

data analysis think-pair-share
Dr. Sarah's MAT 1010: Introduction to Mathematics

Part A: Answer all 12 questions below and type your responses for the data analysis think-pair-share forum. Add a new discussion topic with the subject as your preferred name and the post as your responses.

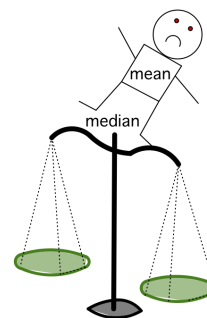
Part B: Respond separately to at least two of your classmates postings in a meaningful way. Use their preferred name (like Dr. Sarah is mine), with something new that justifies your position on (at least) one of the questions. Don't just say, "Yeah, I agree." Instead, say, "Yes preferred name, but we also need to consider..." Or, "Preferred name, I don't agree because..." You might also pose questions, answer questions, extend ideas, or compare and contrast your responses and summarize what you chose and why.

1. Search the web for information about the golden ratio and places in nature where it can be found and write down one item you found interesting.
2. Here is a data set that measures population growth rates in the US from 1910–1919:

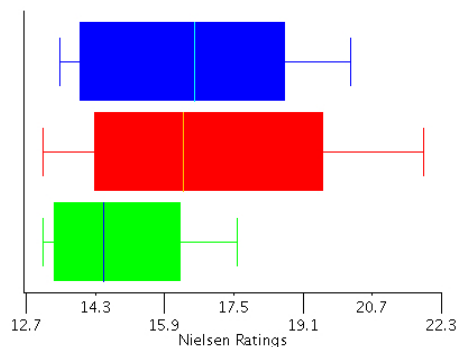
year	1910	1911	1912	1913	1914	1915	1916	1917	1918	1919	1920
population growth	2.1%	1.56%	1.56%	1.96%	1.92%	1.44%	1.4 %	1.27 %	−.06%	1.26 %	1.85%

Use a scale balancing idea to analyze how the rate in 1918 would impact the mean/average:

- a) drag the mean down from the median
- b) drag the mean up from the median
- c) would not impact the mean

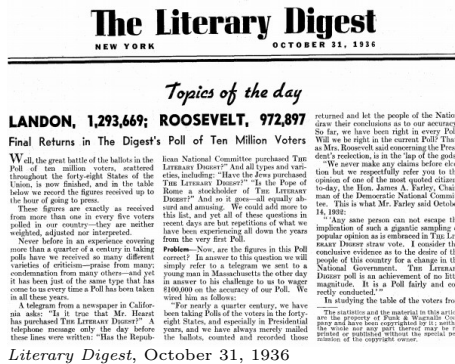


3. What happened in real-life in 1918 that led to this rate?
4. Here is Nielsen ratings (roughly represents the percentage of households tuned in). Use the boxplots to award "best network"



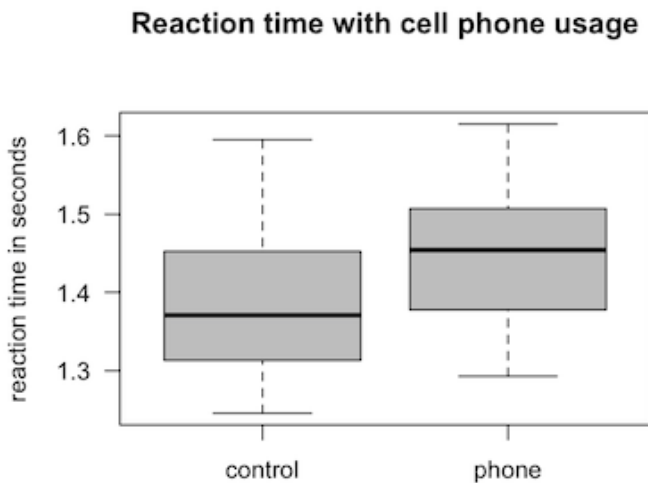
- a) ABC (top boxplot)
- b) CBS (middle)
- c) NBC (bottom)
- d) there should be more than 1 winner
- e) other

5. Next discuss how to spin the statistics positively (but still truthfully) using only the boxplots for each of the other networks you didn't select: Here's good news, we are the best network because... In one of them, it may be challenging to say something positive but truthful, but think creatively!
6. Which is true for CBS, the middle boxplot?
 - a) The mean is probably higher than the median
 - b) The mean is probably lower than the median
 - c) The mean is probably about the same as the median
7. With regard to the 1936 Landon and Roosevelt election and the *Literary Digest* poll that predicted the winner as Landon:
 - a) the sample size was not large enough
 - b) the sample was not diverse enough
 - c) Landon would have won—but Roosevelt's win was due to a last minute change in sentiment
 - d) other



8. Which of the following in *The Heart of Mathematics* readings did you find most compelling?
 - a) inconsistencies in scaling can lead to false interpretations
 - b) the average American or average salary of Lakeside school can be very misleading. Half of the people are not necessarily below average.
 - c) sampling pitfalls such as convenience sampling, voluntary responses, and asking unclear or misleading questions
 - d) other
9. Is it appropriate for scientists and mathematicians today to use data obtained under what we agree were morally reprehensible conditions, like the syphilis experiment in Tuskegee, Alabama or many experiments in Nazi Germany? **Answer all of the following:**
 - 9a) First write down what you think is the strongest argument from the “yes” side.
 - 9b) Next write down what you think is the strongest argument from the “no” side.
 - 9c) Lastly, what do you think? [select from yes, only in certain circumstances, or no]

10. Kat is making measurements in lab and is confident that they have set it up properly. When Kat tries to do the required calculations to verify the formulas in the book, the data seems wrong. So Kat does the mathematical calculations to determine what a correct set of data would be and simply changes the data to match the calculations. What do you think?
- I feel strongly that Kat's actions are ok
 - I somewhat feel that Kat's actions are ok
 - I somewhat feel that Kat's actions are problematic
 - I feel strongly that Kat's actions are problematic
 - other
11. A research group wants to study the effectiveness of a quercetin supplement, and has contacts at the Watauga County Detention Center, Rikers Island in New York, and Silivri Penitentiaries Campus in Turkey. Quercetin is a flavonoid found in fruits and vegetables that is a strong antioxidant. Do you think Appalachian State University's Institutional Research Board (IRB) will approve such research?
- yes and I have a good reason why
 - yes but I'm unsure of why
 - no but I'm unsure of why not
 - no and I have a good reason why not
 - other
12. In the following we see two side-by-side boxplots on reaction times. The first boxplot is a control group and the second are people using their cell phones. What can you say about the data from the median to Q3, the third quartile, of the reaction times?
- the median to Q3 cell phone users did better because is more tightly clustered together
 - the median to Q3 control group did better because the data is lower
 - other (explain)



Picture: http://digitheadslabnotebook.blogspot.com/2010_06_01_archive.html