**STATS PROJECT #2 – CENTER AND SPREAD**

**NAME:**

**CLASS:**

**DATE**: June 16, 2019

**PART A – CENTER**

A1 Search the internet and define the term “statistic”.

>

Website URL:

A2 There are 3 measures (statistics) for center: mean, median and mode. Briefly describe what each is, how to find it, and list any pros/cons.

Mean (also known as Average)

Definition:

>

How do you find it?

>

Pros:

>

Cons:

>

Website URL:

Median

Definition:

>

How do you find it?

>

Pros:

>

Cons:

>

Website URL:

Mode

Definition:

>

How do you find it?

>

Pros:

>

Cons:

>

Website URL:

A3 The mode is often worthless. For example, on a lot of my assignments, the mode is 0 (meaning the student didn’t turn it in). Is this measure reflective of how the class or typical student did? Of course not. Of the remaining two measures of center (mean and median), explain which measure you think is the best to describe the center.

>

A4 In a math class, there are 5 tests that make up the semester grade and they are all worth the same (20%). Consider Student X and Student Y which received the following scores on the tests.

|  |  |
| --- | --- |
| **Student X** | **Student Y** |
| **90** | **64** |
| **94** | **70** |
| **88** | **60** |
| **60** | **100** |
| **92** | **62** |

Calculate the mean and median for each student.

|  |  |  |
| --- | --- | --- |
|  | **Student X** | **Student Y** |
| **Mean** |  |  |
| **Median** |  |  |

If you were the teacher, which grade would you give each student. Explain in detail.

Student X Grade:

>

Explanation:

>

Student Y Grade:

>

Explanation:

>

A4 Go to <https://creativemaths.net/blog/median/> and review the page. In light of your student grading above and the author’s input, what are your feelings about mean and median now?

>

Would the grades you gave Student X and Y change? If so, to what?

>

**PART B – SPREAD**

B1 Consider Graduate X and Graduate Y which received the following scores.

|  |  |
| --- | --- |
| **Graduate X** | **Graduate Y** |
| **82** | **70** |
| **76** | **100** |
| **80** | **90** |
| **78** | **60** |
| **84** | **80** |

Calculate the mean and median for each graduate.

|  |  |  |
| --- | --- | --- |
|  | **Graduate X** | **Graduate Y** |
| **Mean** |  |  |
| **Median** |  |  |

Are these two graduates identical?

>

Explain.

>

If you are a restaurant owner, which graduate would you hire?

>

Why?

>

If you are an advertising company owner, which graduate would you hire?

>

Why?

>

B2 Go to <http://www.abs.gov.au/websitedbs/a3121120.nsf/home/statistical+language+-+measures+of+spread> and review the page. According to the 1st section on the webpage, what are the 5 measures of spread?

>

According to the 3rd section of the same webpage, what do the measures of spread summarize? (Did you notice how they spelled summarize?)

>

Based on this information, how would you describe our graduates from above?

>

Look at the green box on the bottom of the page. Are you familiar with that notation or does it scare you?

>

Luckily for us, technology comes to the rescue. Look at the Excel spreadsheet Center and Spread and copy the measures of spread (cells A12:B18 in red) to the table below.

|  |  |  |
| --- | --- | --- |
|  | **Graduate X** | **Graduate Y** |
| **Range** |  |  |
| **Q1** |  |  |
| **Q2** |  |  |
| **Q3** |  |  |
| **IQR** |  |  |
| **Variance** |  |  |
| **Standard Deviation** |  |  |

B3 Understanding (or trying to understand) Excel.

Click on cell **A12** and look at the text box on the top of the page.

What does it say?

>

Describe what this cell is trying to compute?

>

Click on cell **B16** and look at the text box on the top of the page.

What does it say?

>

Describe what this cell is trying to compute?

>

**PART C – GATHERING AND WORKING WITH DATA**

C1 Ask the first 15 males you see their first name and their weight (in pounds). Record your results. Transfer the data to cells C21:B35 in the Excel spreadsheet. When you do that, **the spreadsheet will calculate a bunch of statistics for you** (you are welcome!).

|  |  |
| --- | --- |
| **First Name** | **Weight (lbs)** |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |
|  |  |

C2 Measures of Center

What is the mean?

>

What is the median?

>

Are they close? If they are very different, what does that tell you?

>

C3 Measures of Spread

What is the range?

>

What is the IQR?

>

What is the standard deviation?

>

C4 Research the internet using keywords “statistics sample population” and describe the differences between sample and population.

>

Website URL:

C5 The “5 Number Summary” is often a useful tool to help analyze data. Complete the table by copying the purple cells B41:B45 from the Excel spreadsheet.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Min** | **Q1** | **Med** | **Q3** | **Max** |
|  |  |  |  |  |

C6 A Box and Whisker Plot (sometimes referred to as a Box Plot) is a graphical representation of the 5 Number Summary. Go to <https://www.purplemath.com/modules/boxwhisk.htm> and review the page. Draw a horizontal Box and Whisker Plot for the 5 Number Summary by hand. You can either do this on a piece of paper, take a picture, then insert the image below, or you can use the draw feature of Word. Your choice.

C7 Creating a Box and Whisker Plot on Excel is extremely frustrating. Note the yellow shaded area on the Excel spreadsheet named “For Graphing Only”. After you create these numbers, it takes a lot of fooling around to get a decent looking plot. Look at my attempt on the next page of the spreadsheet named “Box and Whisker” and tell me what you think of it. Be sure to add a title and label the axis.

>

C8 Save this Word document and the Excel spreadsheet as firstname.lastname.centerandspread (different extensions) and email both to me.