MATH 3307

Homework 1 (Lessons 1 to 5)

Instructions: Answer all questions through the EMCF tab of casa under the assignment named "Homework 1" before the deadline.

There is no "Submit" button. Your answers will be automatically submitted once the deadline arrives.

Assignments will be graded out of 20 points.

1. An elementary school is considering a new lunch menu. As part of this process, they send out questionnaires to all students with last names beginning with M through R. Identify the population and the sample.

    A. Population: All Children in the Country; Sample: All Children with last names beginning with M through R

    B. Population: All Students at the Elementary School; Sample: All Students at the Elementary School with last names beginning with M through R

    C. Population: All Students at the Elementary School with last names beginning with M through R; Sample: All Students at the Elementary School

    D. Population: All People; Sample: All Children attending the Elementary School

    E. Population: All Students at the Elementary School; Sample: All Students at the Elementary School that eat lunch

2. Identify the type of data being collected: The amount of water a person consumes on a daily basis.

    A. Quantitative, Discrete

    B. Quantitative, Continuous

    C. Categorical

    D. Elemental

    E. None of the Above Choices

3. Identify the type of data being collected: The number of days in November that the temperature was above 85°F.

    A. Quantitative, Discrete

    B. Quantitative, Continuous

    C. Categorical

    D. Elemental

    E. None of the Above Choices

4. The population change for the ten most populous counties in the US from 2000 to 2010 are given in the following table: Determine the mean and median for these data.

    A. Mean: 79.2; Median: 7.92

    B. Mean: 6.25; Median: 7.92

    C. Mean: 12.23; Median: 6

    D. Mean: 7.92; Median: 6.25

    E. Mean: 8; Median: 6

County	Percent Change
Los Angeles, CA	3.1
Cook, IL	-3.4
Harris, TX	20.3
Maricopa, AZ	24.2
San Diego, CA	10.0
Orange, CA	5.8
Kings, NY	1.6
Miami-Dade, FL	10.8
Dallas, TX	6.7
Queens, NY	0.1

5. A sample of 15 adults who live in a large urban area were asked to indicate the number of parking tickets each had received in the past 5 years. The data are given below. Find the mean, variance, and standard deviation of the data.
3, 0, 1, 2, 2, 6, 1, 3, 0, 1, 0, 2, 2, 5, 4

    A. Mean: 2.133; Variance: 3.267; Standard Deviation: 10.673

    B. Mean: 2.133; Variance: 1.344; Standard Deviation: 1.807

    C. Mean: 2.133; Variance: 3.267; Standard Deviation: 1.807

    D. Mean: 3.000; Variance: 1.807; Standard Deviation: 3.267

    E. Mean: 3.000; Variance: 3.267; Standard Deviation: 1.807

6. Calculate the range, interquartile range, and 70th percentile of calories for each burger from the accompanying table.

A. Range: 250 to 1230; IQR: 305; 70th Percentile:

B. Range: 980; IQR: 305; 70th Percentile: 11.2

C. Range: 980; IQR: 305; 70th Percentile: 840

D. Range: 980; IQR: 472.5; 70th Percentile: 12

E. Range: 980; IQR: 472.5; 70th Percentile: 840

Burger	Calories
McDonald's Hamburger	250
McDonald's Cheeseburger	300
McDonald's Quarter Pounder	410
McDonald's Double Quarter Pounder with Cheese	740
McDonald's Big Mac	540
McDonald's Big N' Tasty with Cheese	510
Burger King (BK) Whopper with mayo	670
BK Double Whopper with cheese and mayo	990
BK Triple Whopper with cheese & mayo	1230
Wendy's 1/4 lb Single	430
Wendy's 1/2 lb Double with Cheese	710
Wendy's 3/4 lb Triple with Cheese	980
Wendy's Baconator	840
Arby's Beef and Cheddar	445
Jack in the Box Hamburger Deluxe with Cheese	460
Jack in the Box Bacon Ultimate Cheeseburger	1090

Use the following for problems 7 and 8:

Below is a stem and leaf diagram of the of exam grades in a college class.

The decimal point is 1 digit(s) to the right of the |

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5|3 4 6 7
6|1 8 9 9
7|3 4 5 5 7 8 8 9
8|0 0 1 4 5 8 8
9|0 1 1 3 5 7 7 8
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7. Find the median (Use the same Answer Choices for 7 & 8)

8. Find the mean

A. 7.346

B. 78.516

C. 7.852

D. 79

E. 77

9. A data set, containing all integers, both the mean and median have the value of 17. The maximum value in the data set, which is the smallest possible outlier on the high side, is 34. Give the five-number-summary of this data set.

   A. [0, 13, 17, 21, 34]

   B. [1, 12, 17, 22, 34]

   C. [0, 12, 17, 17, 34]

   D. [0, 15, 17, 19, 34]

   E. Cannot be determined from the information provided.

Use the following for questions 10 – 17:

Using R Studio and the data set *precip* determine the following.
Precip - The average amount of precipitation (rainfall) in inches for each of 70 United States (and Puerto Rico) cities. *Hint*: the variable *precip* is already downloaded into R studio. To determine how to get the following see R studio quick reference guide.

10. Calculate the Mean

11. Calculate the Median

12. Calculate the Standard Deviation

   Choices for Questions 10, 11, 12:

   A. 13.707   B. 187.882   C. 3.702   D. 34.886   E. 36.6

13. Determine the Five Number Summary

   A. 13.7; 29.1; 34.9; 36.6; 42.8

   B. 7.0; 29.1; 36.6; 42.8; 67.0

   C. 7.0; 29.1; 34.9; 42.8; 67.0

   D. 3.7; 13.7; 34.9; 36.6; 187.9

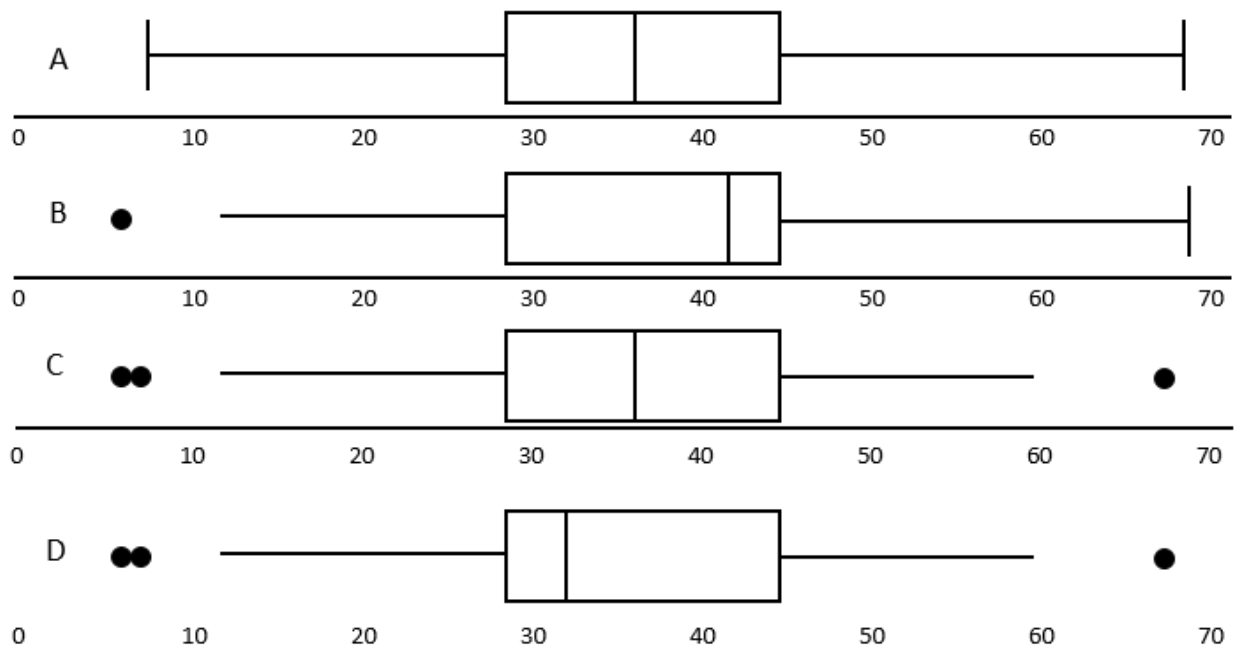   E. 7.0; 34.9; 36.6; 39.8; 67.0

14. Calculate the Interquartile Range

       A. 13.7

       B. 71.9

       C. 63.4

       D. 60.0

       E. 6.2

15. Determine the Range for Outliers

       A. Less than 8.55 or Greater than 56.3

       B. Less than 13.5 or Greater than 42.8

       C. Less than 13.5 or Greater than 80.5

       D. Less than 8.55 or Greater than 63.35

       E. Less than 15.6 or Greater than 56.3

16. Identify the correct Box and Whisker Plot (No Choice E for this Question)

17. Which best describes the shape of the distribution?

     A. Nearly Symmetric

     B. Right Skewed

     C. Left Skewed

     D. Uniform

     E. Bimodal

18. Circle which is the most resistant to outliers?

     A. mean

     B. median

     C. range

     D. variance

     E. none of these

19. A set of data is found to have a sample variance of 81. Suppose that 16 is added to each of the numbers in the data set. Circle the standard deviation of the new data set?

a. 4

b. 9

c. 13

d. 81

e. 97

20. Two employees of a company have to file expense reports for their travel. The first had taken 7 trips with a mean trip cost of $750. The second took a total of 5 trips with a mean cost of $1200. The accounting department wants to determine the mean cost of all the trips that these two employees took. What is the mean cost of all 12 trips?

Proposed Solution:

Since we have two costs (one for each employee) we can find the mean cost of both employees by the following computation:

(750 + 1200) / 2 = 975

What was done wrong in the proposed solution?

      A. Since there are 12 total trips, the calculation should be (750 + 1200) / 12

      B. Since there are 7 trips with a mean of 750 and 5 with a mean of 1200, the calculation should be (7×750 + 5×1200) / 12

      C. Since we do not have the original data from each of the 12 trip costs, a mean cost cannot be calculated.

      D. Since the two costs are not close to one another, a median should be used.

      E. The proposed calculation is correct.