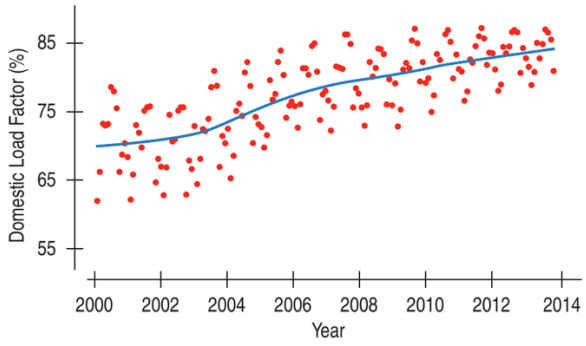
Practice RAT for Week 04, Tuesday
Answers at the end

1. Page 118 in DVVB Question 7

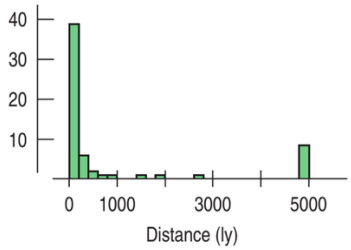
7. Load factors 2013 over time Here is a timeplot of each monthly load factor for domestic flights for 2000 to 2013 along with a lowess smooth.



a) Describe the patterns you see in this plot.
b) Do you expect the overall pattern to continue for another decade? Why or why not?

2. Page 119 in DVVB Question 9

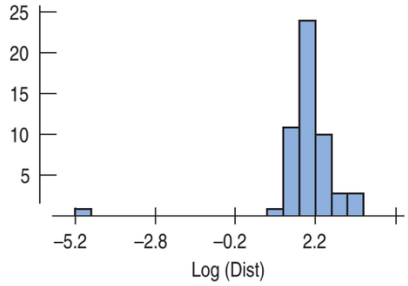
9. Exoplanets Discoveries of planets beyond our solar system have grown rapidly. Here is a histogram showing the distance (in light-years) from earth to stars having known planets (as of 2014).



Explain why it might be beneficial to re-express these distances.

3. Page 119 in DVVB Question 10

10. Exoplanets re-expressed Here are the exoplanet distances of Exercise 9, re-expressed to the log scale.



a) Is this a better scale to understand these distances?
b) The low outlier is "sol"– that is, it is the distance of the sun from the earth. Do you think it belongs with these data?

Answers:

7. a) After a period of little change in 2000–2001, load factors have been increasing steadily.

b) No. These are percentages, so they can't exceed 100%. Moreover, we have no reason to believe this trend will continue.

9. Data with a distribution this skewed are difficult to summarize. The extremely large values will dominate any summary or description.

10.

a) It does transform the original distribution from one that was skew to the right to one that is proximately symmetric and normal.

b) It takes 0.00001581 light-years from earth to reach the sun. With such a small value that is close to 0, the re-expression to the log scale can produce a large negative value. Yes, it does belong to these data.