Exam 1.

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1) What are T scores**? 5 points**

**T scores are ratios between two groups and the difference between them.**

**The larger the score, the groups more different**

**The smaller the score, the groups are more similar**

2) Give one example where you apply Paired T Test**? 5 points**

**The max vertical jump of college basketball players is measured before and after participating in a training program.**

3) What is statistical significance? **5 points**

**Statistical significance is used to identify whether observations could have occurred under the null hypothesis of a statistical test. It also depends on the value set by the researcher. For a test to be statistically significant it had to be less than the set threshold.**

4) What is the difference between a one-sample t-test and a paired t-test? **5 points**

**One sample t-test has one group tested to compare to a known mean; whereas a paired t-test compares means from a group at different time periods.**

5) What is a factorial ANOVA? **5 points**

**Factorial ANOVA is a type of ANOVA that uses more than one independent variable**

6) What are assumptions of factorial ANOVA? **5 points**

**Assumptions of factorial ANOVA are:**

* **There is no difference in the average of the independent variable between the two groups**
* **The independent variable average is different for at least one group**

7) What is the R function for **One way ANOVA? 5 points**

**anova\_one\_way <- aov(time~poison, data = df)**

**summary(anova\_one\_way)**

**8) What does correlation coefficient tell you? 5 points**

**Correlation coefficients (-1 to 1) tell you the direction of the relationship, meaning a positive value indicates all the variables change in the same direction and a negative value indicates that the variables change in opposite directions.**

9) **What are the assumptions of the Pearson correlation coefficient**? **5 points**

**Assumptions of the Pearson correlation coefficient are:**

* **Both variables are on a ratio level of measurement**
* **Data must follow normal distributions**
* **No outliers in data**
* **Data must be random**
* **Linear relationship formed between two variables**

10) What are the main assumptions of T-test? **5 points**

**The assumptions of t-tests are:**

* **Data is normally distributed**
* **Compare groups with similar variance**
* **Data must be independent**

**11) Calculate Paired T Test with R: 50 points**

**Using** following 2 variables, calculate P value, and distribution plot.

x = c(1000,230,12333,3455,23,12,3,4,45,56,78)

y = c(1,2,3,4,5,6,7,8,9,10,11)

Email R program Exam1.R and Exam1.pdf plot to get full points.

Upload Exam1.R and Exam1.pdf plot to your Git repository.