

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

1. What is the goal of central tendency, and why are there 3 measures of central tendency rather than, for example, just one measure?

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2. Find the mean, median, and mode for the following sample of scores: 6, 4, 3, 6, 5, 4, 3, 0

Mean \_\_\_\_\_ Median \_\_\_\_\_ Mode \_\_\_\_\_

3. Find the mean, median, and mode for the following sample of scores: 5,6,4,5,3,2,7,5,4,0,1

Mean \_\_\_\_\_ Median \_\_\_\_\_ Mode \_\_\_\_\_

4. Find the answers to the mean, median, mode, and the other expressions based on the following frequency table:

<u>X</u>	<u>f</u>			
5	2	Mean	_____	Median _____ Mode _____
4	2			
3	3			
2	2	N =	_____	EX = _____ (EX) <sup>2</sup> = _____
1	5			

5. Find the mean, median, and mode, and the other expressions based on the following frequency table.

<u>X</u>	<u>f</u>			
7	1	Mean	_____	Median _____ Mode _____
6	2			
5	5			
4	2			
3	2	N =	_____	EX = _____ EX <sup>2</sup> = _____

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

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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, 4, 19, 17, 2, 5, 9, 13, 6, 23, 11, 4, 6

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

Calculate mean for treatment 1 and put your answer here\_\_\_\_\_

Calculate mean for treatment 2 and put your answer here\_\_\_\_\_

Calculate the median for treatment 1 and put your answer here\_\_\_\_\_

Calculate the median for treatment 2 and put your answer here\_\_\_\_\_

Calculate the mode for treatment 1 and put your answer here\_\_\_\_\_

Calculate the mode for treatment 2 and put your answer here\_\_\_\_\_

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	1 3 1 3
6 5 4 3	4 1 5 3

Mean for humorous group: \_\_\_\_\_

Mean for non-humorous group: \_\_\_\_\_

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

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9. A researcher measured the time that a selected sample of students, aged 14 to 17, from a local New Jersey high school took to perform a sorting task. Here are the data in hours:

4, 6, 5, 4, 5, 7, 8, 6, 5, 7, 8, 9, 9, 1, 2, 2, 3, 5, 6, 4, 3, 7, 8, 4, 5, 6, 7, 8, 17, 6

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

Name the population: \_\_\_\_\_

Name the sample: \_\_\_\_\_

How many participants are in the sample? \_\_\_\_\_

Is the variable continuous or discrete? \_\_\_\_\_

What is the scale of measurement used to measure the variable ? \_\_\_\_\_

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:

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

What is the mean? \_\_\_\_\_ What is the mode? \_\_\_\_\_ What is the median? \_\_\_\_\_

What is the shape of this distribution? \_\_\_\_\_

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

Why?

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

10. You have collected the data representing the eye color of  $n=50$  students. What measure of central tendency might best represent these data? And why?

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11. You have measured how long it has taken each of  $n=25$  first graders to complete a puzzle. What measure of central tendency might best represent these data? And Why?

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12. If a distribution were perfectly symmetrical and Jane got an exam score that was equal to the mean, and Juan got an exam score that was equal to the mode, what would you know about their scores?

Answer \_\_\_\_\_

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

Answer : \_\_\_\_\_

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

Answer: \_\_\_\_\_

**True / False Questions**

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

\_\_\_\_\_ 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, 18, and 10, then the mean score is  $M = 9$ .

\_\_\_\_\_ 17. A sample of  $n = 5$  scores has  $\Sigma X = 45$ . This sample has a mean of  $M = 8$ .

\_\_\_\_\_

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

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

\_\_\_\_\_ 19. The mean will **always** be located at the point where the total distance between the mean and all of the scores below it equals the total distance between the mean and all of the scores above it.

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

\_\_\_\_\_ 21. A sample has  $n = 4$  scores: 2, 4, 5, and 11. The median for the sample is 4.5.

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

\_\_\_\_\_ 23. A distribution of scores has a mean of 28, a median of 33, and a mode of 35. Based on this information, it appears that the distribution is positively skewed.

\_\_\_\_\_ 24. If a positively skewed distribution has a mean of 30, then the median and the mode are probably both greater than 30.

\_\_\_\_\_ 25. For a negatively skewed distribution, the mean usually has a larger value than either the median or the mode.