Math 324 Fall 2004
Assignment 6
Due: Dec 8, 2004

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The aim of this assignment is for you to compute confidence intervals and carry out hypothesis testing using routines built in, or code you develop, in your chosen statistical software. **Note: No late assignments will be accepted under any circumstances.**

You should submit your solutions to this assignment as a written report. In other words, it is not enough to submit pages of computer output with no interpretation. If you wish to submit your analysis code, please attach it as an appendix to your report. As this is the fifth assignment you are expected to take more care in the write-up. For example, properly label plots, write clear paragraphs describing the results of your analysis and at the end of your report write a brief conclusion summarizing the main results.

Random dot stereograms

The dataset given on the website contains results from an experiment in visual perception using random dot sterograms (you may attempt to see these images on the website).A random dot sterogram consists of two images. Both images appear to be composed entirely of random dots. However, they are constructed so that a 3D image (of a diamond) will be seen, if the images are viewed with a stereo viewer, causing the separate images to fuse. Another way to fuse the images is to fixate on a point between them and defocus they eyes, but this technique takes some effort and practice.

An experiment was performed to determine whether knowledge of the form of the embedded image affected the time required for subjects to fuse the images. One group of subjects (group NV) received either no information or just verbal information about the shape of the embedded object. A second group (group VV) received both verbal information and visual information (e.g., a drawing of the object).

For this assignment at a minimum you should

1. Boxplot the Fusion times by group. Comment on your plot.

2. Transform the fusion times (eg take a log transform). Repeat the previous boxplot. What do you observe? Why might you take this transformation? Use the transformed data for the rest of the assignment

3. Give a 95% confidence interval for the difference in fusion times between the two groups.

4. Carry out an appropriate hypothesis test to check the difference in fusion time between the two groups. Be sure to report your conclusion.