1. The department chair wanted to compare the final examination percentage (**Final Score**: measured in %) of introductory statistics students between two new instructors (Dr. Jekyll and Mr. Hyde). A random sample of 32 students was drawn in Dr. Jekyll’s class and the average final score was 71.1% and a standard deviation of 7.6%. A random sample of 24 students was drawn in Mr. Hyde’s class and the average final score was 67.2% and a standard deviation of 9.0%. It is reasonable to assume that the Final Score follows a Normal distribution, and that the equal variance assumption is valid.
2. Provide a description of the parameter of interest. **[2 marks]**
3. Set up the null hypothesis and the alternative hypothesis. **[2 marks]**
4. Can we safely assume the “equal variance” assumption if valid? Briefly justify your answer. **[0+2 marks]**
5. Calculate the test statistic and find the p-value. **[4 marks]**
6. Draw an appropriate conclusion with 1% significance level. **[2 marks]**
7. A subscription-based e-commerce company wanted to test if the new version of the product browsing page (Version 2) will generate higher sales (in dollars) compared to the current version (Version 1). A random sample of 50 customers were randomly assigned to the two versions during a 7-day period. The results are summarized in the data “SalesComparison01.xlsx”. Use R function “t.test()” to answer the following questions.
8. Suppose we want to see if the current version (Version 1) generates sales less than $50. Use t.test() to generate the results and make an appropriate conclusion. Use . **[2+4 marks]**
9. Suppose we want to see if the new version (Version 2) generates more sales than the current version (Version 1). Can we safely make the assumption that the equal variance assumption is valid? Use t.test() to generate the results and make an appropriate conclusion. Use . **[2+2+4 marks]**