

Stat 3000
Extra Credit Homework
Due: Wednesday, August 6
No late papers accepted!

10 questions, 10 points each. Your score on this assignment will be added to your homework total.

Read *either* pages 16–31 of *Visual and Statistical Thinking* (ask for “Chris Corcoran 1B” from the SciTech Library Reserve) or pages 38–53 of *Visual Explanations* (“Michael Minnotte P93.5 T846 1997 c.2”). Both contain the same material by E.R. Tufte on the explosion of the space shuttle Challenger. Based on your reading, answer the following questions:

1. What were the rocket engineers concerned about on the day before the flight, and why? What made them change their recommendation?
2. In the paragraph that begins at the bottom of page 17 (*VST*)/39 (*VE*), what does Tufte mean by the phrase “the accident appears thoroughly overdetermined”?
3. What was the *available* “sample” that enabled the engineers and other officials to infer something about the next (i.e. Challenger) launch? What population did this sample represent?
4. The day before the shuttle launch, the rocket engineers presented an analysis along with a recommendation. Very briefly, describe the contents of this analysis.
5. Name 3 key weaknesses (as described by Tufte) of the engineers’ presentation.
6. What was the critical omission (in terms of the available sample) that weakened the engineers’ recommendation? Why wouldn’t NASA officials accept their recommendation?
7. Briefly and clearly describe what you see in the scatterplot at the top of page 23 (*VST*)/45 (*VE*).
8. Briefly describe some of the problems associated with the plots and charts presented during the testimony before the presidential commission.
9. Who was Richard Feynman, and what “experiment” did he demonstrate before the committee? In what way was his demonstration pivotal to the investigation?
10. Describe specifically how the principles discussed in the *Conclusion* (page 31 (*VST*)/53 (*VE*)) apply to research in your field. Use an example, if possible.