

Applied and Mathematical Statistics

Homework Four



Figure 1: Hippos. Figure source: Paul Maritz, http://en.wikipedia.org/wiki/File:Hippo_pod_edit.jpg.

Please do these problems before class on Thursday. These are not meant to be long calculations. Use R for all your work.

1. Jackie and Doreen spend a weekend measuring the mass of rocks. Each goes to a different stream and measures 100 rocks. The data from their weekend escapades are in the file `rocks.dat`, available on the course webpage.
 - (a) Determine the mean rock size for each sample (Jackie's and Doreen's).
 - (b) Determine a 95% confidence interval for your estimates of the mean.
 - (c) Plot histograms of Jackie's and Doreen's data.
 - (d) Do you think that the means of the populations that Jackie and Doreen were sampling from are the same? Answer this question with appropriate t and Wilcoxon tests and interpret your results.
2. You are investigating the effects of a certain diet pill on hippos. Fifty hippos take the pill daily for two weeks. You weigh each hippo in your study before they begin taking the pill and then again after they have taken the pills for two weeks. The data from this experiment are found in the file `hippo.dat` on the course homepage.
 - (a) Determine the mean weight of the hippos before and after the regimen of pills
 - (b) Determine a 95% confidence interval for your estimates of the mean.
 - (c) Plot histograms of the hippo weights before and after taking the pills.
 - (d) Have the hippos in the study lost weight? Are their weights significantly different from before? Answer this question with appropriate t and Wilcoxon tests and interpret your results.