Computer Project 2

(Due on 12/2/2009, Wed)

Instructions: The most useful reference for this project is the R handout, `chp3-two-sample.R`. Remember to interpret every result presented in the report. Also, provide the R codes in an appendix.

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1. (*Two-Sample Inference on Location*) Consider the `sleep` dataset available in R, which show the effect of two soporific drugs (increase in hours of sleep compared to control) on 10 patients. There are 20 observations on 2 variables

   - `extra` numeric increase in hours of sleep
   - `group` factor drug given

   Use R commend `?sleep` to see more details on this dataset.

   a. Compare the increased sleep time between the two treatment groups using both Wilcoxon rank sum test and the permutation test. Report the exact or asymptotic p-values.
   b. Construct a 95% confidence interval for the difference in mean increased sleep time between the two groups. Provide the parametric t CI, parametric and nonparametric bootstrap CIs and compare.
   c. Compare their CDFs using both the Smirnov and Cramer-von Mises tests.

2. (*Two-Sample Inference on Variation*) A blood bank kept a record of the rate of heartbeats for several blood donors.

Men	58	76	82	74	79	65	74	86	
Women	66	74	69	76	72	73	75	67	68

   It has been hypothesized that the variation among the men is significantly greater than the variation among the women. Conduct the Siegel-Tukey, permutation, and nonparametric tests to assess the research hypothesis.