

Statistics Detective Review

Goal: Review concepts from the statistics and probability segment.

Goal: Investigate real-world data and interpret key features.

Goal: Utilize technology to adapt or build and use mathematical formulas that include cell referencing to answer real-world questions and interpret results

Instructions: I selected a person by random number generator and built clues from there. Use these clues in order to identify the "winner" in our **classdata.xlsx** on ASULearn. To mark off eliminated people on the computer, be sure that up at the very top of the screen View/Ribbon is checked (View is on the very top menu between Edit and Insert, not on the lower menu) and that you can see the paint can under Home. You can then use the fill-in feature to eliminate suspects by clicking on the row number and then the paint can. **Once someone violates one clue, they are out of the running.** In this way, your document can show who is left:

 **The suspect...**

1. supports the statement that says that the average person is *better* able to remember real words than nonsense words.

Eliminate people who contradict the clue and remember nonsense words at least as well as real words. Choose a color for this clue and highlight any eliminated rows in that color in Excel by selecting the entire row and painting it. Keep track of the elimination color.

Check that you've eliminated 5 people from consideration.

2. has a golden mean of $(1+\sqrt{5})/2 \sim 1.618$, within a .200 margin of error, embedded in the forearm to hand ratio, i.e. $1.618 \pm .200$.

-What are lower and upper boundaries for the interval rounded to 3 decimal places for $1.618 \pm .200$?

lower boundary: _____ upper boundary: _____

-Which column letter represents forearm? _____ hand? _____

-If we wanted to look at the ratio of columns Z/Y in Excel for person 2, we would use the Excel cell referencing command =Z2/Y2. Using Excel cell referencing, what is the Excel formula for forearm/hand for the first person in row 2 (don't forget the equal sign and use the columns you listed above rather than Z and Y)?



_____ Type this into K2 and hit return. Go back to that box, go to the bottom right until you see the symbol change to a black plus, click and fill down the column for the forearm to hand ratios.

-Eliminate those remaining who *contradict* the statement and have a ratio **outside the interval** since the suspect is within. Choose a clue 2 color and highlight any new eliminations in Excel. Keep track of the elimination color. **Eliminate anyone (who hasn't already been eliminated) less than the lower boundary and eliminate anyone greater than the upper boundary.**

Check that you've eliminated 6 additional new people from consideration.

3. falls outside the middle 50% of the class on the boxplot of the distance from home.

-First, as a review, **sketch the boxplot by-hand** after you type in quartile commands in Excel to give you the 5-number summary.

=quartile(b2:b19,4) _____

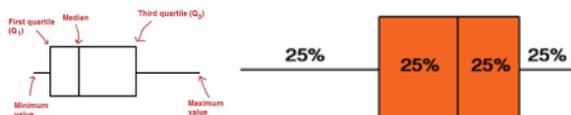
By-hand sketch:

=quartile(b2:b19,3) _____

=quartile(b2:b19,2) _____

=quartile(b2:b19,1) _____

=quartile(b2:b19,0) _____



Set a reasonable scale for the axis as you sketch. Next, eliminate rows who contradict the statement and who fall strictly on or inside the box borders – i.e. **eliminate those who are between Q_1 and Q_3**

Choose a different color and highlight any new eliminations in Excel.

Check that you've eliminated 1 additional new person from consideration.

4. hits the 1st quartile "on the head" for the number of competitors of the family bathroom.

-Which column does the clue apply to? _____

-Use Excel cell referencing: what is the command for Q_1 for this column (see #3 and adapt)? _____

-What is Q_1 of this column: _____

-Eliminate those who are different than Q_1

You'll eliminate 2 additional new people from consideration and then you should have 4 people remaining at this point. Write down the number of each row that is left.

5. has a y-value within 10cm of the best fit line for "does armspan predict height."

-In the inferences lab, we saw that the full scatterplot of armspan and height had a best fit line of $y = 0.3481x + 98.972$ so use this to compute the *predicted line value of height* by plugging in the *armspan* (the x value) of ONLY your remaining suspects into the equation of the line. **Show work**. Also write down the actual height of each person from Excel.

Predicted height $y =$ _____ = _____ Actual height = _____

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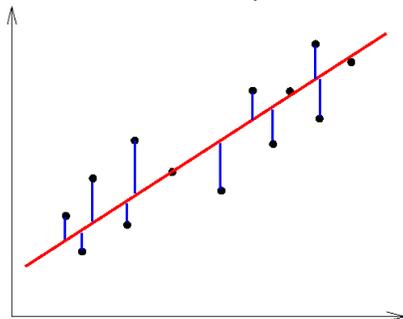
Predicted height $y =$ _____ = _____ Actual height = _____

Predicted height $y =$ _____ = _____ Actual height = _____

-Compare the predicted line height value with the actual height and **eliminate the people whose difference is greater than 10cm**

-Which row is the "winner" _____

-Does the "winner" drag the line up or down or is it on the line? I.e. is their actual height value above, below, or the same as the predicted line value?



Circle one: above below same

6. Verify your responses with your neighbors and ask me any questions (I'm not collecting this lab because of the exam tomorrow).
7. Before you leave, let me know if you have questions about the exam tomorrow or completing any ASU Learn items in this segment!