Correlation Analysis   Name

Part 1: Correlation Study for Categorical Variables

Objective: to test whether there is statistically significant **correlation between gender and daily hours of TV viewing**. Answer the following questions for the data used in Assignment 3.

Answer the following questions:

1. State the statistical hypotheses.

    Null hypothesis, H_0: **There is no association between gender and daily hours of TV viewing.**

    Alternative hypothesis, H_a: **There is a significant association between gender and daily hours of TV viewing.**

2. Perform a Chi-square test using SPSS (or other software that you have) and report the p-value for the Pearson's Chi-square test. P-value : **.356**

3. Use SPSS output on chi-square test to conclude your analysis and, at 5% level of significance, comment on whether statistically there is statistical significant correlation between gender and daily hours of TV viewing.

    Because the p-value is not less than 0.05, we do not reject the null hypothesis. This shows that, statistically, there is no significant correlation between gender and daily hours of TV viewing.

To perform the chi-square test, in SPSS main menu, click the following menu selections:
Analyze $\Rightarrow$ Descriptive Statistics $\Rightarrow$ Crosstab …, and then select the variables to put in the row and column variable boxes, and check the Statistics button for selecting statistics options, check chi-square box for doing chi-square test.

Reference:
*   SPSS video for chi-square test on WebCT, **Video for Chi-square Test of Independence for Un-organized Data** for instruction.
*   Exploratory Data Analysis instruction pages 7 and 8 for instructions on how to run chi-square test.

Part 2: Correlation Between Two Quantitative Variables

Objective: to test whether there is statistically significant **correlation between weight and height**. Answer the following questions for the data used in Assignment 3.

Things to include in your analysis report: Your report should consist of three sections:

1. Make a scatter plot to examine the correlation between the two quantitative variables **weight** and **height**, (See Exploratory Data Analysis instruction pages 5 and 6 for instructions on how to produce scatter plot.) and write few sentences to describe the correlation between the two variables such as the strength and direction of the correlation.
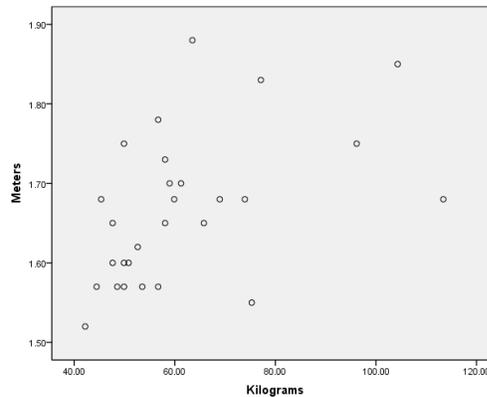
There is correlation between height (meters) and weight (kilograms) in the scatter plot above. As height (meter) increases, most of the weight (kilogram) also increases. From the scatter plot, we can conclude that there is positive correlation between the two variables.

2. Report the Pearson's correlation coefficient between the two quantitative variables **weight** and **height** and the p-value from testing whether the correlation is significantly different from zero and 5% level of significant. The SPSS video instruction for test of correlation is at the following link: http://people.ysu.edu/~gchang/SPSS/Correlation.html

   1) Pearson's correlation coefficient (in SPSS output): **.489**

   2) *p*-value for testing zero correlation (in SPSS output): **.008**

   3) State the null and alternative hypotheses for testing zero correlation and use the *p*-value to conclude the test of zero correlation.

   H_0: **p=0 This null hypothesis means that there is no correlation between the variables of height(meters) and weight(kilograms)**

   H_a: **p≠0 This alternative hypothesis means that there is a significant correlation between the variables of height (meters) and weight (kilograms).**

   Conclusion: **Because the p value .008 is less than .05 we reject the null hypothesis. This states that there is a significant correlation between height and weight.**

To produce the Pearson's correlation coefficient and test for zero correlation, in SPSS main menu, click the following menu selections: **Analyze** $\Rightarrow$ **Correlate** $\Rightarrow$ **Bivariate ...**, and then select the variables to put in the variable box for calculating the correlation coefficients and tests.