

# Project #2

**Due:** February 6, 2016

Winston Churchill (1874-1965):

Continuous effort - not strength or intelligence - is the key to unlocking our potential.

1. Do exercise 7.29.
2. Do exercise 7.33.
3. Do exercise 7.39. The answers to these are in the back of the book. So prove these answers, provide justification for each step of your reasoning.
4. Do exercise 8.1.
5. Do exercise 8.6.
6. Do exercise 8.8.
7. Do exercise 8.13. The answer to 8.13b is in the back of the book. So prove your answer, provide justification for each step.
8. Do exercise 8.26 using an error in estimation corresponding to a probability (confidence level) of .95. In part (a), give a 95% confidence interval for the true proportion  $p$ .
9. Do exercise 8.48. In part (b), compute a centered confidence interval (i.e. put equal probability in each tail).
10. Do exercise 8.129.
11. Let  $X_1, \dots, X_n$  be a SRS from  $N(\mu, \sigma^2)$  where  $\sigma$  is known. Let  $\theta$  be the 75<sup>th</sup> percentile of  $N(\mu, \sigma^2)$ .
  - (a) Give  $\hat{\theta}$ , an unbiased estimator for  $\theta$ .
  - (b) Find  $Var(\hat{\theta})$ .
  - (c) Give a 90% confidence interval for  $\theta$ .

## Other practice problems:

**Chapter 7:** 9, 11, 15, 17\*, 18\*, 19\*, 21\*, 23\*, 25\*, 27\*, 43, 51, 53, 73, 75

**Chapter 8:** 2, 3, 17, 23, 40, 41, 42, 43

\* Use R.