CSE 518 HW 3: ANOVA and pairwise t-test

Due: Tuesday, Dec 1st, 2020 at 11:59 PM

The purpose of this assignment is to understand the basics of statistical significance testing. We are interested in analyzing given datasets and performing pairwise t-test, Analysis of Variance (ANOVA). Please use the Python or R programming language for this assignment. Use standard libraries.

**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 **task completion time**. There are a total of 40 users, 10 each for a particular menu type. So, there are 4 groups of users and it is a **between-group** design.
    a. ANOVA (**20pts**, grading will be based on a test dataset)
    b. Pairwise-t-test : Simplification – no Adjustment (**20pts**, grading will be based on a test dataset)
2. Second dataset **user id, type of menu, task completion time**. There are a total of 10 users, each user testing each menu type. It's a **within-subject** design.
    a. ANOVA (**20pts**, grading will be based on a test dataset)

Note : There are typically three types of pairwise t-tests:
(1) pairwise t-test without adjustment ( **`p.adj = "none" in R)`**
(2) pairwise t-test with bonferroni adjustment, (**`p.adj = "bonf" in R)`**
(3) pairwise t-test with holm adjustment (**`p.adj = "holm" in R)`**.
The (1) is the simplest. You should use the approach (1) in this homework.

b. Pairwise-t-test : Simplification – no Adjustment (**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 from the conference CHI 2018-2020, to get an idea of how results are reported in this field. (**20pts**)

**Bonus Points :**

1. Visualization (**10pts**): For each scenario, you need to report your results using graphs.

   For this part, you can use any kind of graph plotting library in Python. It should be relevant

   plot that visualizes data points, mean, sd, etc.

2. Writing for Visualization (**10pts**): Please follow the conventions used for analyzing visualizations in the CHI community.

**Submission**

This is an individual assignment. The due date is December 1st, 2020 at 11:59PM EST.

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Along with the code, you have to submit your .zip file through blackboard, please name your zip file as SBUID_hw3.zip, which includes the folder :

SBUID_hw3/

|---vis.ipynb (if visualizing your results by Python)

|---q1.r OR q1.py

|---q2.r OR q1.py

|---report.pdf

Don’t submit .rar instead of .zip

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