

# A Quick Summary of Recent Problem Sets

This could be quite handy for seeing the forest for the trees as we approach Exam 2

*I just discovered that I named two problem sets “Problem Set 10.”* Because of this screw-up, a summary is needed. Actually, it is pretty helpful to have a summary even if I hadn’t screwed up the problem set numbering.

## **Problem Set 10, Oct. 29**

This was a re-do of the Hamilton vs. Madison Author problem that illustrated how sensitive to being near the edge of a histogram bin the Donovan & Mickey approach was. We just changed the number of words in the essay from 2008 words to 1992 words while still keeping the number of “upon”s as 2, and this put the essay in a different histogram bin.

## **Problem Set 10, Nov. 1**

This was the Mudslide problem — which I consider to be a more realistic and therefore compelling alternative to the what-month-is-Mary’s-birthday problem. The point of this problem is to jump us from 2 or 3 mutually exclusive hypotheses to 12 mutually exclusive hypotheses. Why is that a big deal? Because we are on our way to an infinity of mutually exclusive hypotheses.

## **Problem Set 11, Nov. 5**

This was the Mug Breakage problem which was your first encounter with a continuum of mutually-exclusive hypotheses characterized by the mug breakage rate,  $a$ . There are an infinite number of possible values of  $a$  with a prior that forced  $a$  to be between 2 and 6. Notice that the data still takes on discrete values (1 mug was broken last week, or 4 mugs, but never 4.6 mugs).

## **Problem Set 12, Nov. 9**

This was the Bacterium Survival Time problem. In this problem there is once again a continuum of mutually-exclusive hypotheses characterized by an average bacterial survival time,  $m$ , which the prior forced to be between 4 and 6. The radically different thing about this problem is that in addition to the model parameter being in a continuum, the data is now in a continuum too!

## **Looking ahead, Problem Set 14, Nov. 15**

Since there were two Problem Set 10’s the first problem set after Exam 2, due on Nov. 15, will be Problem Set 14. It will relate to Chapter 10 and will be your first encounter with Bayesian conjugates.