Statistics with Minitab
Lab 2

1. **Two independent samples t-test (use Data 2)**

   Stat>Basic Statistics>2-Sample t-Test

   Perform a hypothesis test about the average weekly number of hours of television viewing for men and women using the `tvhours` data (grouped by the variable `sex`, male or female)

   (a) What is the mean for the men? ________. For women? ________.

   (b) What are the null and alternative hypotheses for this test? ________________

   (c) What is the 95% confidence interval in the output? (__________, __________). This is the 95% confidence interval for what? ________________

   (d) What do you conclude from this data about the television viewing habits of men and women? Explain how the \( t \)-test supports your conclusion.

   ________________________________________________________.

2. **Goodness of fit \( \chi^2 \)-test (use Data 1)**

   Stat>Quality Tools>Individual Distribution Identification

   (a) Perform a goodness-of-fit test to determine whether the HRA (heart rate) data are normally distributed. Use the \( \alpha = 0.01 \) significance level.

   \( P \)-value ________ Conclusion ____________________________

   (b) Perform a goodness-of-fit test to determine whether the SYS (systolic blood pressure) data are normally distributed. Use the \( \alpha = 0.05 \) significance level.

   \( P \)-value ________ Conclusion ____________________________

3. **Contingency tables \( \chi^2 \)-test (use Data 3)**

   Stat>Tables>Chi-Square Test for Association

   Use contingency tables and the chi-square distribution to test for the independence of the categorical variables `agecat` (categories 1, 2, 3, 4, 5) and `degree` (categories 1, 2, 3).

   (a) What are the null and alternative hypotheses for this test? ________________

   (b) How many people in the Age Category 3 reported that they are in Happiness Category 1?

   (c) What is the expected number of people in Age Category 3 that they are in Happiness Category 1? ________________

   (d) How many degrees of freedom for this test? ________________ . What is the Pearson chi-square value? ________________

   (e) What does the chi-square test on these data tell us about the relationship between age and happiness? Explain.