

Stat 446      Homework #3      Due: Monday, September 14, 2015.

1. (1pt) Exercise 3, page 62. You can assume all shelves are full and do not have to worry about books that are not on the shelves. That is, the librarian wants to estimate the books currently on the shelves that need rebinding.
2. (2.5pt) Exercise 6, part (b) only, pages 62-63.
3. (1pt) Exercise 10. page 63. Recall that ‘most precision’ is equivalent to saying ‘smallest variance’.
4. The top figure on the back of this page contains the locations of mines in a study region. The bottom figure contains the counts of the objects in each of the square sampling units (quadrats) in the grid in the top figure. The goal is to estimate the total number of mines in the region. A random sample without replacement of size  $n = 10$  was selected and is indicated by the circled units in the bottom figure.
  - (a) (1pt) What was the probability of selecting the sample that was observed?
  - (b) (.5pt) Find  $\hat{t}$  (the estimate of the population total).
  - (c) (1pt) Find the standard error of this estimate.
  - (d) (1pt) Provide a two-sided  $t$ -based confidence interval for the population total.
  - (e) (1pt) Interpret this confidence interval given the context of the problem.

**You are to return this page with your solutions to receive any credit.**

10	10	11	10	15	14	11	5	10	14
9	10	11	5	9	15	8	14	14	11
11	16	11	8	14	15	12	4	10	7
5	16	13	14	15	8	7	12	13	4
12	10	11	14	6	8	10	9	13	9
13	10	14	7	15	6	10	14	17	11
10	11	16	12	7	11	13	9	6	11
9	11	13	10	7	12	8	7	5	15
8	6	10	7	14	12	9	14	13	16
8	12	9	13	10	12	7	18	8	10