Math 159
Nonparametric Analysis
Spring 2010
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HW2: Section 3.1

HOMEWORK THOUGHTS: A large part of this course is learning how to interpret and communicate results. That is, an isolated p-value will not ever be a complete answer to a question. As stated below, please always explain your answers in a sentence or two (unless, of course, the problem is truly just computational).

1. Section 1.4: 2def
2. Section 2.2: 3b
3. Section 3.1: 1, 2, 7, 10
4. KISSING THE RIGHT WAY Most people are right-handed and even the right eye is dominant for most people. Molecular biologists have suggested that late-stage human embryos tend to turn their heads to the right. German biopsychologist Onur Güntürkün (2003) conjectured that this tendency to turn to the right manifests itself in other ways as well, so he studied kissing couples to see if both people tended to lean to their right more often than to their left. He and his researchers observed couples from age 13 to 70 in public places such as airports, train stations, beaches, and parks in the US, Germany, and Turkey. They were careful not to include couples who were holding objects such as luggage that might have affected which direction they turned. In total, 124 kissing pairs were observed, 80 of whom turned to the right.

   Dr. Güntürkün noted that about 2/3 of people have a dominant right foot, or eye, and conjectured that people would exhibit a similar tendency of "right-sidedness" when kissing.

   (a) To what population might you infer your results?
   (b) Given that this is the "binomial" section of the course... do you think the binomial distribution is appropriate to use here? Explain.
   (c) Using both exact binomial inference and the normal approximation, test Dr. Güntürkün's conjecture.
   (d) Using both an exact binomial (i.e., trial-and-error in R) approach and the normal approximation, find a 95% confidence interval for the true proportion of people who kiss to the right.
   (e) Using your answers to (a), (c), and (d), write a few sentences summarizing the results of the study.