HW2: Which tire? (assigned on Mon Jan 12; due on Wed Jan 14)
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.

A legendary story on college campuses concerns two students who miss a chemistry exam because of excessive partying but blame their absence on a flat tire. The professor allowed them to take a make-up exam, and he sent them to separate rooms to take it. The first question, worth five points, was quite easy. The second question, worth ninety-five points, asked: Which tire was it? I asked students in our class to indicate which tire they would pick. Before collecting the data, I predicted that the right front tire would be chosen more often than random chance would expect.

a) Describe (in words) the parameter of interest in this study. Also indicate the symbol used for this parameter.

b) State the null hypothesis to be tested, both in symbols and in words.

c) State the alternative hypothesis to be tested, both in symbols and in words.

The sample results in our class were that among the 37 students in class, 13 students selected the right front tire.

d) What proportion of students in class selected the right front tire? Is this a parameter or a statistic? Also indicate the symbol used for this value.

e) Use the One-Proportion Inference applet to conduct a simulation (using at least 1000 repetitions), addressing the question of whether the observed class data provide strong evidence in support of the conjecture that the right front tire is selected more often than random chance would expect. Specify the 3 input values for the applet that you use. Also submit a print-out of the applet output, and indicate where the observed result falls in that distribution.

f) Report the approximate p-value from this simulation analysis. Also write a sentence or two describing what this approximate p-value means.

g) Would you reject the null hypothesis at the .05 significance level? Explain.

h) Write a paragraph, as if to students not in our class, describing what your simulation analysis reveals about whether the observed class data provide strong evidence in support of the conjecture that the right front tire is selected more often than random chance would expect. Be sure to explain the reasoning process behind your conclusion.
i) Now suppose that we had had twice as many students in class that day, with twice as many selecting the right front tire. Re-conduct the simulation analysis, and comment on how your conclusion changes (if at all).