

Chapter 23: Chi-Square Test of Association in Minitab 17

All the appropriate menu items are under Stat > Tables. Which to choose depends on how your data is provided. For every problem in the textbook, the data is provided summarized into a two-way table. **For this, you must use Stat > Tables > Chi-Squared Test for Association.**

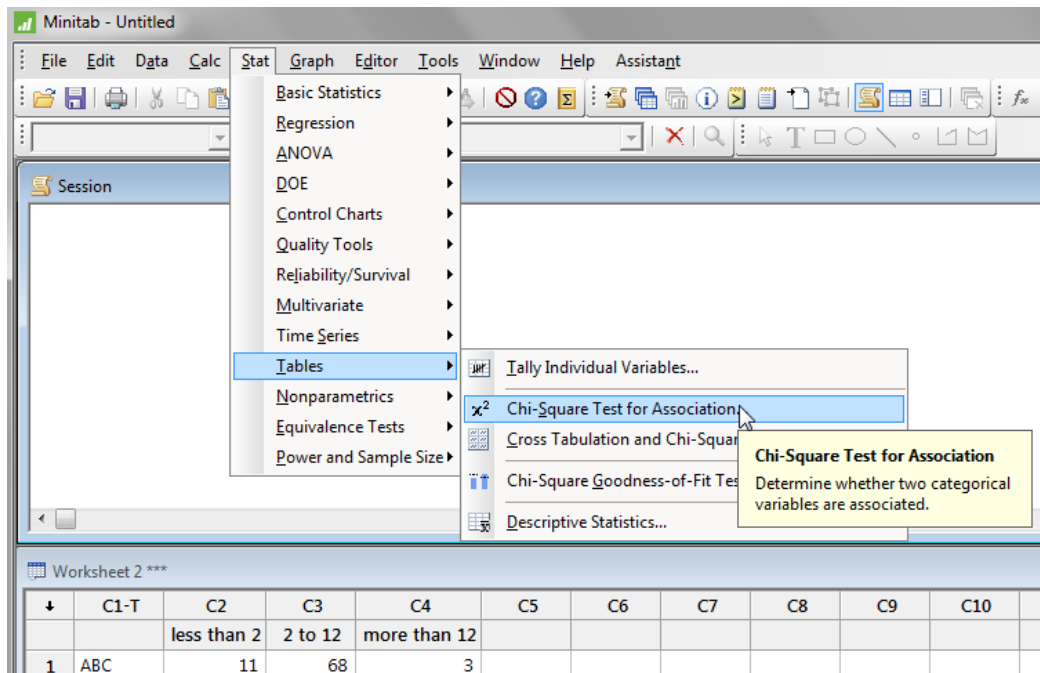
To use Minitab to analyze these, YOU MUST TYPE IN the summary table into the Minitab worksheet as shown below. Notice that the TOTALS ARE NOT INCLUDED when you type it in.

Example: Is there a relationship between the number of hours per week a high school student spends on extracurricular activities and their academic performance? (Academic performance was split into two categories (the rows) and their time spent on extracurricular activities split into three categories (the columns.))

Here’s the data as it should be typed into the Minitab worksheet – WITHOUT totals.

	C1-T	C2	C3	C4	C5
		less than 2	2 to 12	more than 12	
1	ABC	11	68	3	
2	DF	9	23	5	
3					

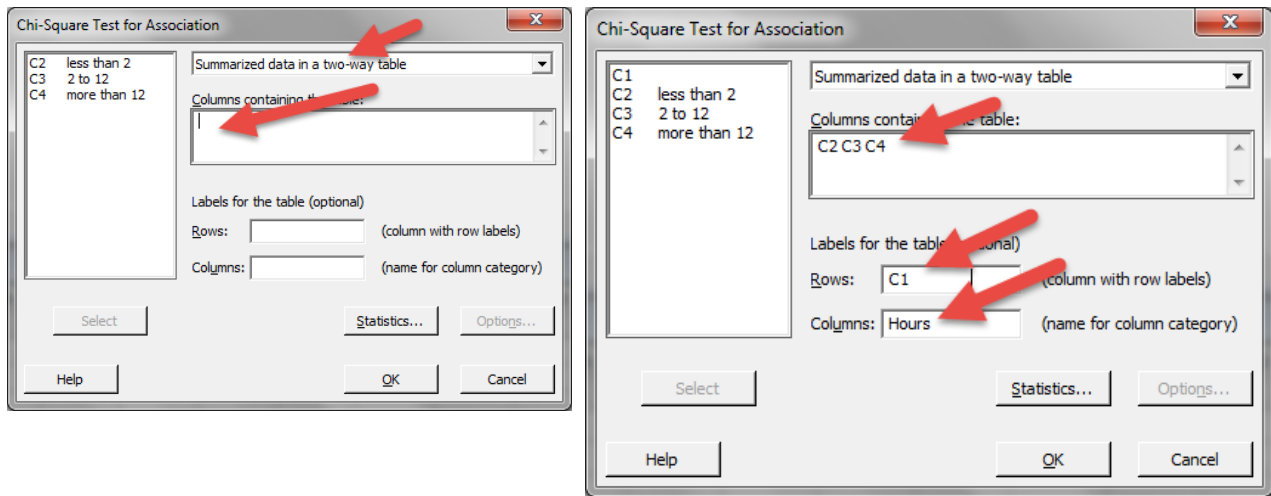
Use the menu item and fill in which columns to use for the table and the labels.



We will test:

Ho: no relationship between number of hours of extracurricular activities and academic performance.

Ha: There is a relationship between the number of hours of extracurricular activities and academic performance.



See the output on the right here.

The test we learned to use is the Pearson's Chi-Square test.

The p-value for these data is 0.031

There is another acceptable test for these hypotheses, called the Likelihood Ratio Chi-Square Test. Minitab gives output for that test as well. It is marked out here to indicate that you are to disregard that in this class.

Results for: Worksheet 2

Chi-Square Test for Association: C1, Hours

Rows: C1 Columns: Hours

	less than 2	2 to 12	more than 12	All
ABC	11	68	3	82
DF	9	23	5	37
All	20	91	8	119

Cell Contents: Count
Expected count

Pearson Chi-Square = 6.926, DF = 2, P-Value = 0.031
Likelihood Ratio Chi-Square = 6.520, DF = 2, P-Value = 0.038

* NOTE * 1 cells with expected counts less than 5

One reason for requiring students to use professional statistical software, such as Minitab, in this course, is to illustrate that there often are multiple acceptable statistical tests for a certain type of question.