**Practice Final: First Part (Non-Analysis Question) (45 pts)**

Note: Every final is different… this does not mean the questions on your final will look the same. The final exam is aimed at testing concepts and those can be tested from varying types and numbers of questions. With that said, this could have been a final exam in our class (all of these questions were on a final at one time or another).

1. True / False. Simply highlight your answer. (2pts each)

* 1. T / F For a two independent sample t-test, If we decrease alpha the power increases.
  2. T / F The 2 Sample T-Test is resistant to outliers.
  3. T / F A Rank-Sum test is a good test to use with censored data.
  4. T / F For a fixed , the quantile will never be greater than the quantile , no matter the degrees of freedom.
  5. T / F For a two-sided, two sample t-tools pooled confidence interval for the difference in means (µ1-µ2), if both ends of the confidence interval are positive, that is evidence that µ1 > µ2
  6. T / F The MSE in an ANOVA is the pooled estimate of the variance for the assumed normal distributions of the variable for each group in the study.
  7. T / F We wish to test the equality of 3 group means, if the normality assumption is met, the ANOVA is robust to the standard deviation assumption as long as the sample sizes of the groups are the same.
  8. T / F In general, in an observational study the result cannot be generalized to the population the sample is taken from.

1. (5 pts) Define the Pvalue:
2. (7 pts) Describe the strategy of the 6-step hypothesis test.
3. For question 4, consider the output from the Barbie Bungee Below ☺

|  |  |
| --- | --- |
| **proc** **glm** data = Barbie;  model distance = bands / solution;  **run**; | **proc** **glm** data = Barbie;  class bands;  model distance = bands / solution;  **run**; |
| Table  Description automatically generated  Diagram  Description automatically generated | Graphical user interface, table  Description automatically generated  Chart  Description automatically generated |

1. (5 pts) We would like to conduct a lack of fit test with respect to the simple linear regression fit of the distance bungeed to the number of rubber bands. Please fill in the ANOVA table below and **provide a conclusion**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Source | DF | SS | MS | F | P-value |
|  |  |  |  |  |  |
|  |  |  |  |  |  |
|  |  |  |  |  |  |

1. (6 pts) Show the associated 6 step hypothesis test for the slope of the bands variable from the parameter estimate table in the simple linear regression fit above (the first column).
2. (3pts) Find (show your work) and interpret a 95% confidence interval for the “bands” variable’s slope from b.
3. (3 pts) With respect to the last problem, let’s say that Ver 3 and Ver 4 used video content while Ver 1 and Ver 2 did not. You would thus like to compare the average of the click rates of Version 3 and 4 with the Original but you are assuming the standard deviations to all be the same so you would like to include Ver 1 and Ver 2 in the estimation of the standard deviation. What are the contrast weights that would be used to test the hypothesis:

Assume the order of the groups is alphabetical: “Original Version”, “Ver 1”, “Ver 2”, “Ver 3”, “Ver 4”

Assume the data is contained in a dataset called ***WebsiteTest***, the groups are in a variable called ***WebsiteType*** and the click rates are in a variable called ***ClickRate***. Simply finish the code below to perform the desired contrast. Place your additional code in place of the green placeholders.