

Assignment #8

This assignment is due in class next Thursday, April 15, 1999. As with previous assignments, I expect that you will talk to classmates about the assignment, but expect each of you to do the work yourself. For this assignment, you will be experimenting with subjective confidence intervals.

A group of managers is trying to anticipate the level of sales of a new type of product. The new product is similar to past items the company has made and launched successfully, but different enough that they are anxious about well the product sell. Using data from past product launches, the company has built a regression model. The predictions from this regression model need to be combined with the “personal estimates” obtained from managers.

(1) Two managers gave their intervals (in \$1000US) as

Bob	1500 to 3500
Harry	2000 to 5000

- (a) Pool the results from the two subjective intervals and give a combined 50% interval.
- (b) Suppose that you have learned that Bob and Harry spent a great deal of time discussing the product before telling you these ranges. Does that raise any particular concern for the interval found in “a”.

(2) Suppose instead of the two intervals given above, two managers report these intervals

Bob	1500 to 3500
Dick	9000 to 11000

- (a) Again, pool the intervals as in #1 above and obtain a net 50% interval.
- (b) Compare your pooled interval to the two intervals offered by the two managers. What is your conclusion about the uncertainty in the project given by the pooled interval? Can you reconcile the accuracy conveyed by your pooled interval with that implied by either Bob or Dick?
- (c) Suppose instead that you model the two intervals of Bob and Dick as normal-based, 95% intervals. What sort of pooled interval do you get now, and how does it compare to your answer in “a”?

(3) Finally, for a third variation on this theme, suppose that we had an interval from Bob and an interval based on a 95% prediction interval from a regression model,

Bob	1500 to 3500
Regression 95% interval	2000 to 5000

- (a) Pool these two sources to find a combined 50% interval.
- (b) Compare the interval constructed in this example to the interval obtained in #1. Do the results differ by much, or are they essentially the same?

(4) As in #3, but suppose that the regression 95% interval is that from Dick in #2, [9000,11000].

- (a) Pool these two sources (Bob and Dick, with the latter treated as a 95% normal regression interval) to form a 50% interval.
- (b) Compare your results in this setting to those obtained in #2 when both intervals were Cauchy. Do you get comparable results this time, or is your answer here much different than when both were Cauchy?