The purpose of this assignment is to understand the basics of statistical significance testing. We are interested in analyzing given datasets and performing T, Analysis of Variance (ANOVA) and Multivariate analysis of variance (MANOVA) tests. Please use the R programming language for this assignment.

Tasks

Imagine that you are conducting user studies to evaluate several types of menus for their performance on navigating. Here, please compute ANOVA and pairwise-t-test for each scenario.

1. The first dataset contains user id, type of menu and time. There are a total of 40 users, 10 each for a particular menu type. So, there are 4 groups of users and it's a between-group design.
    ANOVA (**20pts**, grading will be based on a test dataset)
    Pairwise-t-test (**20pts**, grading will be based on a test dataset)
2. Second dataset user id, type of menu, error and time. There are a total of 10 users, each user testing each menu type. It's a with-in subject design.
    MANOVA (**20pts**, grading will be based on a test dataset)
    Pairwise-t-test (**20pts**, grading will be based on a test dataset)
3. Write a report on what insights you gained from the data after performing the tests. You can go through HCI research papers, especially CHI papers, to get an idea of how results are reported. (**20pts**)

Bonus

1. Visualization (**5pts**): For each scenario, you need to report your results using graphs. For this part, you can use any kind of graph plotter in R or Python. It can be any relevant plot that visualizes data points, mean, sd, etc.
2. Writing for Visualization (**5pts**): Please follow the conventional way of analyzing visualizations in the CHI community.

Submission

This is an individual assignment. The due date is 11/21, i.e., 2 weeks later.

Along with the code, you have to submit your .zip file through blackboard, please name your zip file as LastName_FirstName_SBUID_hw2.zip, which includes:

LastName_FirstName_SBUID_hw2
    |---vis.ipynb (if visualizing your results by Python)
    |---q1.r
    |---q2.r
    |---report.pdf

Don't submit rar instead of zip.