Project 5 **Math 222**
Resampling **Due Friday, April 22**

1. Nurses in an inner-city hospital were unknowingly observed on their use of latex gloves during procedures for which glove use is recommended. The nurses then attended a presentation on the importance of glove use. One month after the presentation, the same nurses were observed again. Here are the proportions of procedures for which each nurse wore gloves:

Nurse	Before	After
1	0.50000	0.85700
2	0.50000	0.83300
3	1.00000	1.00000
4	0.00000	1.00000
5	0.00000	1.00000
6	0.00000	1.00000
7	1.00000	1.00000
8	0.00000	1.00000
9	0.00000	0.66700
10	0.16700	1.00000
11	0.00000	0.75000
12	0.00000	1.00000
13	0.00000	1.00000
14	1.00000	1.00000

   (a) Write a short paragraph to answer the following questions: Why is a one-sided alternative proper here? Why must matched pairs methods be used?

   (b) Make a histogram showing the increase in the proportion of procedures where gloves where used after the presentation. Does this histogram suggest that a matched pairs t-test would be appropriate? Explain.

   (c) Do a permutation test for the difference in means. Does the test indicate that the presentation was helpful?

   (d) If you are mainly interested in whether or not the effect of the intervention is significant at the 5% level, an alternative approach is to give a bootstrap confidence interval for the mean difference within pairs. If zero (no difference) falls outside the interval, the result is significant. Do this and report your conclusion.

   (e) Compare your answers from parts (c) and (d) with the corresponding results from using a classical t-test and t-distribution confidence interval with this data. Are the results similar or different? If they are different, what accounts for the difference?