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Assessing Overlapping Data Sets - Guided Lesson Explanation

Explanation#1

1a. The mean weight of the apple boxes are 4.8333 kg. The mean weight of the mango boxes is 5.6666 kg**.** The average mango box is heavier.

1b. The weight difference of average boxes is:

Mango box average **–** Apple box average **= average** weight difference

5.6666 kg – 4.8333 kg **=** 0.8333 kg

1c. The mean absolute deviation (MAD) tells us the degree of variability of any data set. The greater the MAD value, the more variability. We can calculate the MAD for each set by finding the mean of each set:

Apple: 3, 8, 2 Mean = (3 + 8 + 2) / 3 = 4.333

Mango: 3, 8, 9 Mean = (3 + 8 + 9) / 3 = 6.666

Determine the deviation of each variable from the mean:

Apple: 3 – 4.33= -1.33 8 – 4.33= 3.67 2 – 4.33= -2.33

Mango: 3 – 6.66 = -3.66 8 – 6.66= 1.34 9 – 6.66= 2.34

Make all the values absolute and average them to find the MAD.

Apple: (1.33 + 3.67 + 2.33) / 3 = 2.443

Mango: (3.66 + 1.34 + 2.34) / 3 = 2.446

The MAD of the 3 Apple boxes (2.443) is smaller than the MAD of 3 Mango boxes (2.446). This indicates that there is more variability between the mango boxes.

Explanation#2

2a. The mean number of correct for math was 4.42 as compared to the mean number correct for of English of 5.28**.** The average number correct for English was higher.

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2b. The difference of average number correct =

Avg. # correct (English) **–** Avg. # correct (Math)

5.28 – 4.42 **=** 0.86

2c. The mean absolute deviation (MAD) tells us the degree of variability of any data set. The greater the MAD value, the more variability. We can calculate the MAD for each set by:

1. Find the mean of each set:

Math: 5, 2, 7 Mean = (5 + 2 + 7) / 3 = 4.666

English: 3, 6, 9 Mean = (3 + 6 + 9) / 3 = 6

2. Determine the deviation of each variable from the mean:

Math: 5 – 4.666= 0.334 2 – 4.666= -2.666 7 – 4.666= 2.334

English: 3 – 6 = -3 6 – 6= 0 9 – 6= 3

3. Make all the values absolute and average them to find the MAD.

Math: (0.334 + 2.666 + 2.334) / 3 = 1.778

English: (3 + 0 + 3) / 3 = 2

The MAD of the 3 English students (2) is larger than the MAD of 3 math student (1.778). This indicates that there is more variability between the English students.

Explanation#3

a. The mean day time speed is 76.42 (mph) as compared to the mean nighttime speed of 75.71 (mph)**.** Drivers are driving slightly faster during the daytime.

b. We already have the mean of each set. Now find the deviation of each variable from the mean.

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Daytime:

80 – 76.42 = 3.58

75 – 76.42 = -1.42

64 – 76.42 = -12.42

82 – 76.42 = 5.58

78 – 76.42 = 1.58

80 – 76.42 = 3.58

76 – 76.42 = -0.42

Nighttime:

70 – 75.71 = -5.71

73 – 75.71 = -2.71

78 – 75.71 = 2.29

80 – 75.71 = 4.29

75 – 75.71 = -0.71

85 – 75.71 = 9.29

69 – 75.71 = -6.71

Find the MAD (add up the absolute deviations and divide them by the total):

Daytime: 28.58 / 7 = 4.08

Nighttime: 31.71 / 7 = 4.53

The larger the MAD, the greater the variability in the data. Night time has a larger degree of variability. So, Donna is incorrect in her assumption.