

Chapter 500

Frequency Tables

Introduction

This procedure produces tables of frequency counts and percentages for categorical and continuous variables. This procedure serves as a summary reporting tool and is often used to analyze survey data. This procedure also calculates the **multinomial chi-square** test.

Frequency Tables

Frequency tables are generally produced on individual variables. For categorical data, the table records the number of observations (the frequency) for each unique value of the variable. For continuous data, you must specify a set of intervals (or bins). The frequency table records the number of observations falling in each interval. Frequency tables are useful for analyzing categorical data and for screening data for data entry errors.

Types of Categorical Variables

Note that we will refer to two types of categorical variables: *Categorical* and *Grouping or Break*. *Grouping* variables are used to split a database into subgroups. A separate set of reports is generated for each unique set of values of the *Grouping* variables. The values of a *Categorical* variable are used to define the rows of the frequency table.

Data Structure

The data below are a subset of the real estate sales (**Resale**) dataset provided with the software. This data gives the selling price, the number of bedrooms, the total square footage (finished and unfinished), and the size of the lots for 150 residential properties sold during the last four months in two states. Only the first 8 of the 150 observations are displayed.

Resale dataset (subset)

State	Price	Bedrooms	TotalSqft	LotSize
Nev	260000	2	2042	10173
Nev	66900	3	1392	13069
Vir	127900	2	1792	7065
Nev	181900	3	2645	8484
Nev	262100	2	2613	8355

Missing Values

Missing values may be ignored or included in the table's counts and percentages.

Procedure Options

This section describes the options available in this procedure. To find out more about using a procedure, turn to the Procedures chapter.

Variables Tab

This panel specifies the variables or data that will be used in the analysis.

Type of Data Input

Select the source of the data to analyze. The choices are

- **Column(s) in the Database**

Data, titles, and labels will be read from the Data Table on the Data Window using the selected variable(s). Specify at least one variable to be used to create the frequency table. The unique values in each variable will form the rows of the tables. If more than one variable is specified, a separate frequency table will be generated for each of the variables. If requested, a combined table will be generated for all variables together.

Two types of variables may be specified: *Categorical Variables* and *Numeric Variables*. Usually, you will enter categorical variables.

1. **Categorical Variables**

Categorical variables may include text values (e.g. “Male, Female”) or index numbers (e.g. “1, 4, 7, 15” to represent 4 states). The numbers or categories may be ordinal (e.g. “Low, Medium, High” or “1, 2, 3, 4, 5” as in a Likert scale).

2. **Numeric Variables**

Since frequency tables display categorical data, all numeric variables with continuous data must be grouped into categories by the procedure using user-specified rules before the table is created. To enter this type of variable, you must first put a check by *Create Other Categorical Variables from Numeric Data* to display the numeric variable entry box. You can specify groups by entering the numeric boundaries directly (e.g. “Under 21, 21 to 55, and Over 55”) or by entering the number of intervals to create, the minimum boundary, and/or the interval width. You can only specify a single grouping rule that will be used for all numeric variables. If you have more than one numeric variable, you should group the data directly on the dataset using a Recode Transformation and enter the resulting variables as a categorical variable.

- **Table of Counts**

Summarized count data, titles, and labels will be read directly from a table on this input window.

Frequency Table Variables (*Database Input*)

Categorical Variables

Specify one or more categorical variables for use in table columns. Each unique value in each variable will result in a separate column in the table. The data values themselves may be text (e.g. “Low, Med, High”) or numeric (e.g. “1, 2, 3”), but the data as a whole should be categorical. If more than one variable is entered, a separate frequency table will be created for each variable.

The data values in each variable will be sorted alpha-numerically before the table columns are created. If you want the values to be displayed in a different order, specify a custom value order for the data variable using the *Column Info Table* on the *Data Window*.

Frequency Tables

Create Other Categorical Variables from Numeric Data

Check this box to create tables with columns from numeric data. When checked, additional options will be displayed to specify how the numeric data will be classified into categorical variables.

If you choose to create categorical variables from numeric data, you do not have to enter a categorical variable in the input box above (but you can). If both numeric and categorical variables are entered, a separate table and analysis will be given for each variable.

Numeric Variable(s) to Group into Categories

Specify one or more variables that have only numeric values to be used in columns of the table. Numeric values from these variables will be combined into a set of categories using the categorization options that follow. If more than one variable is entered, a separate table will be created for each variable.

For example, suppose you want to tabulate a variable containing individual income values into four categories: "Below 10000", "10000 to 40000", "40000 to 80000", and "Over 80000". You could select the income variable here, set **Group Numeric Data Using** to "List of Interval Upper Limits" and set the **List** to "10000 40000 80000".

Group Numeric Data Using

Choose the method by which numeric data will be combined into categories for use in table columns.

The choices are:

- **Number of Intervals, Minimum, and/or Width**

This option allows you to specify the categories by entering any combination of the three parameters:

Number of Intervals

Minimum

Width

All three are optional.

Number of Intervals

This is the number of intervals into which the values of the numeric variables are categorized. If not enough intervals are specified to reach past the maximum data value, more will be added.

Range

Integer ≥ 2

Minimum

This value is used in conjunction with the Number of Intervals and Width values to construct a set of intervals into which the numeric variables are categorized. This is the minimum value of the first interval.

Range

This value must be less than the minimum data value.

Width

This value is used in conjunction with the Number of Intervals and Minimum values to construct a set of intervals into which the numeric variables are categorized. All intervals will have a width equal to this value. A data value X is in this interval if

$$\text{Lower Limit} < X \leq \text{Upper Limit}.$$

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- **List of Interval Upper Limits**

This option allows you to specify the categories for the numeric variable by entering a list of interval boundaries directly, separated by blanks or commas. An interval of the form $L1 < X \leq L2$ is generated for each interval. The actual number of intervals is one more than the number of items specified here.

For example, suppose you want to tabulate a variable containing individual income values into four categories: “Below 10000”, “10000 to 40000”, “40000 to 80000”, and “Over 80000”. You would set **List of Interval Upper Limits** to “10000 40000 80000”. Note that 10000 would be included in the “Below 10000” interval, but not the “10000 to 40000” interval. Also, 80000 would be included in the “40000 to 80000” interval, not the “Over 80000” interval.

Frequency (Count) Variable (*Database Input*)

Frequency Variable

This optional variable specifies the number of observations that each row represents. When omitted, each row represents a single observation. If your data is the result of previous summarization, you may want certain rows to represent several observations. Note that negative values are treated as a zero weight and are omitted. Fractional values may be used.

This option is used when you want to enter previously tabulated data for a multinomial test.

Grouping (Break) Variables (*Database Input*)

Number of Grouping Variables

Select the number of grouping (break) variables to include for the analysis. All reports and plots will be generated for each unique combination of the values of the grouping variables. You can select up to 8 grouping variables.

Grouping Variable

Select an optional categorical grouping (or break) variable. All tables, statistical reports, and plots will be generated for each unique value of this variable. If you specify more than one grouping variable, the tables, statistical reports, and plots will be generated for each unique combination of the values of the variables chosen.

Two-Way Table (*Table of Counts Input*)

Number of Categories (Rows) in the Table

Select the number of categories (or rows) in the table.

“All” or Blank

When “All” is entered or this option is left blank, you may enter up to 100 categories in the table. Only rows up to the last row with counts will be analyzed.

Number of Variables (Columns) in the Table

Select the number of variables (or columns) in the table. A separate frequency table and multinomial test is output for each variable. All variables are combined in the other tables and plots.

“All” or Blank

When “All” is entered or this option is left blank, you may enter up to 100 variables in the table. Only columns up to the last column with counts will be analyzed.

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Table of Counts

Enter variable titles, category labels, and counts directly into this table. Enter the **titles** in the cells on the top row with a *faint yellow background*. These are bolded automatically. Enter the **category labels** in the cells in the first column with a *faint blue background*. These are bolded automatically. Enter **counts** in the cells with a *white background*. Cells left empty are treated as zeros.

Click the **Reset Table** button below to reset the table. When resetting the table, the number of categories and variables does not change.

Missing Values Tab

This panel lets you specify up to five missing values (besides the default of blank). For example, “0”, “9”, or “NA” may be missing values in your database.

Missing Value Options

Missing Value Inclusion

Specify whether to include or exclude observations with missing values in the tables and/or reports.

Possible selections are:

- **Delete All**
This option indicates that you want the missing values totally ignored.
- **Include in Counts**
This option indicates that you want the number of missing values displayed, but you do not want them to influence any of the percentages. All percentages related to missing values are given the value of 0.
- **Include in All**
This option indicates that you want the missing values treated just like any other category. They will be included in all percentages and counts.

Label for Missing Values

Specify the label to be used to label missing values in the output.

Data Values to be Treated as “Missing”

Missing Value

Specify a value to be treated as a missing value by this procedure. This value is treated as a missing value in all active categorical variables. Up to 5 different missing values may be entered.

Reports Tab

These options control which of the available reports and plots are displayed.

Select Reports

Frequency Distribution Table Report

Check to display a frequency table for each variable.

Category Order

Select the order in which to display categories.

The options are

- **Sort by Category**
Categories will be displayed in default order based on category values.
- **Sort by Count (Descending)**
Categories will be displayed in descending order (high to low) based on counts.
- **Sort by Count (Ascending)**
Categories will be displayed in ascending order (low to high) based on counts.

Multinomial Test

Indicate whether to calculate the multinomial test for each variable.

Select Reports – Expected Values for the Multinomial Test

Expected Values

The multinomial test is a test of the proportions associated with a frequency table. In order to run the test, you need a set of hypothesized proportions. This box lets you enter these proportions. There are two ways of specifying the hypothesized proportions.

First, you can leave it blank to indicate that you want to test whether the proportions in the frequency table are all equal. This is the same as entering “1,1,1,1,1” (if the variable has six or fewer categories).

Second, you can enter a set of values separated by commas. These values are then rescaled so that they sum to one. For example, the entry “1,1,1,1” would be rescaled to “0.25, 0.25, 0.25, 0.25.” If you enter more numbers than are needed for a particular table, the extras are ignored. If you do not enter enough numbers, the remaining proportions are set to zero.

Individual Tables Across Variables

Counts Table ... Table Percentages Table

Specify whether to display this table. Each variable represents a separate column on the table.

Combined Table Across Variables

Show Combined Table

Specify whether to display a combined table with counts and percentages together.

Combined Table – Items on Table

Counts ... Table Percents

Specify whether to display these items on the combined table.

Report Options Tab

The following options control the format of the reports.

Report Options

Variable Names

Specify whether to use variable names, variable labels, or both to label output reports. In this discussion, the variables are the columns of the data table.

- **Names**
Variable names are the column headings that appear on the data table. They may be modified by clicking the Column Info button on the Data window or by clicking the right mouse button while the mouse is pointing to the column heading.
- **Labels**
This refers to the optional labels that may be specified for each column. Clicking the Column Info button on the Data window allows you to enter them.
- **Both**
Both the variable names and labels are displayed.

Comments

1. Most reports are formatted to receive about 12 characters for variable names.
2. Variable Names cannot contain blanks or math symbols (like + - * / . ,), but variable labels can.

Value Labels

Value Labels are used to make reports more legible by assigning meaningful labels to numbers and codes.

The options are

- **Data Values**
All data are displayed in their original format, regardless of whether a value label has been set or not.
- **Value Labels**
All values of variables that have a value label variable designated are converted to their corresponding value label when they are output. This does not modify their value during computation.
- **Both**
Both data value and value label are displayed.

Example

A variable named GENDER (used as a grouping variable) contains 1's and 2's. By specifying a value label for GENDER, the report can display "Male" instead of 1 and "Female" instead of 2. This option specifies whether (and how) to use the value labels.

Table Formatting

Column Justification

Specify whether data columns in the tables will be left or right justified.

Column Widths

Specify how the widths of columns in the tables will be determined.

The options are

- **Autosize to Minimum Widths**

Each data column is individually resized to the smallest width required to display the data in the column. This usually results in columns with different widths. This option produces the most compact table possible, displaying the most data per page.

- **Autosize to Equal Minimum Width**

The smallest width of each data column is calculated and then all columns are resized to the width of the widest column. This results in the most compact table possible where all data columns have the same width. This is the default setting.

- **Custom (User-Specified)**

Specify the widths (in inches) of the columns directly instead of having the software calculate them for you.

Custom Widths (Single Value or List)

Enter one or more values for the widths (in inches) of columns in the tables. This option is only displayed if Column Widths is set to “Custom (User-Specified)”.

- **Single Value**

If you enter a single value, that value will be used as the width for all data columns in the table.

- **List of Values**

Enter a list of values separated by spaces corresponding to the widths of each column. The first value is used for the width of the first data column, the second for the width of the second data column, and so forth. Extra values will be ignored. If you enter fewer values than the number of columns, the last value in your list will be used for the remaining columns.

Type the word “Autosize” for any column to cause the program to calculate its width for you. For example, enter “1 Autosize 0.7” to make column 1 be 1 inch wide, column 2 be sized by the program, and column 3 be 0.7 inches wide.

Wrap Column Headings onto Two Lines

Check this option to make column headings wrap onto two lines. Use this option to condense your table when your data are spaced too far apart because of long column headings.

Decimal Places

Item Decimal Places

These decimal options allow the user to specify the number of decimal places for items in the output. Your choice here will not affect calculations; it will only affect the format of the output.

Frequency Tables

Auto

If one of the “Auto” options is selected, the ending zero digits are not shown. For example, if “Auto (0 to 7)” is chosen,

0.0500 is displayed as 0.05

1.314583689 is displayed as 1.314584

The output formatting system is not designed to accommodate “Auto (0 to 13)”, and if chosen, this will likely lead to lines that run on to a second line. This option is included, however, for the rare case when a very large number of decimals is needed.

Omit Percent Sign after Percentages

The program normally adds a percent sign, %, after each percentage. Checking this option will cause this percent sign to be omitted.

Plots Tab

Frequency Distribution Charts

Counts Bar Chart, Percents Bar Chart, Counts Pie Chart, Percents Pie Chart

Check each plot that is to be displayed. Click the plot format button to change the plot settings.

Category Order

Select the order in which to display categories.

The options are

- **Use Table Order**
Categories will be displayed in the same order as displayed in the Frequency Distribution Table Report. If the table is not displayed, categories will be displayed in default order based on category values.
- **Sort by Category**
Categories will be displayed in default order based on category values.
- **Sort by Count (Descending)**
Categories will be displayed in descending order (high to low) based on counts.
- **Sort by Count (Ascending)**
Categories will be displayed in ascending order (low to high) based on counts.

Two-Factor Bar Charts Across Variables

Counts Bar Chart ... Table Percentages Bar Chart

Check each plot that is to be displayed. Click the plot format button to change the plot settings.

General Plot Options

Show Break as Title

Specify whether to display the values of the break variables as the second title line on the plots.

Frequency Tables

Example 1 – Standard Frequency Tables

The data for this example are found in the **Resale** dataset. You may follow along here by making the appropriate entries or load the completed template **Example 1a** by clicking on Open Example Template from the File menu of the Frequency Tables window.

1 Open the Resale dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Resale.NCSS**.
- Click **Open**.

2 Open the Frequency Tables window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Frequency Tables** procedure.
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

3 Specify the variables.

- Select the **Variables tab**.
- For **Type of Data Input** select **Column(s) in the Database**.
- Double-click in the **Categorical Variables** text box. This will bring up the variable selection window.
- Select **State** and **City** from the list of variables and then click **Ok**. “State-City” will appear in the Categorical Variables box.

4 Specify the report format.

- Click on the **Report Options tab**.
- In **Variable Names**, select **Labels**.
- In **Value Labels**, select **Value Labels**.

5 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Output

Frequency Distribution of State

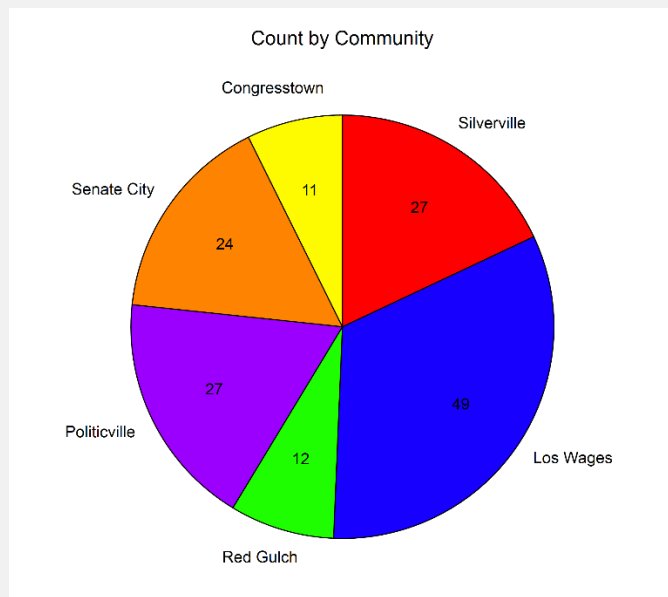
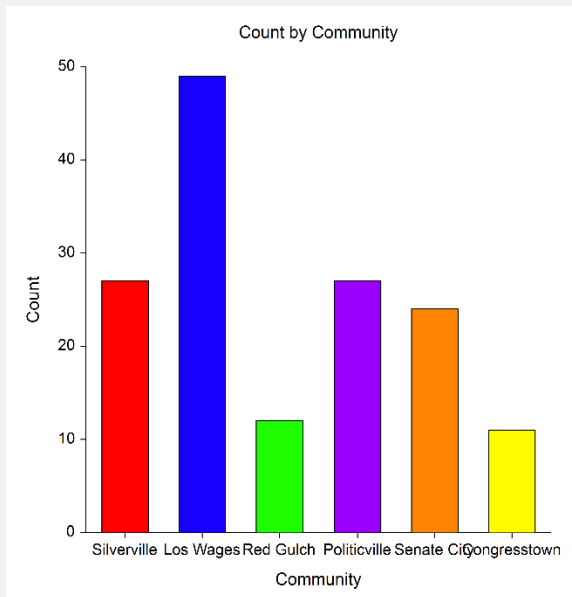
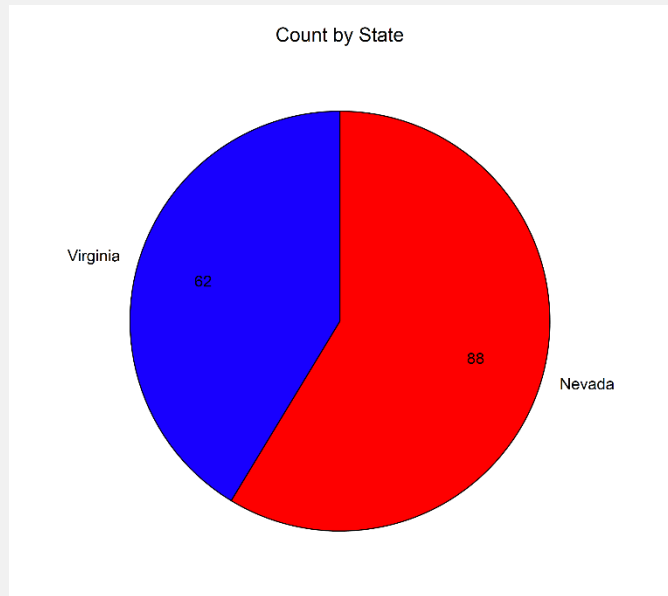
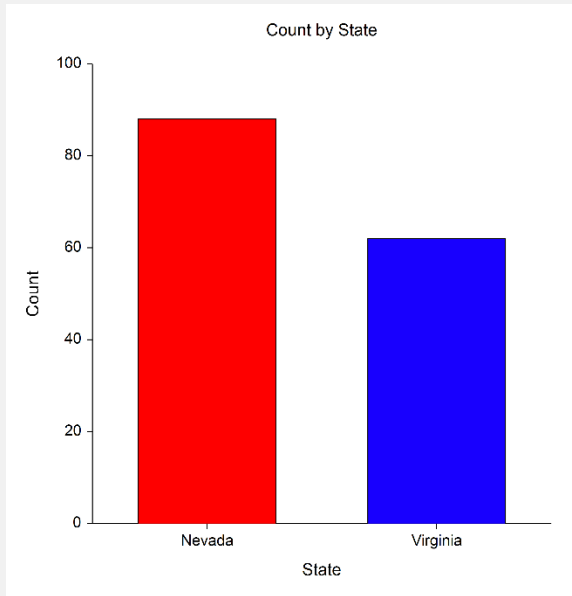
State	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Nevada	88	88	58.67%	58.67%	
Virginia	62	150	41.33%	100.00%	

Frequency Distribution of Community

Community	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Silverville	27	27	18.00%	18.00%	
Los Wages	49	76	32.67%	50.67%	
Red Gulch	12	88	8.00%	58.67%	
Politicville	27	115	18.00%	76.67%	
Senate City	24	139	16.00%	92.67%	
Congresstown	11	150	7.33%	100.00%	

Frequency Tables

Frequency Distribution Charts



This report presents the counts (the frequencies), percentages, and a rough bar graph of the data. Note that the bar graph is constructed so that each “|” is worth 2.5 percentage points. By default, distribution bar charts and pie charts are also output.

The frequency table and plots can be modified to display the values in descending or ascending order, sorted by counts. You may follow along here by making the appropriate modifications to the current settings or load the completed template **Example 1b** by clicking on Open Example Template from the File menu of the Frequency Tables window.

6 Modify the Category Order.

- Select the **Reports** tab.
- For **Category Order** under **Frequency Distribution Table Report**, select **Sort by Count (Descending)**.

Frequency Tables

7 Run the procedure again.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Output

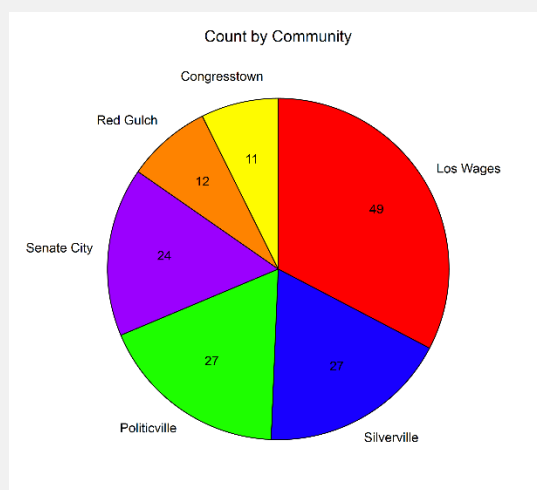
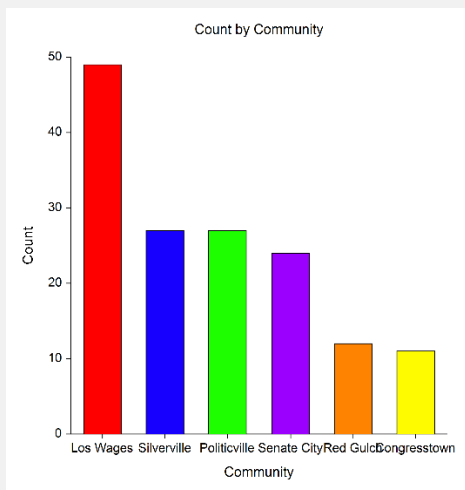
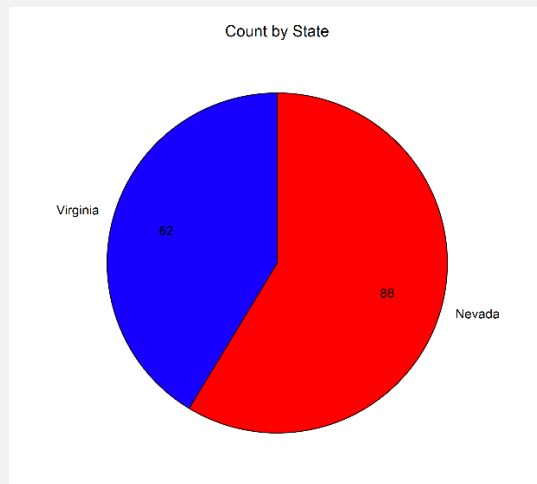
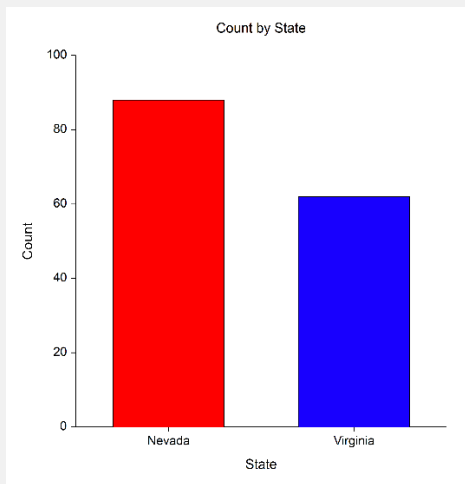
Frequency Distribution of State

State	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Nevada	88	88	58.67%	58.67%	
Virginia	62	150	41.33%	100.00%	

Frequency Distribution of Community

Community	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Silverville	27	27	18.00%	18.00%	
Los Wages	49	76	32.67%	50.67%	
Red Gulch	12	88	8.00%	58.67%	
Politicville	27	115	18.00%	76.67%	
Senate City	24	139	16.00%	92.67%	
Congresstown	11	150	7.33%	100.00%	

Frequency Distribution Charts



The reports and plots are now sorted by count, high to low. Note that the plots follow the table because of the Category Order setting on the Plots tab. This setting can be changed to make the plots different from the reports.

Example 2 – Multinomial Test

Suppose we want to test whether the proportion for Nevada is 50% higher than that for Virginia. The data for this example are found in the Resale dataset. You may follow along here by making the appropriate entries or load the completed template **Example 2** by clicking on Open Example Template from the File menu of the Frequency Tables window.

1 Open the Resale dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Resale.NCSS**.
- Click **Open**.

2 Open the Frequency Tables window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Frequency Tables** procedure.
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

3 Specify the variables.

- Select the **Variables** tab.
- For **Type of Data Input** select **Column(s) in the Database**.
- Double-click in the **Categorical Variables** text box. This will bring up the variable selection window.
- Select **State** from the list of variables and then click **Ok**. “State” will appear in the Variables box.

4 Specify the reports.

- Click on the **Reports** tab.
- Check the **Frequency Table Report** box.
- Check the **Multinomial Test Report** box.
- In the **Expected Values for Multinomial Test** box, enter **60, 40**.

5 Specify the report format.

- Click on the **Report Options** tab.
- In **Variable Names**, select **Labels**.
- In **Value Labels**, select **Value Labels**.

6 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Output

Frequency Distribution of State					
State	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Nevada	88	88	58.67%	58.67%	
Virginia	62	150	41.33%	100.00%	

Multinomial Test of State					
State	Count	Expected Count	Actual Percent	Expected Percent	Chi-Square Amount
Nevada	88	90.00	58.67%	60.00%	0.0444
Virginia	62	60.00	41.33%	40.00%	0.0667
Chi-Square = 0.1111 with df = 1 Probability Level = 0.738883					

The first table is the standard frequency table. The second table presents the results of the multinomial test. Note that in this case, the test is not significant.

Frequency Tables

Count

The number of observations (rows) in which the variable has the value reported on this line. This is the value of O_i .

Expected Count

The number of observations (rows) that would be obtained if the hypothesized proportions were followed exactly. This is the value of E_i .

Actual Percent

The percent that this category is of the total.

Expected Percent

The percentage that this category would have if the hypothesized proportions were followed exactly.

Chi-Square Amount

The amount that this line contributes to the Chi-square statistic. This is equal to

$$CS_i = \frac{(O_i - E_i)^2}{E_i}$$

where O_i is the actual count and E_i is the expected count of the i^{th} category.

Chi-Square

This is the value of the chi-square test statistic.

$$\chi^2_{k-1} = \sum_{i=1}^k \frac{(O_i - E_i)^2}{E_i}$$

df

The degrees of freedom of the above test statistic. This is equal to the number of categories minus one.

Probability Level

This is the significance level of the multinomial test. If you are testing at an alpha of 0.05, you would reject the null hypothesis that the hypothesized proportions are true if this value is less than 0.05.

Example 3 – Frequency Tables and Multinomial Tests from Summary Data

Using the same variables and data as in Example 2, an alternate way to enter the data for this procedure is to enter the counts for each category directly. This is done by setting **Type of Data Input** to **Table of Counts**. You may follow along here by making the appropriate modifications to the current settings or load the completed template Example 3 by clicking on Open Example Template from the File menu of the Frequency Tables window.

1 Open the Frequency Tables window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Frequency Tables** procedure.
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

2 Specify the variables.

- Select the **Variables** tab.
- For **Type of Data Input** select **Table of Counts**.
- For **Categories (Rows)** enter **2**.
- For **Variables (Columns)** enter **1**.
- In the **Table of Counts**, enter **Nevada** and **Virginia** as the **Category Labels**, **State** as the **Variable Name**, and **88** and **62** as the **cell counts**.

3 Specify the reports.

- Click on the **Reports** tab.
- Check the **Frequency Table Report** box.
- Check the **Multinomial Test Report** box.
- In the **Expected Values for Multinomial Test** box, enter **60, 40**.

4 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Output

Frequency Distribution of State					
State	Count	Cumulative Count	Percent	Cumulative Percent	Graph of Percent
Nevada	88	88	58.67%	58.67%	
Virginia	62	150	41.33%	100.00%	

Multinomial Test of State					
State	Count	Expected Count	Actual Percent	Expected Percent	Chi-Square Amount
Nevada	88	90.00	58.67%	60.00%	0.0444
Virginia	62	60.00	41.33%	40.00%	0.0667

Chi-Square = 0.1111 with df = 1 Probability Level = 0.738883

The output is exactly the same as in Example 2.

Example 4 – Tables and Two-Factor Bar Charts of Counts and Percentages Across Variables

This example will show how to obtain some of the other table formats that are available from this procedure. The data for this example are found in the Resale dataset. You may follow along here by making the appropriate entries or load the completed template **Example 4a** by clicking on Open Example Template from the File menu of the Frequency Tables window.

1 Open the Resale dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Resale.NCSS**.
- Click **Open**.

2 Open the Frequency Tables window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Frequency Tables** procedure.
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

3 Specify the variables.

- Select the **Variables tab**.
- For **Type of Data Input** select **Column(s) in the Database**.
- Double-click in the **Categorical Variables** text box. This will bring up the variable selection window.
- Select **Garage**, **Fireplace**, and **Brick** from the list of variables and then click **Ok**. “Garage-Fireplace,Brick” will appear in the Categorical Variables box.

4 Specify the reports.

- Click on the **Reports tab**.
- Uncheck **Frequency Table Report**.
- Check **Counts Table**.
- Check **Row Percentages Table**.
- Check **Column Percentages Table**.
- Check **Table Percentages Table**.
- Click on the **Plots tab**.

5 Specify the plots.

- Click on the **Plots tab**.
- Check **Counts Plot**.
- Check **Row Percentages Plot**.
- Check **Column Percentages Plot**.
- Check **Table Percentage Plot**.

6 Specify the report format.

- Click on the **Report Options tab**.
- In **Variable Names**, select **Labels**.
- In **Value Labels**, select **Value Labels**.

7 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Frequency Tables

Output

Counts Table

<u>Values</u>	<u>Variables</u>			<u>Total</u>
	<u>Garage Size</u>	<u>Fireplaces</u>	<u>Brick Ratio</u>	
0	7	39	51	97
0.5	0	0	47	47
1	98	78	52	228
2	43	33	0	76
3	2	0	0	2
Total	150	150	150	450

Row Percentages Table

<u>Values</u>	<u>Variables</u>			<u>Total</u>
	<u>Garage Size</u>	<u>Fireplaces</u>	<u>Brick Ratio</u>	
0	7.2%	40.2%	52.6%	100.0%
0.5	0.0%	0.0%	100.0%	100.0%
1	43.0%	34.2%	22.8%	100.0%
2	56.6%	43.4%	0.0%	100.0%
3	100.0%	0.0%	0.0%	100.0%
Total	33.3%	33.3%	33.3%	100.0%

Column Percentages Table

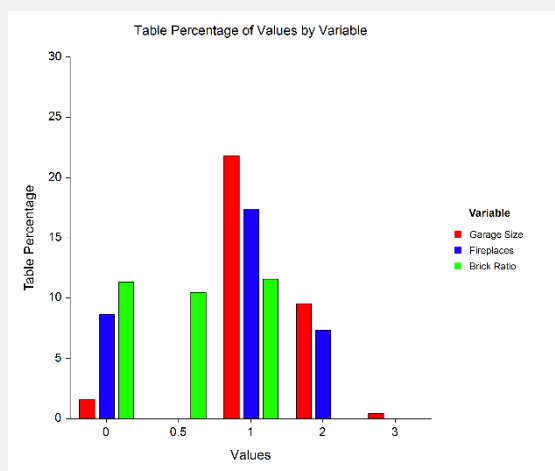
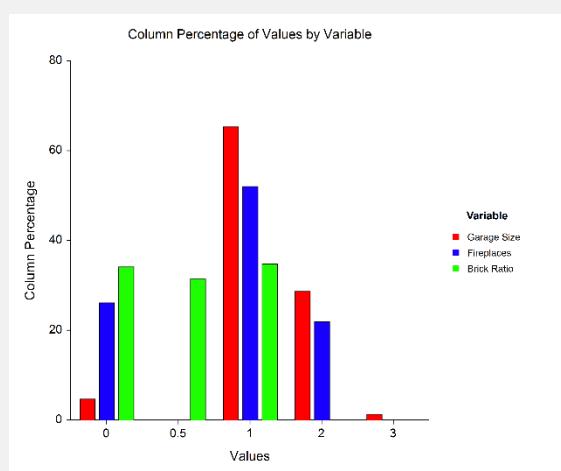
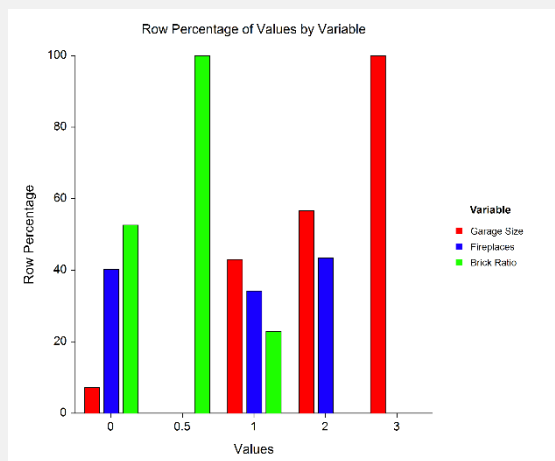
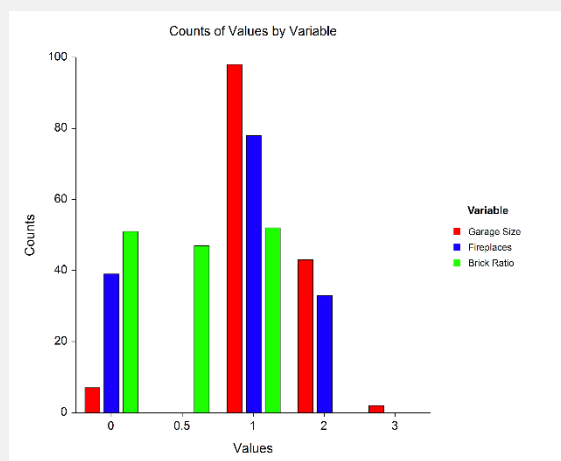
<u>Values</u>	<u>Variables</u>			<u>Total</u>
	<u>Garage Size</u>	<u>Fireplaces</u>	<u>Brick Ratio</u>	
0	4.7%	26.0%	34.0%	21.6%
0.5	0.0%	0.0%	31.3%	10.4%
1	65.3%	52.0%	34.7%	50.7%
2	28.7%	22.0%	0.0%	16.9%
3	1.3%	0.0%	0.0%	0.4%
Total	100.0%	100.0%	100.0%	100.0%

Table Percentages Table

<u>Values</u>	<u>Variables</u>			<u>Total</u>
	<u>Garage Size</u>	<u>Fireplaces</u>	<u>Brick Ratio</u>	
0	1.6%	8.7%	11.3%	21.6%
0.5	0.0%	0.0%	10.4%	10.4%
1	21.8%	17.3%	11.6%	50.7%
2	9.6%	7.3%	0.0%	16.9%
3	0.4%	0.0%	0.0%	0.4%
Total	33.3%	33.3%	33.3%	100.0%

Frequency Tables

Two-Factor Bar Charts Across Variables



This report presents tables containing counts and various percentages for all the variables selected. It also provides two-way bar charts of the counts and percentages.

An alternate way to enter this summarized data is to set **Type of Data Input** to **Table of Counts**. You may follow along here by making the appropriate modifications to the current settings or load the completed template **Example 4b** by clicking on Open Example Template from the File menu of the Frequency Tables window.

8 Modify the Data Input Type.

- Select the **Variables** tab.
- For **Type of Data Input**, select **Table of Counts**.
- For **Categories (Rows)**, enter **5**.
- For **Variables (Columns)**, enter **3**.
- Enter the variable titles, category labels, and counts from the **Combined Table** in the output into the **Table of Counts** on the input window.

9 Run the procedure again.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

The output will be exactly the same as that displayed above.

Example 5 – Combined Table

This example will show how to obtain a combined table of various counts and percentages. The data for this example are found in the Resale dataset. You may follow along here by making the appropriate entries or load the completed template **Example 5a** by clicking on Open Example Template from the File menu of the Frequency Tables window.

1 Open the Resale dataset.

- From the File menu of the NCSS Data window, select **Open Example Data**.
- Click on the file **Resale.NCSS**.
- Click **Open**.

2 Open the Frequency Tables window.

- Using the Analysis menu or the Procedure Navigator, find and select the **Frequency Tables** procedure.
- On the menus, select **File**, then **New Template**. This will fill the procedure with the default template.

3 Specify the variables.

- Select the **Variables tab**.
- For **Type of Data Input** select **Column(s) in the Database**.
- Double-click in the **Categorical Variables** text box. This will bring up the variable selection window.
- Select **Garage**, **Fireplace**, and **Brick** from the list of variables and then click **Ok**. “Garage-Fireplace,Brick” will appear in the Categorical Variables box.

4 Specify the reports.

- Click on the **Reports tab**.
- Uncheck **Frequency Table Report**.
- Check **Show Combined Table**.
- Check **Counts**.
- Check **Row Percents**.
- Check **Column Percents**.
- Check **Table Percents**.

5 Specify the report format.

- Click on the **Report Options tab**.
- In **Variable Names**, select **Labels**.
- In **Value Labels**, select **Value Labels**.

6 Run the procedure.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

Frequency Tables

Output

<u>Values</u>		<u>Variables</u>			
		Garage Size	Fireplaces	Brick Ratio	Total
0	Count	7	39	51	97
	% within Row	7.2%	40.2%	52.6%	100.0%
	% within Column	4.7%	26.0%	34.0%	21.6%
	% of Total	1.6%	8.7%	11.3%	21.6%
0.5	Count	0	0	47	47
	% within Row	0.0%	0.0%	100.0%	100.0%
	% within Column	0.0%	0.0%	31.3%	10.4%
	% of Total	0.0%	0.0%	10.4%	10.4%
1	Count	98	78	52	228
	% within Row	43.0%	34.2%	22.8%	100.0%
	% within Column	65.3%	52.0%	34.7%	50.7%
	% of Total	21.8%	17.3%	11.6%	50.7%
2	Count	43	33	0	76
	% within Row	56.6%	43.4%	0.0%	100.0%
	% within Column	28.7%	22.0%	0.0%	16.9%
	% of Total	9.6%	7.3%	0.0%	16.9%
3	Count	2	0	0	2
	% within Row	100.0%	0.0%	0.0%	100.0%
	% within Column	1.3%	0.0%	0.0%	0.4%
	% of Total	0.4%	0.0%	0.0%	0.4%
Total	Count	150	150	150	450
	% within Row	33.3%	33.3%	33.3%	100.0%
	% within Column	100.0%	100.0%	100.0%	100.0%
	% of Total	33.3%	33.3%	33.3%	100.0%

This report presents a single table that combines the counts and percentages of all variables selected.

An alternate way to enter this summarized data is to set **Type of Data Input** to **Table of Counts**. You may follow along here by making the appropriate modifications to the current settings or load the completed template **Example 5b** by clicking on Open Example Template from the File menu of the Frequency Tables window.

7 Modify the Data Input Type.

- Select the **Variables tab**.
- For **Type of Data Input**, select **Table of Counts**.
- For **Categories (Rows)**, enter **5**.
- For **Variables (Columns)**, enter **3**.
- Enter the variable titles, category labels, and counts from the **Counts Table** in the output into the **Table of Counts** on the input window.

8 Run the procedure again.

- From the Run menu, select **Run Procedure**. Alternatively, just click the green Run button.

The output will be exactly the same as that displayed above.