Investigation 5: Volunteering for charity? (assigned on Tues Nov 3; due on Mon Nov 9)
You may work with in a group of as many as three students on this assignment, handing in one report with all names, provided that you all contribute to the work. Word-processed reports are preferred to hand-written ones. Integrate computer output into your report as appropriate.

The 2004 General Social Survey asked a random sample of 1337 adult Americans whether they had performed volunteer work for a charity in the previous 12 months, and 657 people responded “yes.”

a) Determine (by hand) a 95% confidence interval for the population proportion who had performed volunteer work for a charity in the previous 12 months. Report the midpoint and margin-of-error, as well as the interval itself. Also check whether the technical conditions for this procedure are satisfied.

b) Interpret what this confidence interval reveals.

c) Produce a 99% confidence interval (feel free to use Minitab or the Theory-Based Inference applet), and comment on how it compares to the 95% one.

d) Determine how large the sample would need to be in order for a 95% confidence interval to have a margin-of-error of .015.

e) Conduct a hypothesis test of whether the population proportion of adult Americans who had performed volunteer work for a charity in the previous 12 months differs from .5. Report the hypotheses, test statistic, and p-value, along with a check of technical conditions. Also indicate your test decision at the .05 significance level.

f) Is your test decision consistent with your confidence interval? Explain how you check this.

The survey also found that 249 of the 1337 respondents said that they performed volunteer work for a charity at least once per month.

g) Determine and interpret a 90% confidence interval based on this result.

h) Conduct a hypothesis test of whether the sample data provide strong evidence that more than one-sixth of adult Americans perform volunteer work for charity at least once per month. Report the hypotheses, test statistic, and p-value, along with a check of technical conditions. Also summarize your conclusion.