36-303: Sampling, Surveys & Society
HW06: Hand in on Blackboard Thu Apr 12, 2012

Reminders & Announcements: (dates corrected)

- Fri Apr 6:
  - Drafty draft final reports due 1 pdf or doc file per team - email or submit on Blackboard)
  - HW 05 due - Submit on Blackboard
- Thu Apr 12:
  - Midterm Review
  - HW 06 (last one!) due - Submit on Blackboard
- Tue Apr 17: Final Midterm Exam (in class; cumulative)
- Thu Apr 19: Carnival! No Class
- Apr 24, Apr 26: TBA
- May 1, 3: Final Project Presentations
- Fri May 4:
  - Final Papers due (1 pdf or doc file per group - email or submit on Blackboard)
  - Second set of Peer Evaluations due (1 email to me, per class member, containing peer evaluations for each member of your group, as attachments)
- May 9: Meeting of the Minds (for those participating)

Exercises to Turn In (there are 2 exercises):

1. **Taylor Series Variance Estimates.** An SRS without replacement of 25 households in a particular region of the city reveals the following data:

Number of persons in household	Number of households in SRS	Household income (in $)
1	3	48111 36582 38245
2	6	46246 50309 58373 58800 58244 36898
3	7	63274 60458 73379 61650 73983 60696 62211
4	7	67884 61633 88080 69376 68719 55496 77201
5 or more	2	92149 78404
Total	25	

   (a) Estimate the mean household income from this SRS, and give the standard error.

   (b) From US Census data, the distribution of household size in the region is known:

Number of persons in household	Percentage of Households
1	25.75
2	31.17
3	17.50
4	15.58
5 or more	10.00

Using the household sizes as post-strata, compute post-stratum weights to make the sample more representative of the population, and compute the weighted average household income.

(c) Use the Taylor Series method discussed in class to compute a standard error for your weighted estimate in part (b). Compare to the standard error you computed in part (a).

2. **Jackknife Variance Estimates.** Use the jackknife method discussed in class to compute a standard error for the weighted estimate in problem 1(b). Compare to the standard errors you calculated in problems 1(a) and 1(c).

Notes on #1 and #2 : The sample size $n = 25$ is small enough that you can do all the computations "by hand" using Minitab, R, Excel, etc. If you know R and you want to compare your answers with the results you get from the R functions I introduced in class, please feel free to do so.