Chapter 6 Portfolio Contribution

From {libraries.uky.edu}, access the online version of the article “An Introduction to Empirical Bayes Data Analysis” by George Casella, which was originally published in *The American Statistician* in 1985. Read the article as best as you can. You are not expected to understand every detail. Then respond to the items below. Please include a formal bibliography and in-text citations as needed.

Required for undergraduate and graduate students:

1. Consider the baseball data in Table 1. For a hypothetical baseball player hitting .267 after 45 at bats, what would be the predicted final batting average ?

2. Consider the baseball data in Table 1. One cannot obtain a batting average of .395 in 45 at bats: 17 divided by 45 is .378, and 18 divided by 45 is .400.\* For the present purpose, though, suppose that this player had 18 hits in 45 at bats. Likewise, suppose that the other players had numbers of hits given by the formula round(45 x observed batting average). Use the approach illustrated on pages 12 through 15 of the Chapter 6b slide deck to predict the final batting averages of the seven players; you may use either posterior means or posterior modes for your predictions, but clearly indicate which you are using. Compare your predictions to those in Table 1.

3. Describe, based on your reading but using your own words, why a beta prior with *a* < 1 and *b* < 1 may make sense for the consumer intent data.

\* If you are a baseball fan, you may be aware that walks and sacrifices are not counted as at bats, and so the .395 may represent, for instance, 17 hits in 43 at bats with 2 walks.

Required for graduate students only:

4. How do formulas (2.3) and (2.4) compare with page 14 from the Chapter 5b slide deck ?

5. What happens in formula (2.7) when p = 3 ? Use this to explain why result (2.8) cannot be true when p = 3.