treatment 1 and put your answer here _____ 9.53 _____

Calculate mean treat treatment 2 and put your answer here _____ 6.86 _____

Calculate the median for treatment 1 and put your answer here _____ 7 _____

Calculate the median for treatment 2 and put your answer here _____ 7 _____

Calculate the mode for treatment 1 and put your answer here _____ 6 _____

Calculate the mode for treatment 2 and put your answer here _____ 6 _____

8. Schmidt (1994) conducted a series of experiments examining the effects of humor on memory. In one study, participants were shown a list of sentences of which half were humorous and half were non-humorous. Schmidt then measured the number of each type of sentence recalled by each participant. The following scores are similar to the results obtained in the study:

Humorous	Non-humorous
4 5 2 4	5 2 4 2
6 6 6 6	2 3 1 6
2 5 4 3	3 2 3 3
1 3 5 5	4 1 5 3

Mean for humorous group: _____ 4.18 _____

Mean for non-humorous group: _____ 3.06 _____

Do the data suggest that humor helps memory? Answer "yes" or "no" and why:

Yes, the mean is higher from the humorous groups than non-humorous group, it suggest that humor helps memory.

9. A researcher measured the time that a sample of students selected from Caldwell University spent studying on a given week during a semester. Here are the data in hours:

4, 6, 5, 4, 5, 7, 8, 6, 5, 7, 8, 9, 9, 1, 0, 2, 3, 5, 6, 4, 3, 7, 8, 4, 5, 6, 7, 8, 7, 6, 21, 7, 8, 9, 2, 3, 2

ANSWER the following questions based on the information given in question #9

Name the population: Students spent studying on a given week during semester from Caldwell university

Name the sample: the selected 37 students from Caldwell university

How many participants are in the sample? 37

What is the scale of measurement? ratio

Is the scale continuous or discrete? continuous

9a. Use SPSS to compute the following (using the data from question 9):

- generate a frequency table
- the appropriate graph
- mean
- median
- mode

PASTE your SPSS results here:

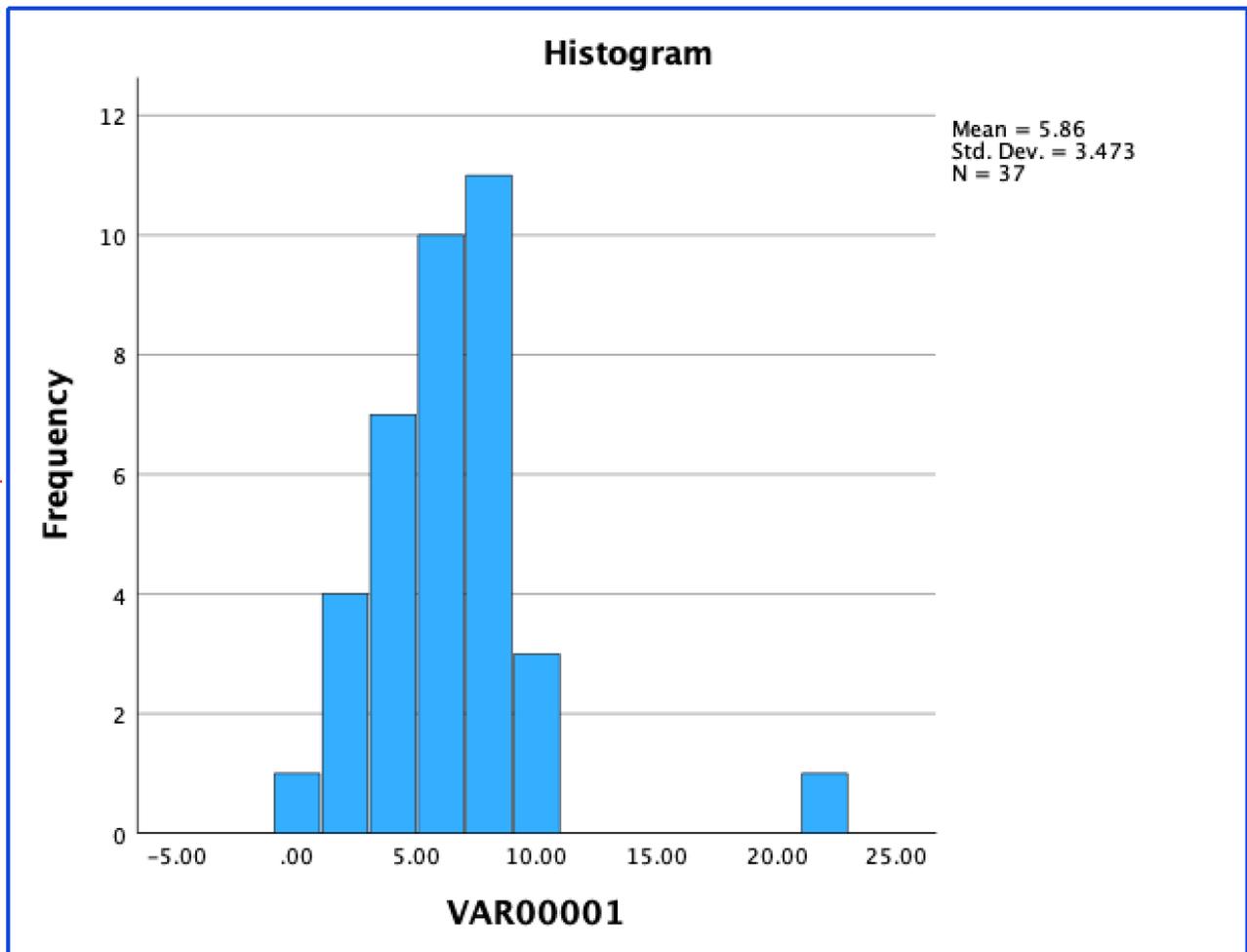
Statistics

VAR00001

N	Valid	37
	Missing	0
Mean		5.8649
Median		6.0000
Mode		7.00
Std. Deviation		3.47341

VAR00001

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	.00	1	2.7	2.7	2.7
	1.00	1	2.7	2.7	5.4
	2.00	3	8.1	8.1	13.5
	3.00	3	8.1	8.1	21.6
	4.00	4	10.8	10.8	32.4
	5.00	5	13.5	13.5	45.9
	6.00	5	13.5	13.5	59.5
	7.00	6	16.2	16.2	75.7
	8.00	5	13.5	13.5	89.2
	9.00	3	8.1	8.1	97.3
	21.00	1	2.7	2.7	100.0
Total		37	100.0	100.0	



Based on your SPSS results, please answer the following questions:

What is the mean? 5.86 What is the mode? 7 What is the median? 6

What is the shape of this distribution? Answer= positively skewed distribution

Which is the “best” measure of central tendency for these data? Median

Why?

When there is an outlier, which will effect the mean and the mode that distorted the middle point (the average) of the data, while median as the measure of central tendency is the best representative as the average of the data.

Going on to a different set of questions, which have nothing to do with any of the above questions:

10. Why are there three measures of central tendency rather than just one?

Mean can be impacted by the outliers, furthermore, there are different types of data set, while some type of data can be suitable with a certain way of measure of central tendency. Such as Nominal data set as non numeric that cannot be computed into mean, while the mode as the appropriate measure.

11. Name a situation where the mean would NOT be an appropriate measure of central tendency. Do not use an example from class lecture

If the data set is nominal, or there is outliers. Data set is names/ categories that has no number or there is only exceptional few data that far away from the rest of the data scores. Examples: when wanting to know which tea favors sold the most from a grocery, or when getting the average of this semester students scores from unit 1 exam, that there is only one student score 20 and the rest of the students scores above 70.

12. Name a situation where only the mode could be used as a measure of central tendency

when collecting data as what is the favorite flavors of ice cream from the selected students in Leonia elementary school, since the ice cream flavors is nominal data, cannot be divided to compute. The Mode is the best measure of central tendency.

13. If a distribution were perfectly symmetrical and Mary got an exam score that was equal to the median, and John got an exam score that was equal to the mean, what would you know about their scores?

Answer I would know that Mary and John scores the same

14. A professor gave a very, very difficult exam. Vincent scored at the mode, Brandon scored at the mean, and Linda scored at the median. Place the names in order from who got the highest exam score to who got the lowest exam score.

Answer: Brandon Linda Vincent

15. A professor gave a very, very easy exam. Dan scored at the mode, Luci scored at the median, and Stephen scored at the mean. Place the names in order from who got the lowest exam score to who got the highest exam score:

Answer: Stephen Luci Dan

True / False Questions

Please type "T" if the statement is true, and type "F" if the statement is false in the provided spaces

 F 16. A student takes a 10-point quiz each week in statistics class. If the student's quiz scores for the first three weeks are 2, 6, 5, and 10, then the mean score is $M = 9$.

 T 17. A sample of $n = 6$ scores has $\Sigma X = 48$. This sample has a mean of $M = 8$.

 F 18. For the scores in the following frequency distribution table, the mean is $M = 3$.

<u>X</u>	<u>f</u>
4	1
3	4
2	2

 F 19. The mean is considered to be the "balance point" for a distribution because exactly half of the scores are located above the mean and exactly half are below the mean.

 T 20. In a sample of $n = 3$ scores, if two scores are each below the mean by 2 points, then the third score is above the mean by 4 points.

 T 21. A sample has $n = 5$ scores: 2, 4, 5, 8, and 11. The median for the sample is 6.5.

 T 22. There are situations for which it is either impossible to compute a mean or the mean does not provide a central, representative value.

 T 23. A distribution of scores has a mean of 50, a median of 53, and a mode of 56. Based on this information, it appears that the distribution is negatively skewed.

 T 24. If a negatively skewed distribution has a mean of 50, then the median and the mode are probably both greater than 50.

 T 25. For a positively skewed distribution, the mean usually has a larger value than either the median or the mode.