PSYC 7710 Lab

Lab 8 Activity

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Directions:

A. Answer the following questions and save the code you used in an R script.
B. You have until the end of lab to complete.
C. Set the seed at 42 before **EACH** random draw.

Questions:

1. Simulate 2 standardized vectors of data with size 50 from a multivariate normal distribution. The two vectors should have a correlation value of .300. Name the data *my_cor_data*.
2. Run a permutation test on the correlation between the two vectors in *my_cor_data*. Report the *p*-value, plot the null distribution as a histogram, and overlay the histogram with a vertical line indicating the observed correlation value.
3. Simulate 2 vectors of data with size 50 from a univariate normal distribution. The first vector should have a mean value of 5, the second vector should have a mean value of 4, and both vectors should have a standard deviation of 2. Concatenate the two vectors and assign them to group 1 and group 2. Name the data *my_group_mean_data*.
4. Run a permutation test on the mean difference between the two groups in *my_group_mean_data*. Report the *p*-value, plot the null distribution as a histogram, and overlay the histogram with a vertical line indicating the observed mean difference value.
5. Use the *lm* base R function to estimate the test statistics from questions 2 and 4. Which *p*-value is lower for both statistics, the *lm* function or the permutation tests? How close are the *p*-values across both methods for each statistic?