

# Problem set 1

S670 Fall 2019

**Upload one PDF, HTML, or Word document to Canvas by 11:59 pm, Friday 24th September.**

Write a three-paragraph essay on the following topic: **In general, should studies published in academic journals use  $P$ -values?** Your essay may be for the use of  $P$ -values, against the use of  $P$ -values, or it might argue that it depends.

Your essay should be about a page, and have the following structure:

- Paragraph 1: Explain why the use of  $P$ -value-based “statistical significance” for decision-making has become controversial in recent years.
- Paragraph 2 (the long one): Find ONE real-life study in which  $P$ -values are used. What is the study’s argument, and are the  $P$ -values important to it? Do the  $P$ -values distract from more important things? Do the  $P$ -values show they’re supposed to show? If not, why not?
- Paragraph 3: Make a conclusion, and justify it. If you don’t think  $P$ -values should be used, suggest what kinds of statistical analysis should be used instead.

**Why are we making you do this?** We want you to think about how you might use the EDA techniques you’ll learn in this course—should they be used instead of confirmatory statistical methods, or should they be used in conjunction with them? More practically, this course requires writing reports, and some of you may not have written anything long in a long time, so it’ll be good to get some practice for somewhat low stakes.

## Grading

You’ll be graded on the quality of argument of your essay, not your position. The most important thing is that whatever your argument is, we should be able to follow it (i.e. your conclusion should follow from what you’ve written previously.) Small numbers of minor writing errors won’t matter, but you should spell-check your work.

## Much more further reading than you want

- American Statistical Association statement on  $p$ -values. Press release: <https://www.nature.com/articles/d41586-019-00857-9>; full statement: <https://amstat.tandfonline.com/doi/full/10.1080/00031305.2016.1154108>
- Amrhein et al., “Scientists rise up against statistical significance”: <https://www.nature.com/articles/d41586-019-00857-9>
- All of Andrew Gelman’s blog: <https://statmodeling.stat.columbia.edu/>