

Lesson Summary

In this lesson, a formula was developed that measures the amount of variability in a data distribution.

- The absolute deviation of a data point is the distance that data point is from the mean.
- The mean absolute deviation (MAD) is computed by finding the mean of the absolute deviations (distances from the mean) for the data set.
- The value of MAD is the average distance that the data values are from the mean.
- A small MAD indicates that the data distribution has very little variability.
- A large MAD indicates that the data points are spread out and that at least some are far away from the mean.

Problem Set

- Suppose the dot plot on the left shows the number of goals a boys' soccer team has scored in six games so far this season, and the dot plot on the right shows the number of goals a girls' soccer team has scored in six games so far this season. The mean for both of these teams is 3.

Dot Plot of Number of Goals Scored for Boys' Team



Dotplot of Number of Goals Scored for Girls' Team



- Before doing any calculations, which dot plot has the larger MAD? Explain how you know.
- Use the following tables to find the MAD for each distribution. Round your calculations to the nearest hundredth.

Boys' Team	
Number of Goals	Absolute Deviation
0	
0	
3	
3	
5	
7	
Sum	

Girls' Team	
Number of Goals	Absolute Deviation
2	
2	
3	
3	
3	
5	
Sum	

- Based on the computed MAD values, for which distribution is the mean a better indication of a typical value? Explain your answer.

2. Recall Robert's problem of deciding whether to move to New York City or to San Francisco. A table of temperatures (in degrees Fahrenheit) and absolute deviations for New York City follows:

Average Temperature in New York City												
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature	39	42	50	61	71	81	85	84	76	65	55	47
Absolute Deviation	24	21	13	2	8	18	22	21	13	2	8	16

- a. The absolute deviations for the monthly temperatures are shown in the above table. Use this information to calculate the MAD. Explain what the MAD means in words.
- b. Complete the following table, and then use the values to calculate the MAD for the San Francisco data distribution.

Average Temperature in San Francisco												
Month	Jan.	Feb.	Mar.	Apr.	May	June	July	Aug.	Sep.	Oct.	Nov.	Dec.
Temperature	57	60	62	63	64	67	67	68	70	69	63	58
Absolute Deviation												

- c. Comparing the MAD values for New York City and San Francisco, which city would Robert choose to move to if he is interested in having a lot of variability in monthly temperatures? Explain using the MAD.
3. Consider the following data of the number of green jelly beans in seven bags sampled from each of five different candy manufacturers (Awesome, Delight, Finest, Sweeties, YumYum). Note that the mean of each distribution is 42 green jelly beans.

	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Bag 6	Bag 7
Awesome	40	40	41	42	42	43	46
Delight	22	31	36	42	48	53	62
Finest	26	36	40	43	47	50	52
Sweeties	36	39	42	42	42	44	49
YumYum	33	36	42	42	45	48	48

- a. Complete the following table of the absolute deviations for the seven bags for each candy manufacturer.

Absolute Deviations							
	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Bag 6	Bag 7
Awesome	2	2	1	0	0	1	4
Delight	20	11	6				
Finest	16						
Sweeties							
YumYum							

- b. Based on what you learned about MAD, which manufacturer do you think will have the lowest MAD?
Calculate the MAD for the manufacturer you selected.

	Bag 1	Bag 2	Bag 3	Bag 4	Bag 5	Bag 6	Bag 7	SUM	MAD
Awesome									
Delight									
Finest									
Sweeties									
YumYum									