Moving From Minitab® to JMP®:
A Transition Guide

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Introduction

Statistical software has become indispensable for many individuals as a primary tool for designing research studies and analyzing data. While users are typically most familiar with one software package, it is sometimes necessary to transition from one software to another.

This white paper explores the user interface and workflow differences between Minitab and JMP in an effort to ease the transition for experienced Minitab users who are moving to JMP. We will build our exploration around a few simple examples.

- **Minitab** is a graphical user interface (GUI) or "point-and-click" statistical software program that is very popular in the design and statistical analysis of data. Minitab offers a wide array of analytic tools to work with many different types of data. Users with quality control and industrial statistics backgrounds may find the interface within Minitab easy to use because of language and options that are common in those areas.

- **JMP** is also GUI-based analytics software developed by SAS. A major focus of JMP over its 25-year history has been the visual exploration and analysis of data. JMP offers customized tools specifically designed to help users interact simultaneously with visuals, analyses and data.

The most important difference between Minitab and JMP is that while they perform many of the same analyses, the two programs approach statistical analysis from different perspectives. Minitab is designed for direct analysis and contains menus organized around these specific analytic techniques. JMP, by contrast, creates a dynamic link between data and analysis that facilitates an exploratory approach. The purpose of this transition guide, ultimately, is to illustrate this difference in the context of some familiar analytical techniques.
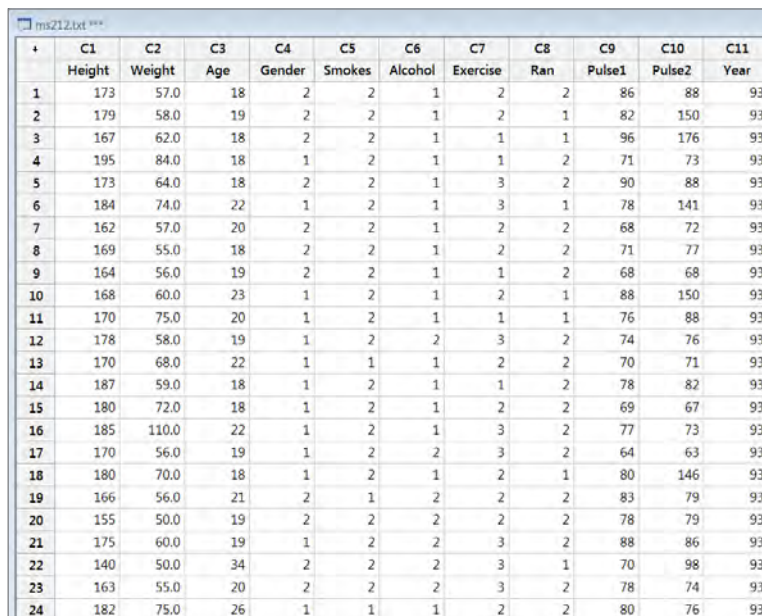
Our sample data set

Most of the comparison will focus on a data set commonly used for teaching introductory statistics. To collect this data, students in an introductory statistics class, taught by Professor John Eccleston and Richard Wilson, PhD, at The University of Queensland, participated in a simple experiment. The students took their own resting pulse rates and then were asked to flip a coin. If the coin came up heads, they were to run in place for one minute: otherwise they sat for one minute. Then everyone took their pulse again. The resulting pulse rates and other physiological and lifestyle data are given in the data. The data can be found online at the Australasian Data and Story Library: statsci.org/data/oz/ms212.html.

Importing and cleaning data

We start by opening the data (a tab-delimited text file available at the website listed in the previous section), which can be modified into many formats but can also be directly imported into either software. Let's start with opening the file and viewing data in Minitab.

Minitab

Upon opening Minitab, you can open the text file using the Open Worksheet options under the File menu. Minitab responds well to non-native file formats such as tab- or comma-separated files and opens the data as follows:

ms212.txt ***

↓	C1 Height	C2 Weight	C3 Age	C4 Gender	C5 Smokes	C6 Alcohol	C7 Exercise	C8 Ran	C9 Pulse1	C10 Pulse2	C11 Year
1	173	57.0	18	2	2	1	2	2	86	88	93
2	179	58.0	19	2	2	1	2	1	82	150	93
3	167	62.0	18	2	2	1	1	1	96	176	93
4	195	84.0	18	1	2	1	1	2	71	73	93
5	173	64.0	18	2	2	1	3	2	90	88	93
6	184	74.0	22	1	2	1	3	1	78	141	93
7	162	57.0	20	2	2	1	2	2	68	72	93
8	169	55.0	18	2	2	1	2	2	71	77	93
9	164	56.0	19	2	2	1	1	2	68	68	93
10	168	60.0	23	1	2	1	2	1	88	150	93
11	170	75.0	20	1	2	1	1	1	76	88	93
12	178	58.0	19	1	2	2	3	2	74	76	93
13	170	68.0	22	1	1	1	2	2	70	71	93
14	187	59.0	18	1	2	1	1	2	78	82	93
15	180	72.0	18	1	2	1	2	2	69	67	93
16	185	110.0	22	1	2	1	3	2	77	73	93
17	170	56.0	19	1	2	2	3	2	64	63	93
18	180	70.0	18	1	2	1	2	1	80	146	93
19	166	56.0	21	2	1	2	2	2	83	79	93
20	155	50.0	19	2	2	2	2	2	78	79	93
21	175	60.0	19	1	2	2	3	2	88	86	93
22	140	50.0	34	2	2	2	3	1	70	98	93
23	163	55.0	20	2	2	2	3	2	78	74	93
24	182	75.0	26	1	1	1	2	2	80	76	93

A quick glance at the spreadsheet reveals 11 variables and 110 observations. We see data on height and weight (measured in cm and kg respectively), age, gender (male = 1), smoking and alcohol use (yes = 1), exercise frequency (1 = high, 2=moderate, 3=low), ran or sat status (1=ran), baseline and follow-up pulse, and year the class met.

Given that there are a handful of categorical variables in this dataset listed as numeric quantities, it can be helpful to indicate in Minitab that these variables are not to be considered as continuous numeric values. This kind of routine data cleaning and manipulation is commonplace and necessary before beginning any analysis.

In Minitab, such changes are made by converting the numeric data to text. We start by adding a new column (Column C12) that will be labeled Gender Recode. Using the Numeric to Text option we recode all of the "1s" as Male and the "2s" as Female. You may directly overwrite the original column by selecting the same column for the Code Data From Columns and Store Coded Data in Columns fields.
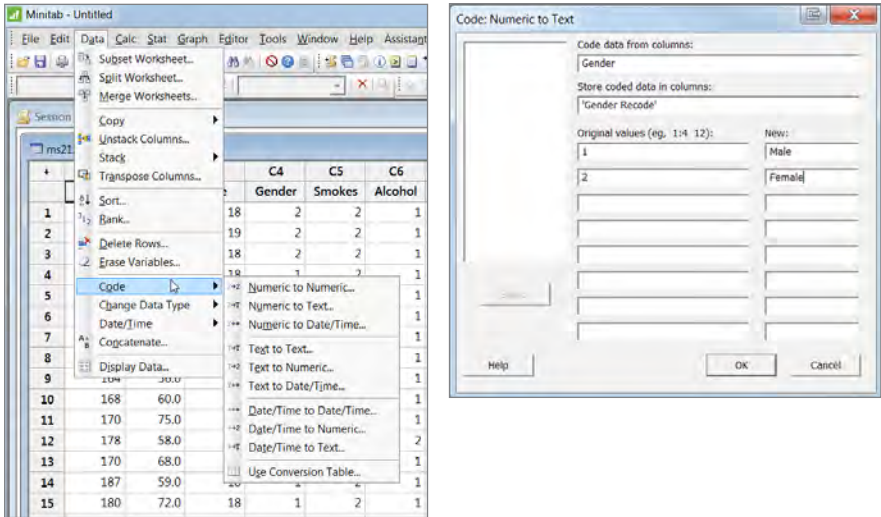
Minitab represents any character variable with a "-T" indicator at the top of the column indicator. Here, for example, we have added a column C12 that will represent the Gender Recoded variable. After this recoding Minitab will change the header of that column to C12-T to indicate that is a text-based column.

Many experienced Minitab users are familiar with the Project Manager window and recognize the utility and versatility in using this option. Here we can use the Project Manager to change the order of values in the Gender Recode column. By default, Minitab uses numeric ordering for numeric variables (1, 2 ,3, ...) and alphabetic ordering for text columns (a, b, c, …).

In this example, the values for Gender Recode are organized as (Female, Male) with Male being used as the reference group. You can change the value ordering in the Project Manager by right-clicking on the column of interest as shown in the visuals below:
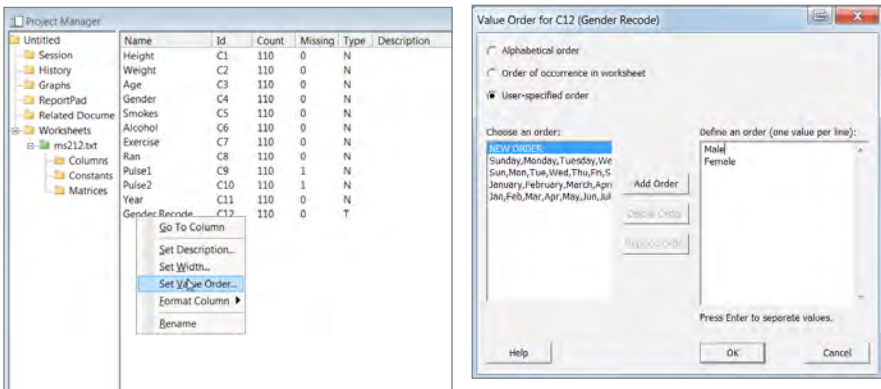
JMP®

Transitioning to JMP, we open the same data and do the same manipulations. Since this is a transition guide to JMP, examine what happens when starting the program. When JMP starts, the first thing you receive is a Home Window, which manages different windows for data, logs and output. Recently used files are available on the left so that you may conveniently reopen files used in a previous session. A Tip of the Day window, with tips and pointers on using JMP, also opens.
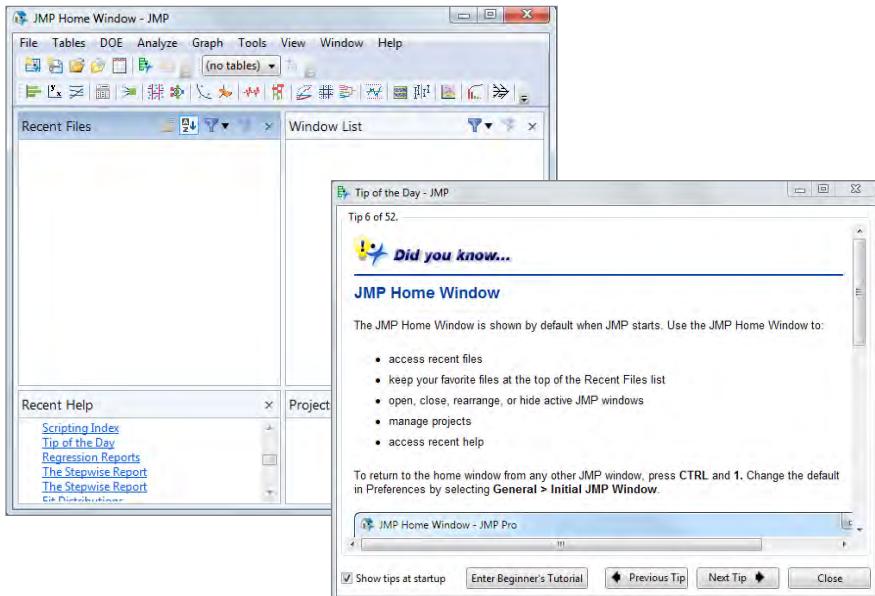

You can open the data file by going to the Open option in the File menu. Like Minitab, JMP also opens a variety of data files, including Minitab files (if Minitab is installed on the machine).

The imported data looks very similar to what we previously saw in Minitab. One noticible difference is the lack of column numbers as headings above the variable name. JMP uses a series of displays to the left of the spreadsheet to convey variable information. The middle-left panel displays the column information and shows each of the 11 variables and the modeling type. Blue triangles denote continuous variables, red bars for nominal data and green bars for ordinal data.

Note that the variables Year and Exercise were changed to ordinal (simply click on the icon and change from continuous (blue bars) to ordinal (green bars) to make it appropriate for analysis). Likewise Gender, Smokes, Alcohol and Ran were all changed to nominal (red bars). This is an important first step in JMP, because specifying modeling types will be important for later analysis.

The bottom-left-hand box summarizes the rows, and provides additional row information that we will discuss later.
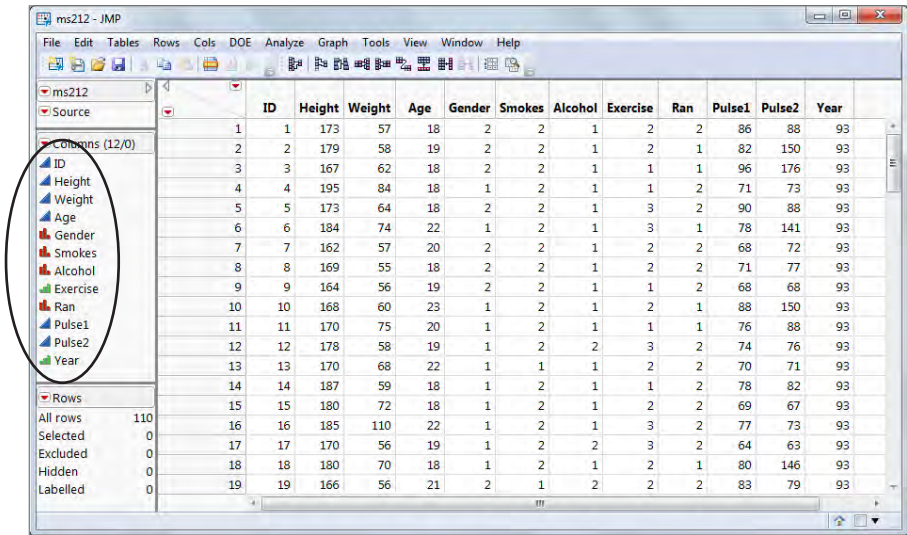
Unlike Minitab, there is no need to change a variable to text in JMP in order to add text information. Simply right-click on the column in question and go to Column Info.
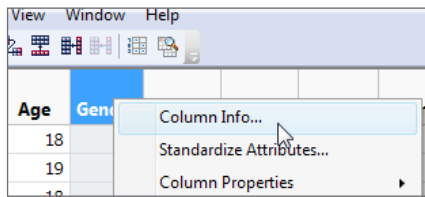
From here you can adjust different features of each column. Under Column Properties we chose the Value Labels and Value Ordering options to make adjustments.
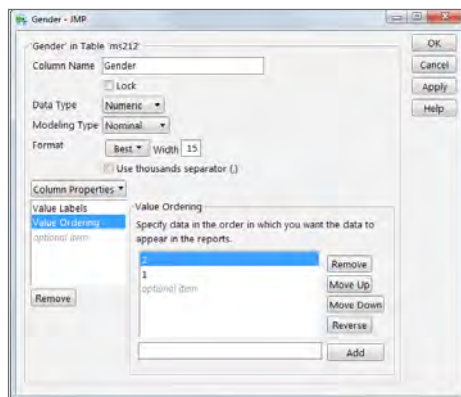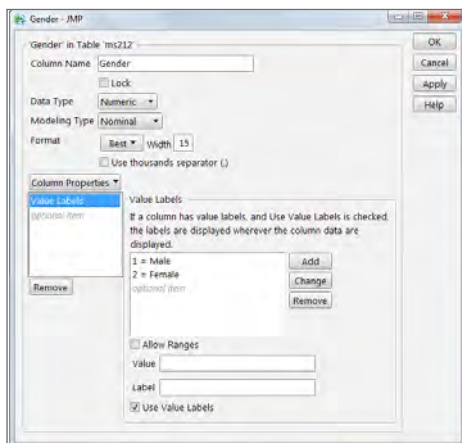
Coming back to our data we find that the labels appear in lieu of the numeric value. The asterisk next to Gender in the Columns panel lets us know that column properties have been set.
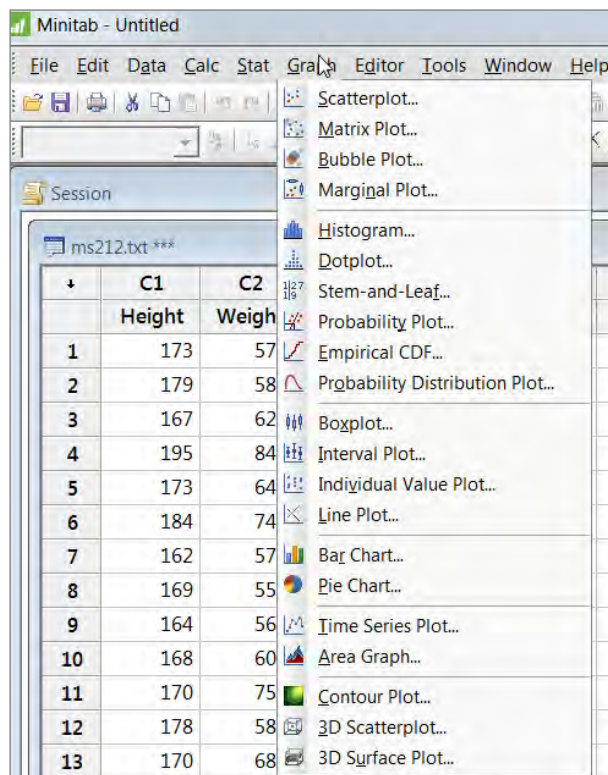

Visualization

Visualization is a powerful tool for analyzing and understanding data. The ability to easily make graphs via statistical software is one of the principal reasons why analytic software is popular. We will confine our discussion to two simple tools: bar charts and scatterplots.

Minitab

Minitab has a wide variety of visualization tools under the Graph menu. Elementary visualizations such as bar charts, histograms and scatterplots are available along with more intricate visualizations such as time series plots and bubble plots.
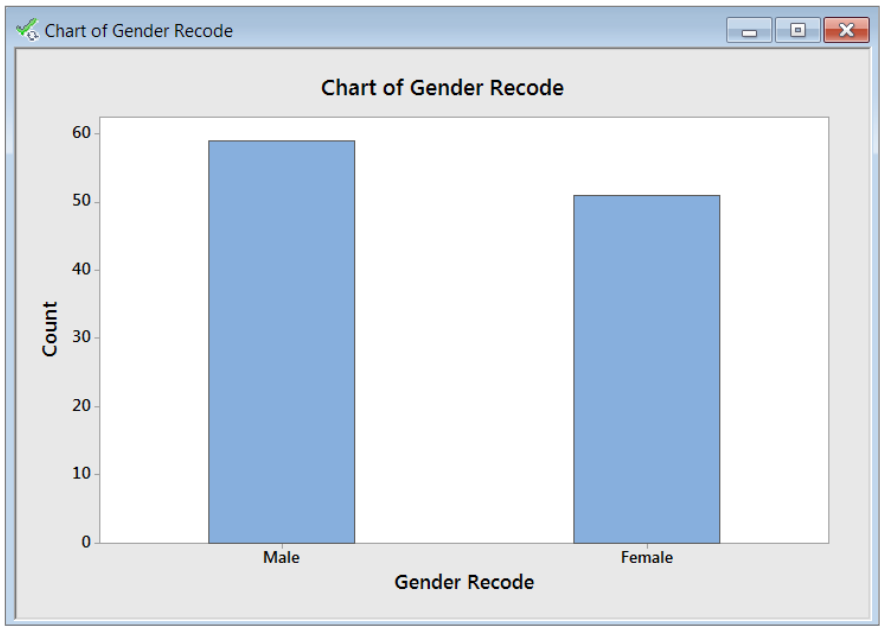
Once a visual is selected another set of windows opens to guide you through creating the necessary visualization.
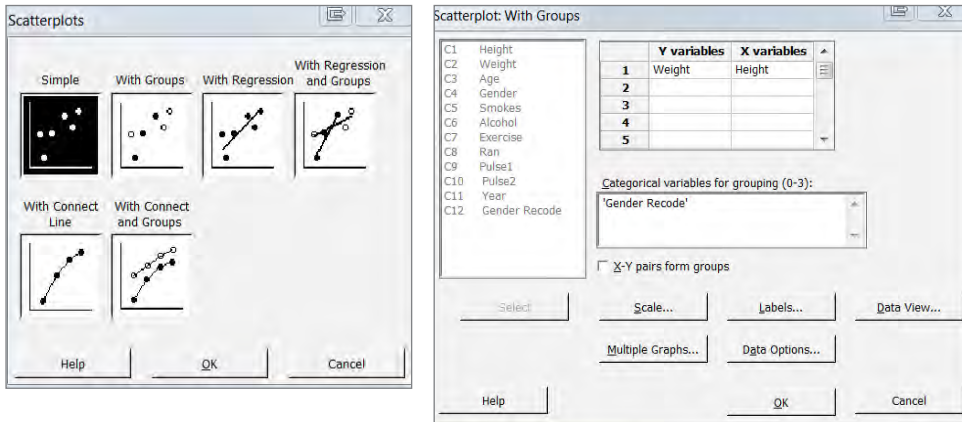
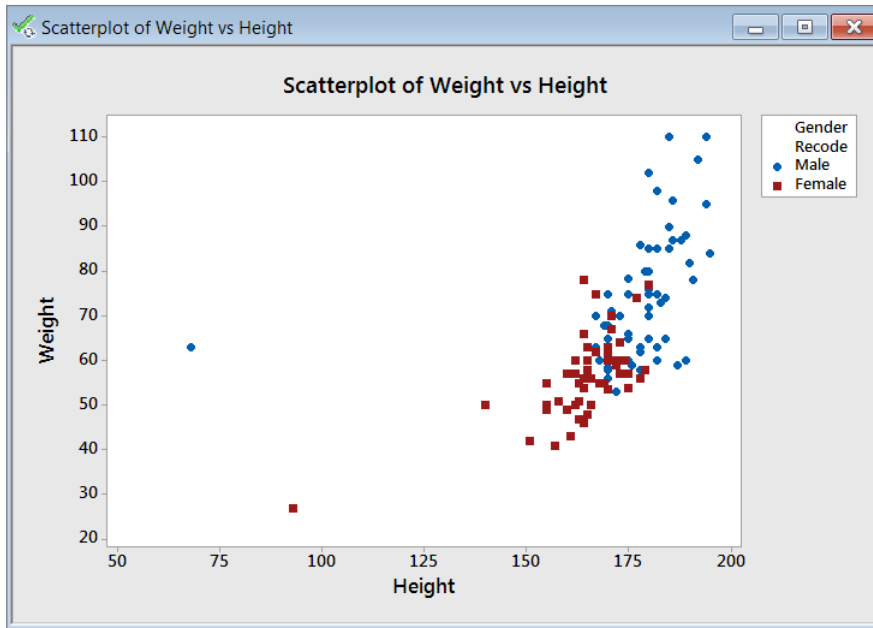Starting with bar charts, we find the following options:
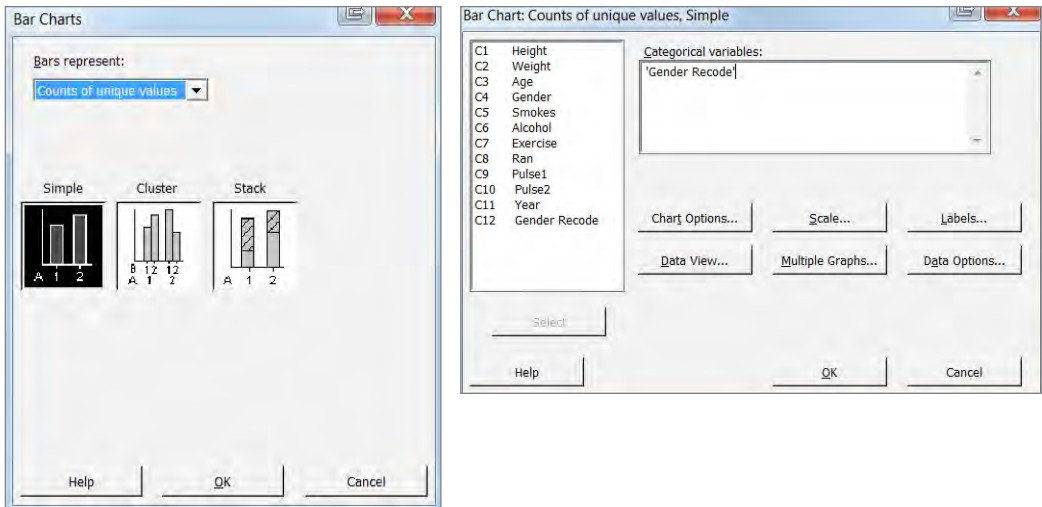
These settings create a bar chart that you can then edit further (to adjust labels, gridlines, etc.).

The story is much the same for other visualizations such as scatterplots.

Even with the addition of complex features, the menus are intuitive for individuals who know exactly what kind of graph they wish to make.

JMP®

Before we look at data visualizations in JMP, recall from the introduction that JMP was designed to be interactive. Like Minitab, JMP also features an extensive Graph menu so you can select different visualizations for your data. But JMP also features contextual menus accessed via small red triangles throughout the software. These menus allow you to customize output in the moment, depending on your analytic needs.

To explore visualization in JMP, we will start with the Chart platform. Under the Chart menu you can select Gender from the Column dialog and then load it into the Roles box. Note that the Chart platform in JMP makes bar charts for raw data as well as summaries.
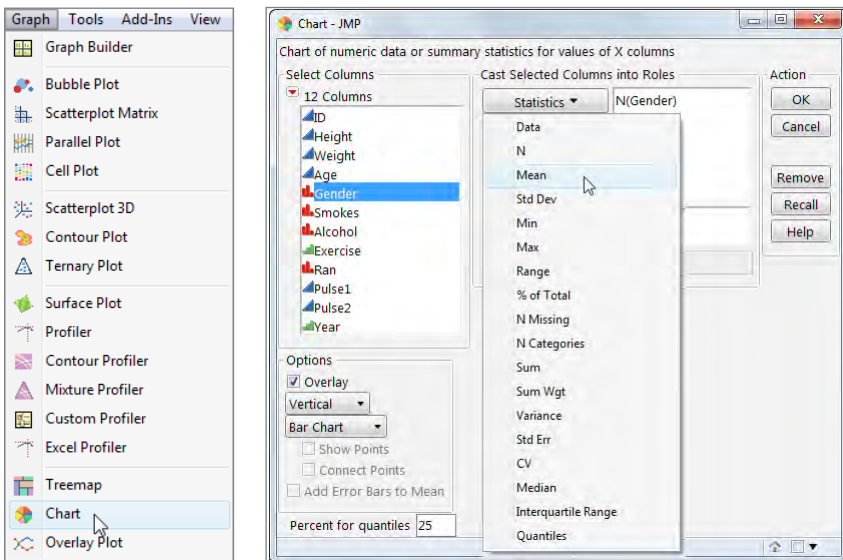
The standard output is a simple bar for each group, along with a red triangle to manipulate the output. Some options for manipulation include changing the chart from vertical to horizontal format, making pie graphs, adding percentages and manipulating the axis scale.
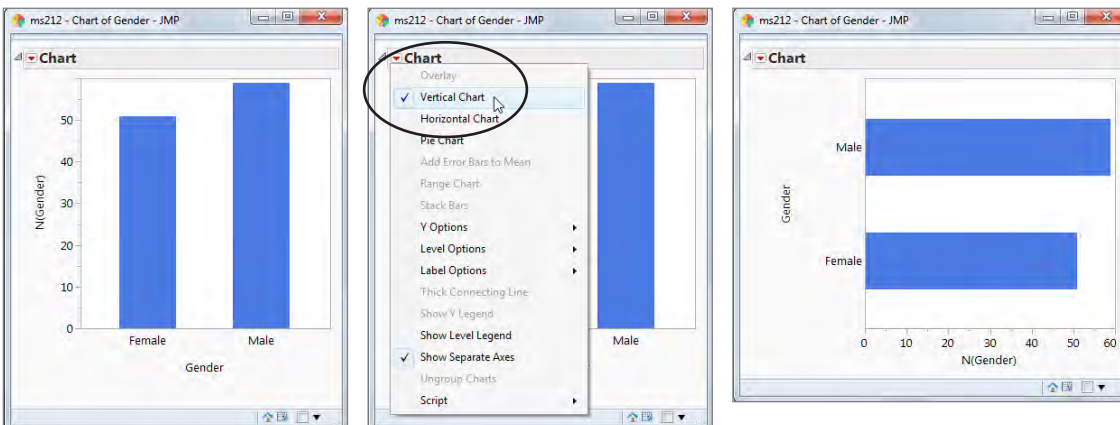
We begin to see the difference in the way JMP operates; rather than changing options prior to seeing the graph, you are allowed to look at the graph first and then make changes that take effect instantly.

Moving on to scatterplots, you may notice that there seems to be no listing for a two-dimensional scatterplot in the Graph menu. JMP instead offers a feature called Graph Builder, which allows you to interactively build graphs appropriate for your data. Instead of preselecting a graph type and then setting the variables, JMP allows you to set the variable roles first and then select the graph that makes sense for the types of variable selected – scatterplots, bar charts, box plots, histograms, etc.
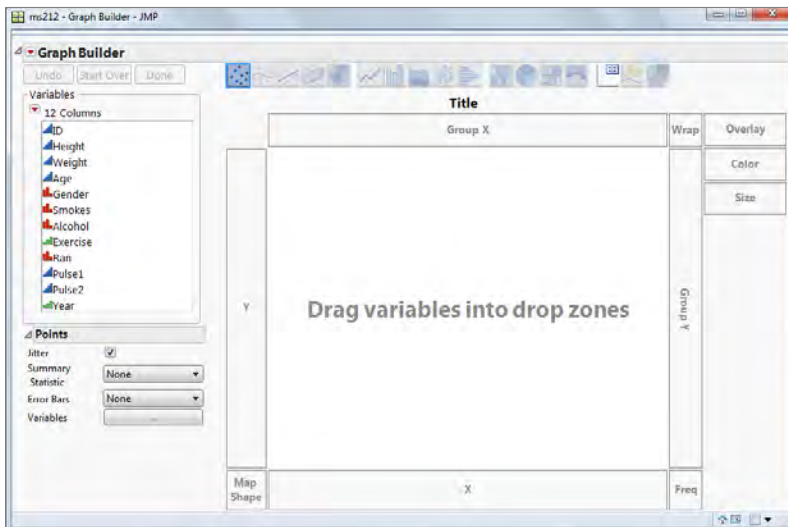

To create a color-coded scatterplot, simply click and drag Height to the X zone, Weight to the Y zone, and Gender to the Color box. Additional graph types and options (such as removing the smoother function) can be obtained by right-clicking on the graph or by clicking on the graph icons at the top. Clicking the Done (top left) button produces the finished graph.
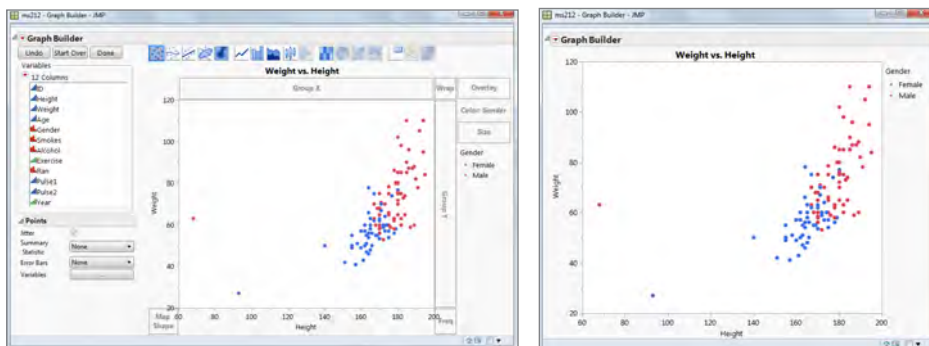

Graph Builder gives you many other options to overlay and stratify data. Additional options for each graph element are available at the bottom left. JMP also has a Map Shape option, which can be used in Graph Builder to create easy visuals that involve maps such as US state data or geocoded data. The JMP approach to data visualization

shines in applications such as Graph Builder, where you have multiple options for interactively exploring data.

After you customize your graph, you can save it in a number of graph formats or export as HTML or PowerPoint. You can also copy and paste it into many outside programs such as Microsoft Word. All JMP output can be copied this way, but the options for saving, editing and copying are hidden by default. New users need to be aware that in Windows you must click on a thin strip at the top of the output to get the hidden menu and toolbars to appear. This option can be changed in the preferences and JMP software points out this hidden dialog after the initial installation.
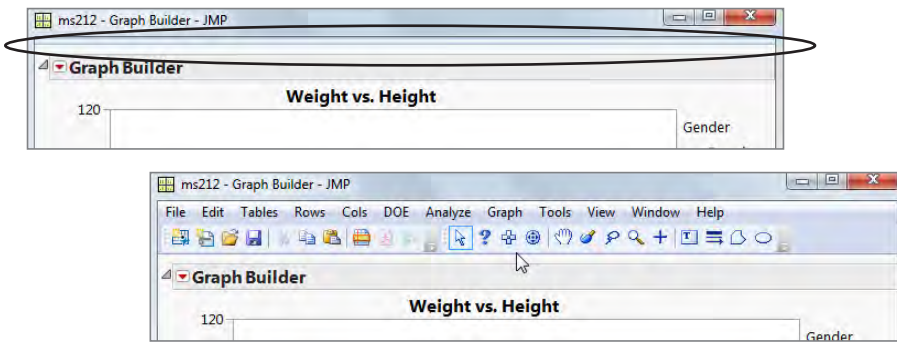
From Graph Builder, we can begin to see how the dynamic linkage in JMP separates it from Minitab. You can click on individual points in these graphs and select them for dynamic analysis. In Minitab we only observed the possible outliers in the graph, and options exist (e.g., the brush tool) to help identify those points, but JMP allows you to easily highlight those individual points and see them in the data and/or other output.
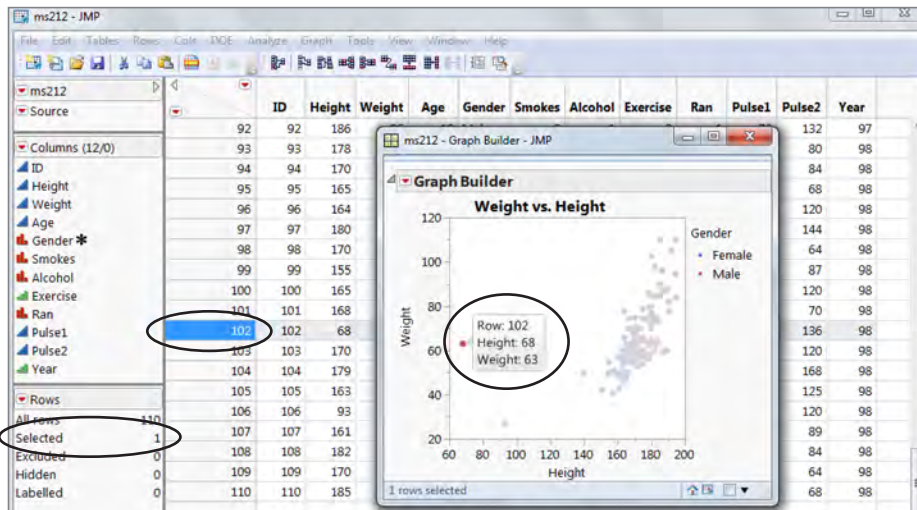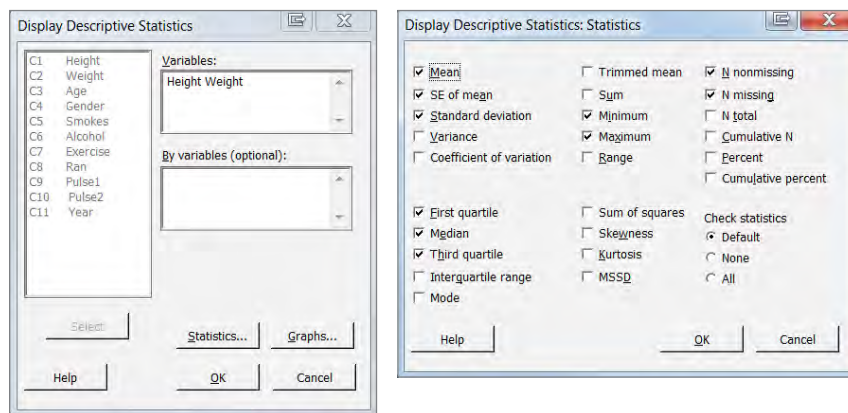
Descriptive statistics

Descriptive statistics is at the heart of any good statistical analysis, and when performed properly, provides insight beyond what is seen in visualizations alone. This section will focus on univariate descriptions of continuous data and creating custom tables. Suppose we want to continue to study the variables Height, Weight and Gender along with Alcohol Use.

Minitab

To obtain basic descriptive statistics for quantitative variables like Height and Weight, you may use the Display Descriptive Statistics option in the Basic Statistics option of the Stat menu. In the example below, you can see how to generate simple descriptive statistics for both Height and Weight:


The statistics requested are displayed in a session window.

Descriptive Statistics: Height, Weight

Variable	N	N*	Mean	SE Mean	StDev	Minimum	Q1	Median	Q3	Maximum
Height	110	0	171.58	1.53	16.08	68.00	165.00	172.50	180.00	195.00
Weight	110	0	66.33	1.45	15.16	27.00	56.00	63.00	75.00	110.00

Minitab has an extensive set of options for creating tables for categorical variables. The Tally Individual Variables option creates univariate output that lists the levels and relative frequencies of individual variables. The Cross Tabulation and Chi-Square option provides two-way table analysis to explore associations between two group variables. The last option, Descriptive Statistics, provides summary statistics for quantitative data across multiple levels of some grouping variable.
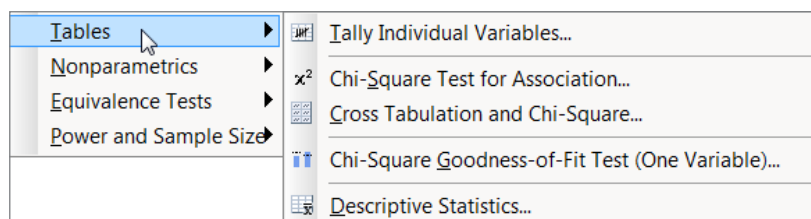
Exploring the Descriptive Statistics feature further you can see the selections needed to find the mean and median weights (in kg) across genders. The tables are straightforward for individuals who know precisely what output is required.
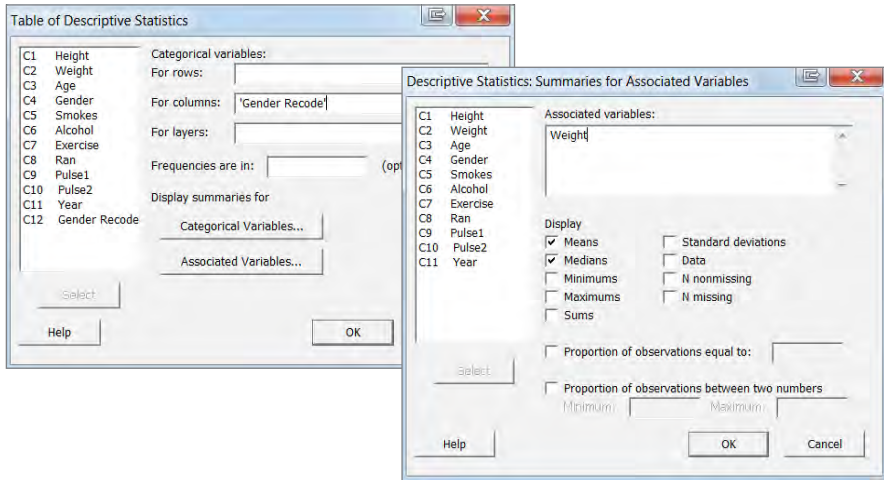
As before, these results are also displayed in the session window.

JMP®

Similar to the Descriptive Statistics option in Minitab, JMP has the Distribution option to obtain simple univariate descriptive output. The Distribution option is found in the Analyze menu. We start by selecting Height and Gender and continue to see that JMP uses the red triangles as a way of manipulating output after we have selected the variables we want to study.
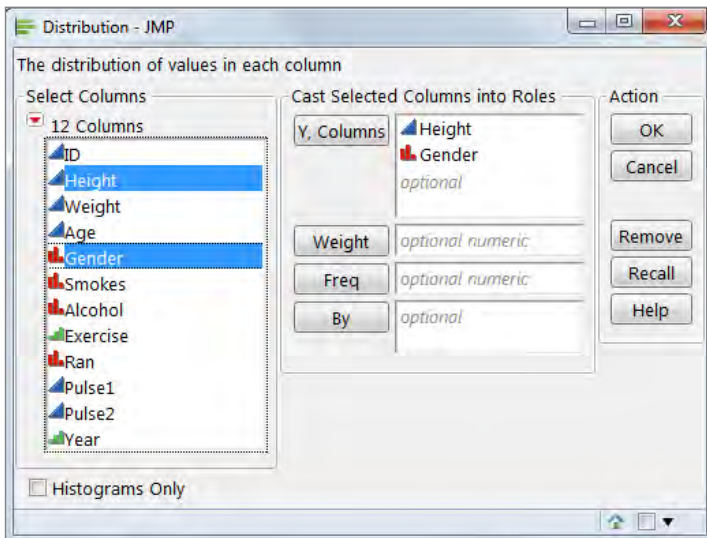
This is a standard distribution output. The default view is vertical, but we've used the Stack option under the top red triangle to display a horizontal view. JMP produces quantiles and summary statistics for continuous variables as well as a 95 percent confidence interval for the mean. For categorical variables, JMP provides a table of frequencies. You also get appropriate graphs alongside the statistical results. In this screenshot, the male subgroup has been selected to highlight the interactivity between different graphs.
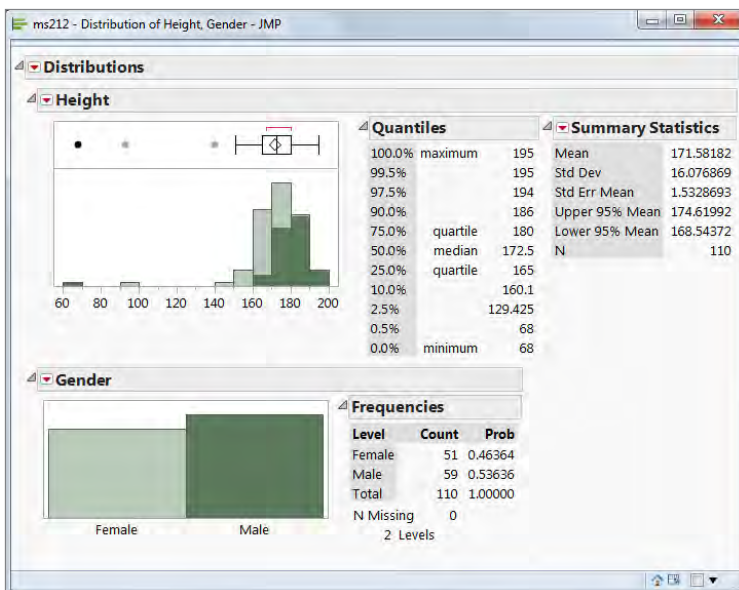
The output here is in stark contrast to typical Minitab output. In Minitab, you must obtain different descriptive output for different variable types (quantitative vs. groups) using different mechanisms. JMP has the option to put all descriptive statistics in the same output window for you to explore.

Using the red triangles for customization, other descriptive measures can be obtained and different distributions can be fit to the data. Options include box plots, normal quantile plots, CDF plots and distribution fits. In addition to added options for descriptive analyses, the summary statistics output contains a red triangle for additional descriptive statistics (skewness, kurtosis, trimmed means, etc.).

Being able to work with the output interactively allows you to fit a variety of theoretical distributions to the data (e.g., normal, exponential, Poisson, binomial, normal mixtures, etc.) and assess their relative fit to the data.

For tabular views of descriptive statistics, JMP provides the Tabulate platform under the Analyze menu. The Tabulate option can build a table interactively, with use and output that is similar in spirit to Graph Builder. You can see computations and output as you customize your table. In addition, the interactive table can be turned off in favor of a traditional dialog if you want to make a very specific output.
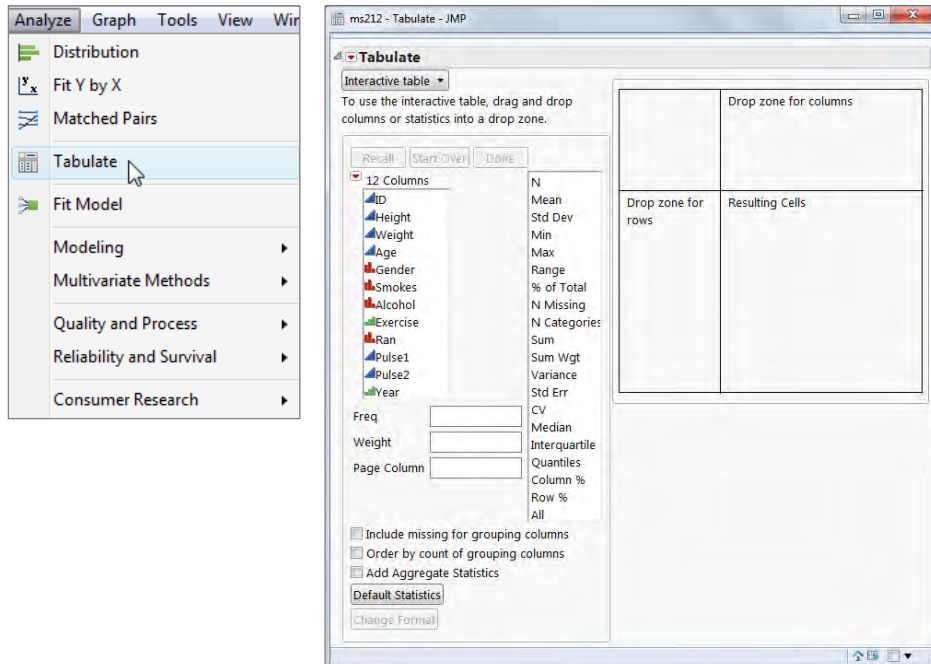
Here we can drag Gender to the column drop zone and then click and drag weight to the row drop zone. Next, we add mean and median as the statistics of choice to obtain the following output (decimals set to two for means with the Change Format option).

	Gender	
	Female	Male
	51	59

		Gender	
		Female	Male
Weight	Sum	2886.5	4410

		Gender	
		Female	Male
Weight	N	51	59
	Mean	56.60	74.75
	Median	56	73

Inference

We now move on from descriptive statistics to general inference between two variables. We will focus on two sample t-tests and chi-square tests of association. In addition to these common methods, both Minitab and JMP have many other great analytic features for descriptive and inferential statistics.

Minitab

Suppose that we want to test whether the average heights significantly differ between men and women. The standard independent samples t-test is a popular option in Minitab, which is found under the Two-Sample t for the Mean in the Basic Stats heading of the Stat menu. Here we can specify one continuous measurement and determine if the mean value of that measurement significantly differs between two groups.
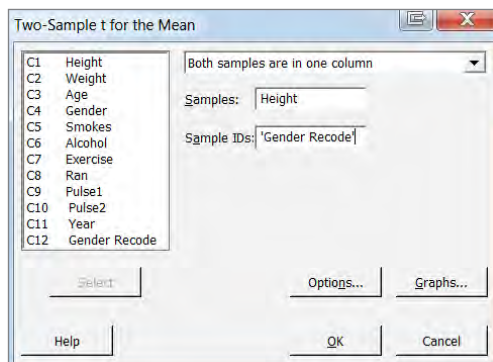
We see that there is a significant difference between the heights of the males and females within this dataset. In Minitab, the unequal variances option is the default and you can specify equal variances in the menu options.

```
Two-Sample T-Test and CI: Height, Gender Recode

Two-sample T for Height

Gender
Recode    N    Mean   StDev  SE Mean
Male     59   177.7   16.3      2.1
Female   51   164.5   12.7      1.8


Difference = μ (Male) - μ (Female)
Estimate for difference:  13.22
95% CI for difference:  (7.74, 18.70)
T-Test of difference = 0 (vs ≠): T-Value = 4.78  P-Value = 0.000  DF = 106
```

Likewise, the calculation of cross-tabulations and chi-square tests for association are straightforward.
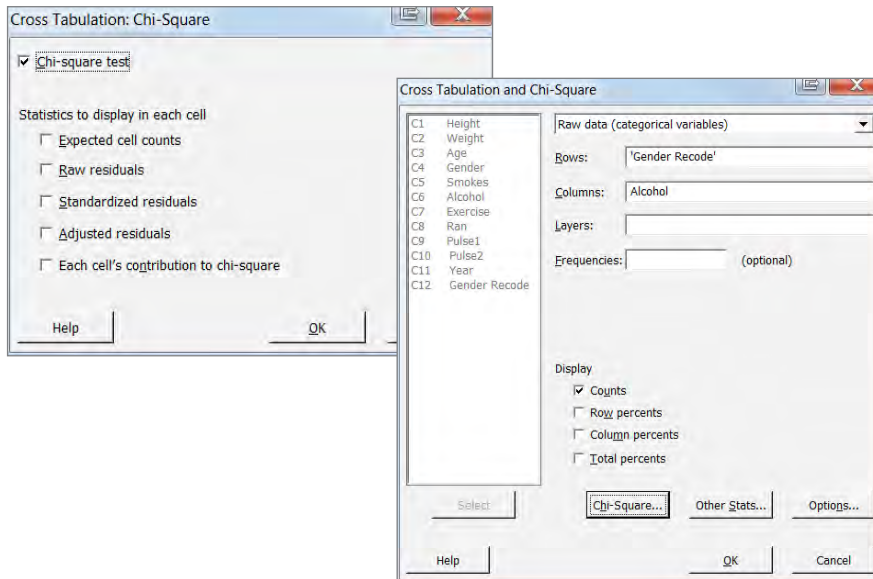
There is no significant association between gender and alcohol use (p = 0.165).

```
Tabulated Statistics: Gender Recode, Alcohol

Rows: Gender Recode    Columns: Alcohol

            1    2   All

Male       40   19    59
Female     28   23    51
All        68   42   110

Cell Contents:      Count


Pearson Chi-Square = 1.927, DF = 1, P-Value = 0.165
Likelihood Ratio Chi-Square = 1.928, DF = 1, P-Value = 0.165
```

As we have seen with other analyses, Minitab supports easy access for individual tests in situations where the analyst knows *exactly* which type of analysis is important and appropriate.

JMP®

In this case, we again see differences in the JMP paradigm for dynamic analysis. Both the t-test and chi-square test are performed using the same platform: the Fit Y by X option under the Analyze menu. We also start to see the importance of specifying variable types.

In the dialog below, note that Gender is listed in the X, Factor column to associate with two responses – Height and Alcohol. JMP software uses the modeling type (Nominal, Ordinal, Continuous) as the mechanism for determining the default output. Also note that the dialog is set up to analyze both the relationship between Gender/Height and Gender/Alcohol. There is no need to run two separate analyses to make these comparisons.
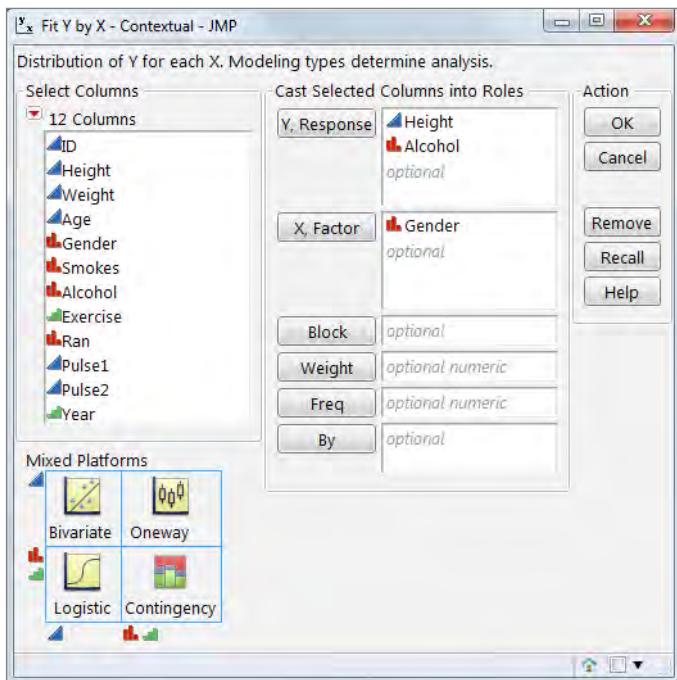

Using the red triangle options, we can easily produce the output below.

Here, we see the main idea in the JMP paradigm. That is, to provide basic output and let you decide to explore different analytic techniques. Need a t-test? That option is available here, and the resulting output is shown on the left in the figure below. Nonparametric options are also available if you discover that the data is skewed in one of the groups being analyzed.

Likewise, the analysis of the association between gender and alcohol starts off as more general. Both likelihood ratio and traditional Pearson chi-square statistics (and p-values) are provided along with Fisher's exact test in two by two tables (shown on the right in the figure below). But additional options such as odds ratios or trend tests are available via the red triangles, which help customize output.

Note that an important option in all analysis dialogs is the recall button, which will repopulate the dialog window with the choices made previously. So if you accidently close the wrong output, it can easily be retrieved.
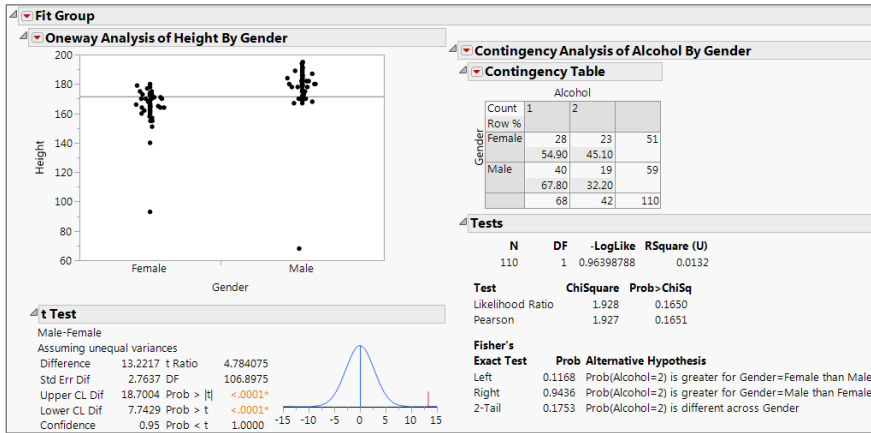

The key point when transitioning from Minitab is that Minitab offers different menu items for each analysis. By contrast, JMP is data-focused and provides context-specific output that you can explore interactively and determine which analytic technique is most appropriate or insightful.

Design of Experiments

A key feature for many Minitab users is the use of the Design of Experiments (DOE) platform. The DOE menus in both Minitab and JMP provide a wide array of features that allow you to create a randomized data table to perform experiments and record data for later analysis. There are many different potential designs available in both software packages. Here, we will design a simple factorial experiment with two factors: A (two levels – high and low) and B (two levels – control and treatment) and three replications of all combinations. A full factorial design here will be 2x2 times 3 runs = 12 total runs.
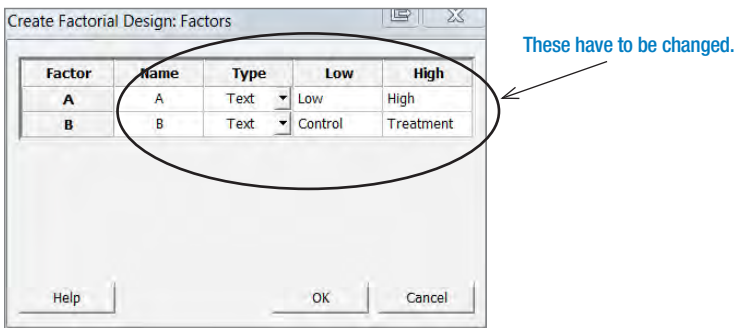
Minitab

To create this design in Minitab, we choose Create Factorial Design in the DOE menu and start by using the default generators and specify a full factorial design with two blocks for Gender.
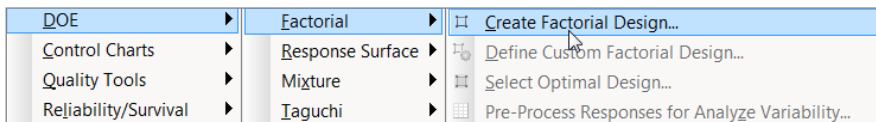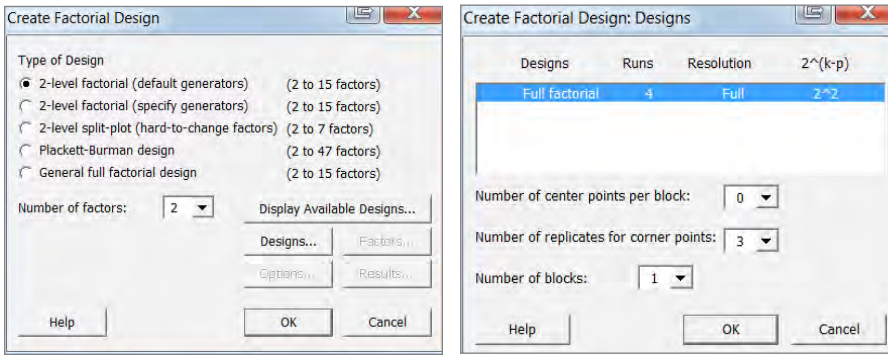
Next we specify the levels for our factors A and B.


These have to be changed.

From this we obtain a worksheet populated with the 12 experimental runs, which are in a randomized order and ready for experimenters to collect their data.

	C1	C2	C3	C4	C5-T	C6-T	C7
	StdOrder	RunOrder	CenterPt	Blocks	A	B	Outcome
1	1	1	1	1	Low	Control	4
2	5	2	1	1	Low	Control	4
3	3	3	1	1	Low	Treatment	8
4	10	4	1	1	High	Control	10
5	6	5	1	1	High	Control	10
6	12	6	1	1	High	Treatment	12
7	8	7	1	1	High	Treatment	15
8	2	8	1	1	High	Control	11
9	9	9	1	1	Low	Control	5
10	11	10	1	1	Low	Treatment	8
11	4	11	1	1	High	Treatment	16
12	7	12	1	1	Low	Treatment	7

Suppose that we add a worksheet column for Outcome with some simple results to illustrate potential results (column C7 above). Minitab users have the option of letting the software analyze the collected data with the appropriate method (here, an analysis of variance model).
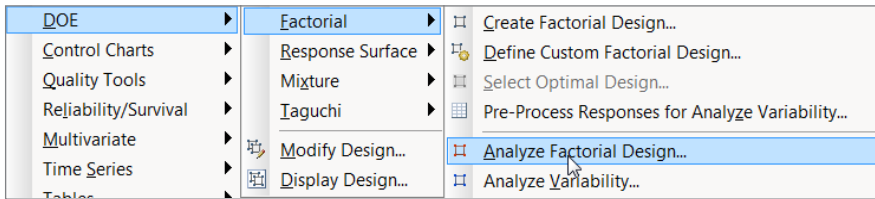
This analysis produces the following output:
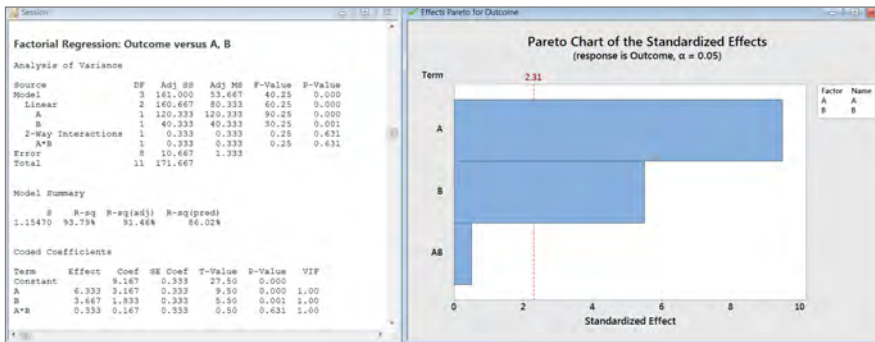
Here we see that there is a significant main effect for both A and B but no significant interaction. Minitab gives ANOVA output, the regression-based coefficients and the appropriate inferential tests.

JMP®

Design of experiments is considered important enough to warrant its own menu heading in JMP. Here we also see a greater array of potential design options. JMP provides not only basic textbook (classical) designs, but also a very large array of novel and custom designs.

Note that selecting the Sample Size and Power option brings up a separate dialog for performing those calculations.
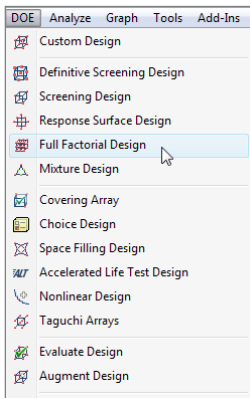

Here we will replicate the factorial design in the last section. Recall the simple factorial experiment with two factors: A (two levels – high and low) and B (two levels – control and treatment) and three replications of all combinations. We start by selecting the Full Factorial Design option.

We have renamed the Response Name to "Outcome" and added two Categorical Factors with two levels (A and B). We have also renamed all the factors and levels to correspond with our naming convention and have asked for three replicates.
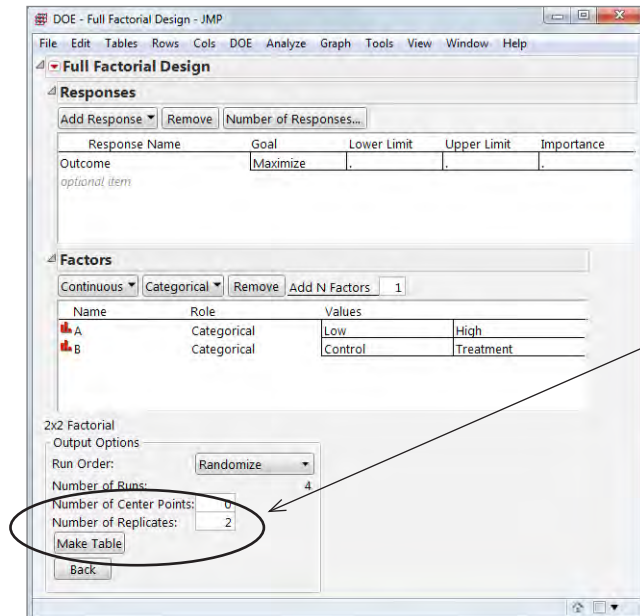

Important Tip: In JMP, the term "Replicates" indicates additional sets of runs. So if you want three total observations for each combination of factor levels, then specify two replicates here (plus the original).

Again by filling in the Outcome variable with values that match the Minitab data set, we have a complete data set for analysis. Like Minitab, JMP provides an easy-to-use mechanism for analyzing the results of designed experiments by attaching script files in the upper-left-hand corner of the data table that performs the appropriate analysis for the chosen design.
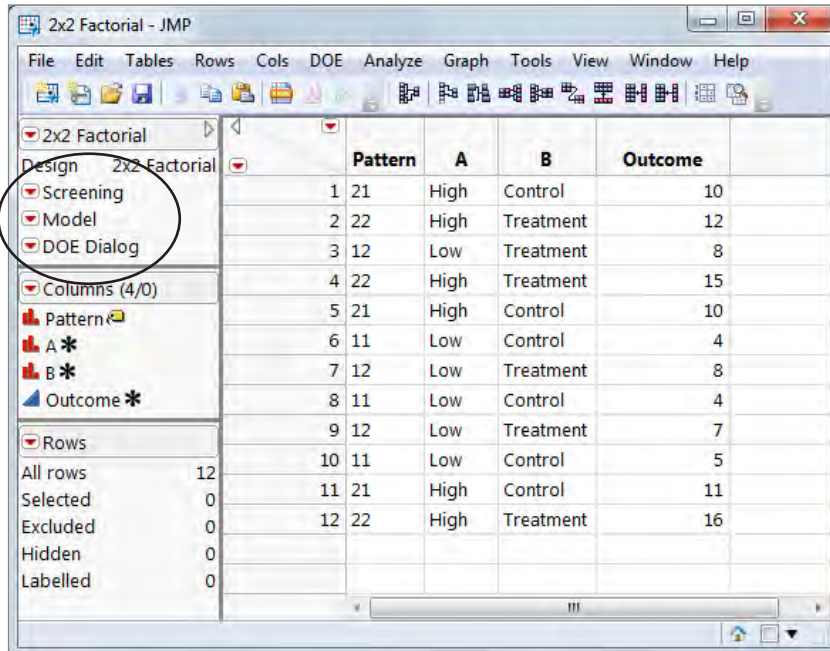

By clicking on the Run Script option beside the red triangle by Model we obtain the Fit Model dialog prepared for analysis. Here the Emphasis was changed to Effect Screening to obtain the output shown below:
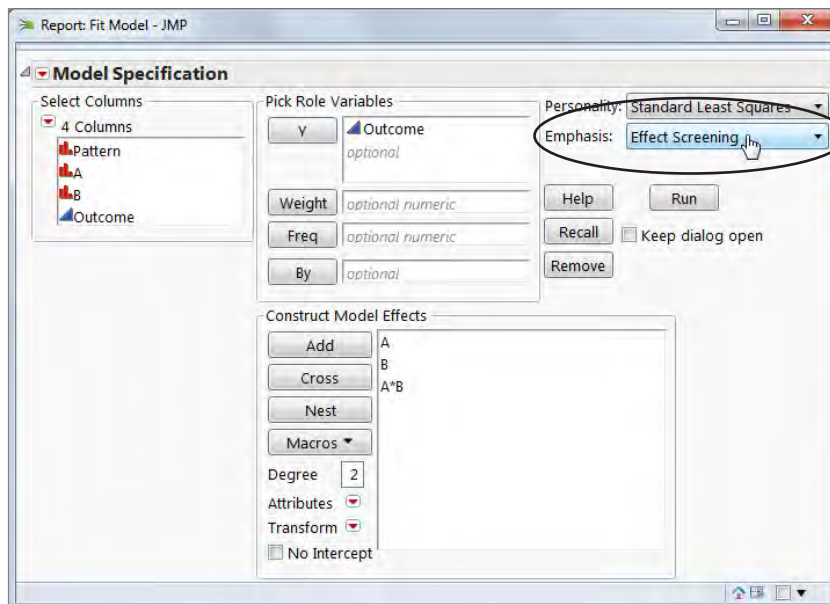
The results here are consistent with the Minitab output with a handful of slight differences (below, left). Note that the ANOVA tests are separated out into the traditional ANOVA table and the effects table for individual effect tests. The parameter estimates table shows which level of each factor is being estimated in the model. So, here the high level of variable A and the treatment level of variable B are the reference groups.

In addition, by specifying the Effect Screening option in the Fit Model dialog we obtain the Prediction Profiler, which is a handy tool for determining the predicted outcome for each combination of factors in our experiment. This tool becomes especially useful with very large models where it is not immediately clear how the variables work together in providing model-based estimates of outcomes.
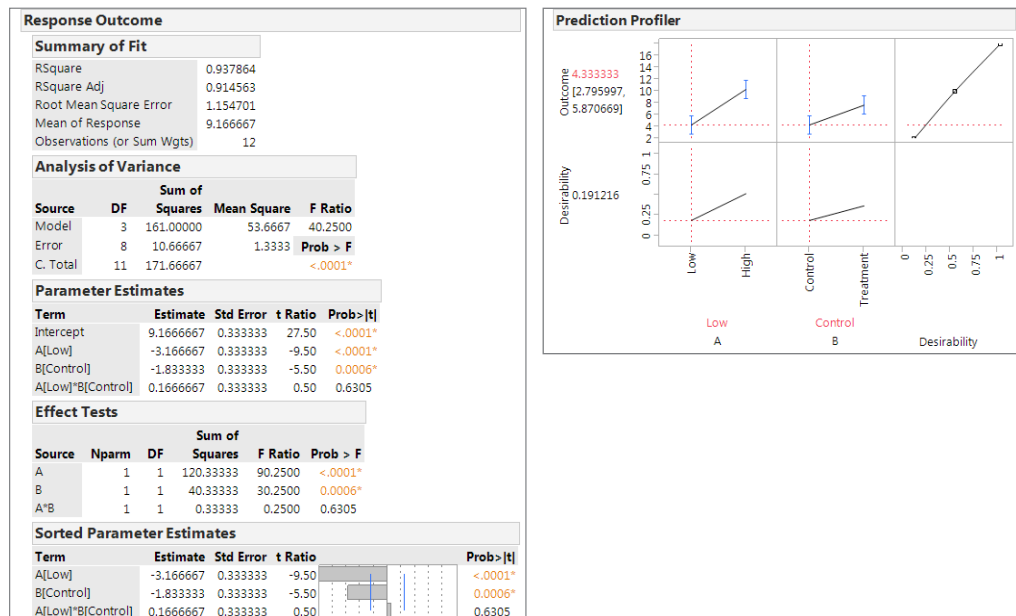
Control Charts

Minitab is an industry leader in the visualization and analysis of quality control data. Quality control comes with its own set of unique visualizations, and some users may fear that a transition to JMP would mean sacrificing functionality in this key area. So let's consider another example where data from a company that manufactures catheters, blood transfusion tubes and other tubing for medical applications.

In this case we would use control charts to ensure that the process is in control and ultimately minimize the scrap produced. In this example, the first prototype runs for nominal 4.4 mm tubing occurred between May 1 and May 20, 2014 (Phase 1). The second prototype, after some adjustments, occurred between May 21 and June 9, 2014 (Phase 2). To examine the differences between Minitab and JMP in this area we will consider a simple but unique feature in quality control, the Xbar and R chart.
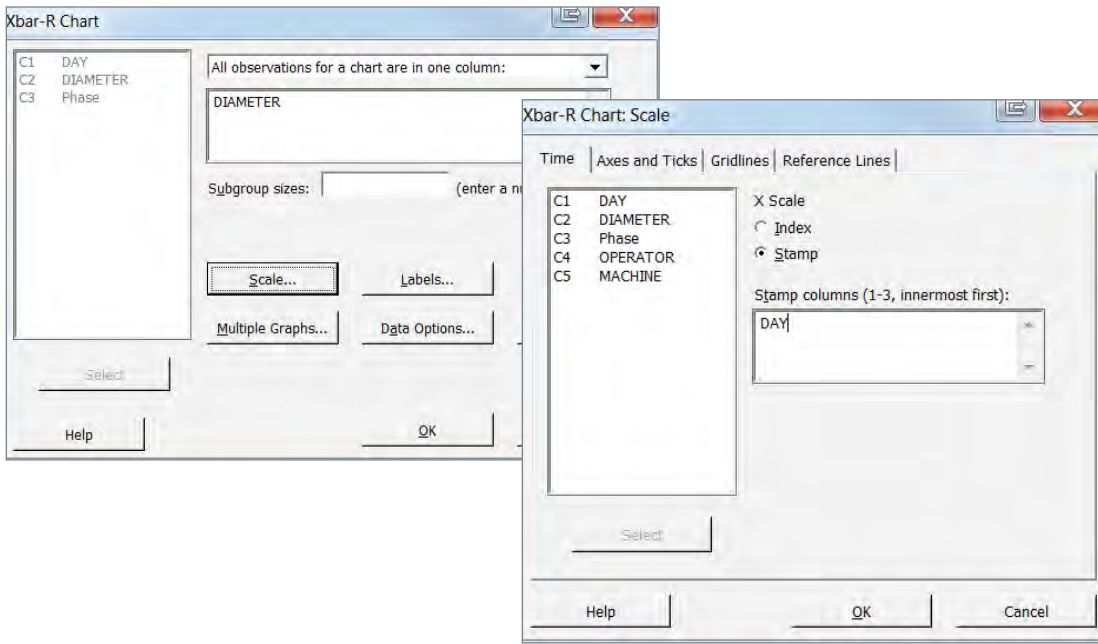
Minitab

The data are straightforward, with day and diameter values for 240 observations. A subset of the data, collected on May 1 and May 2, is shown below:

|	C1-D	C2	C3	C4-T	C5-T
	DAY	DIAMETER	Phase	OPERATOR	MACHINE
1	5/1/2014	3.97951	1	DRJ	A386
2	5/1/2014	4.25553	1	DRJ	A386
3	5/1/2014	4.61697	1	DRJ	A386
4	5/1/2014	3.98198	1	DRJ	A386
5	5/1/2014	4.63753	1	DRJ	A386
6	5/1/2014	4.34473	1	DRJ	A386
7	5/2/2014	3.72676	1	CMB	A386
8	5/2/2014	4.41562	1	CMB	A386
9	5/2/2014	4.45219	1	CMB	A386
10	5/2/2014	5.02473	1	CMB	A386
11	5/2/2014	3.67288	1	CMB	A386
12	5/2/2014	4.61782	1	CMB	A386

DiameterNew ***

An Xbar and R chart may provide a convenient visual for identifying whether there are any unusual observations. Minitab users can find the Xbar-R option under the Control Charts section of the Stat menu.
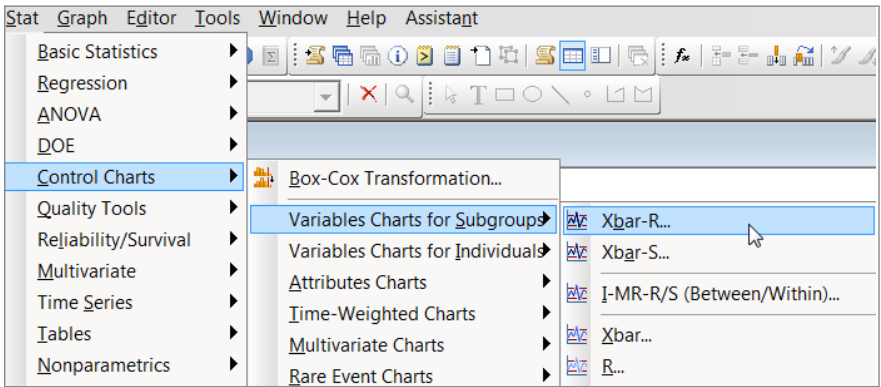
Here we can easily examine diameter values across measurement days by configuring the dialog. Additional options for Scale allow the Day column to also act as the x-axis scale variable.


The standard Minitab output is produced, and we see that the mean diameter is 4.339 with LCL=4.032 and UCL=4.645. Minitab identifies three dates with unusual mean values. The range chart also gives a mean and LCL/UCL values. It also identifies four dates for which unusual observations occur.
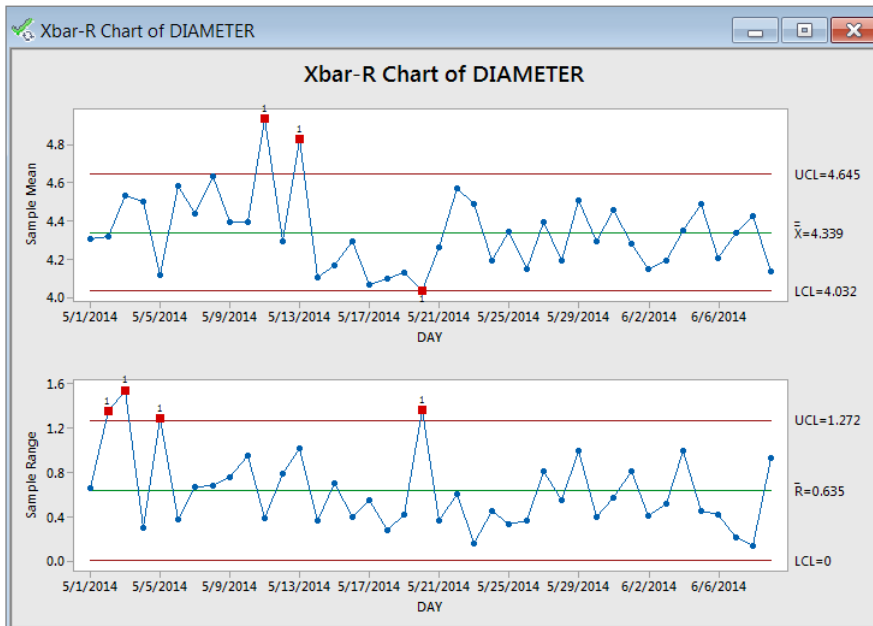
JMP®

In JMP, options for control charts and other quality tools are located in the Quality and Process section of the Analyze menu.
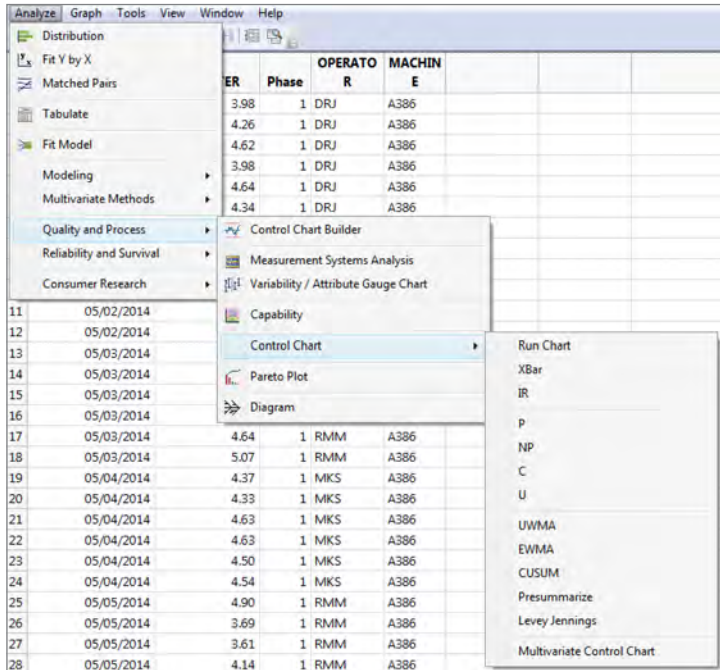

While there is an option for creating Xbar and R or S charts in the Control Chart section (shown above), a relatively new innovation is the Control Chart Builder. In keeping with a common theme of data exploration, Control Chart Builder acts like a Graph Builder for quality control data. This option makes it easy for you to interactively build a control chart of interest.
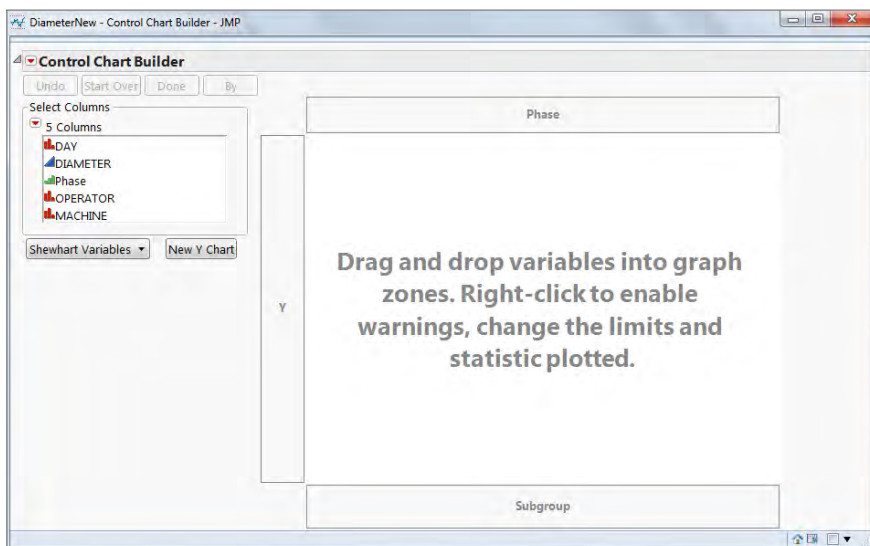
We simply click and drag Diameter to the Y zone to produce a standard Individuals and Moving Range chart. By dragging Day to the Subgroup zone, JMP produces an XBar and R chart. Tests for special causes and other options are found by right-clicking on the graph, and additional customization is available via the options to the left.
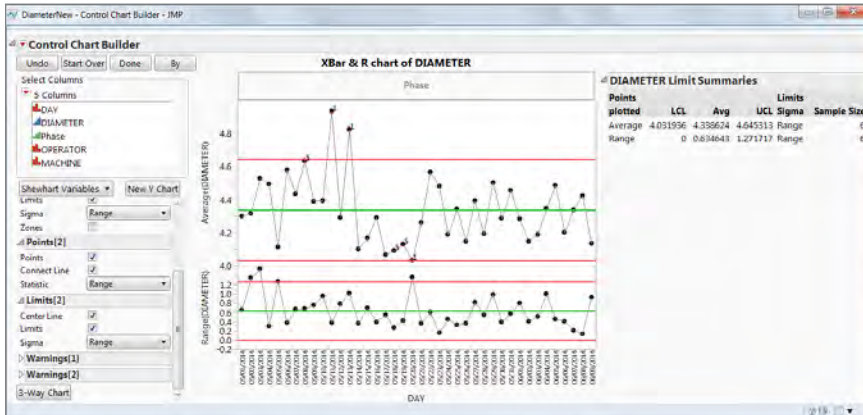
In addition, you can easily add phases or a hierarchical structure to the control chart. When you have finished customizing the control chart, clicking on Done will yield the finished product.
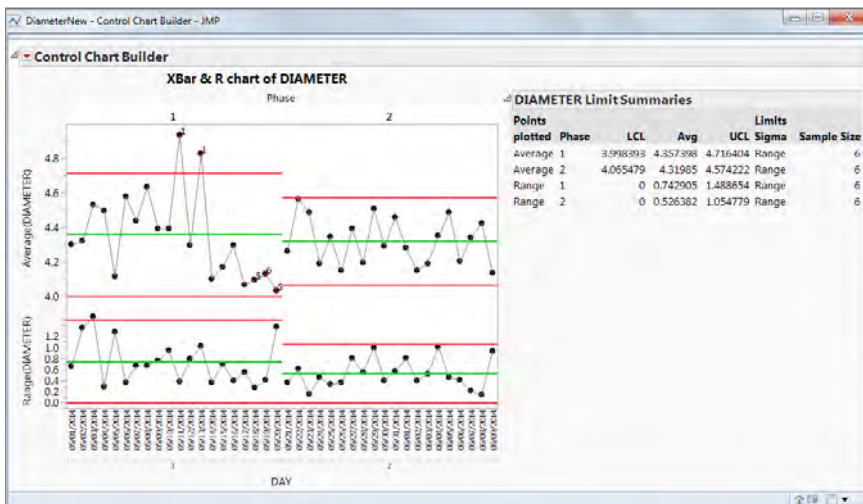
Other features

For those transitioning from Minitab to JMP who are interested in features unique to JMP, there are several options available. JMP comes standard with data mining tools, such as decision trees and neural networks, which are not available in Minitab. While they are advanced features that require some additional reading or training, they can add a completely new level to your data analysis. JMP has features for creating reports, dashboards, add-ins and custom applications that are very popular in many different industries. As we stated earlier, the Graph Builder in JMP contains a mechanism for

easily developing graphics that involve map or geographic data. JMP also has data customization tools such as a column viewer and a data filter, which allow you to work with specific parts or subsets of data without actually creating separate data files.

One key difference between Minitab and JMP is the format for regression modeling procedures. In Minitab each type of regression (ordinary least squares, logistic, partial least squares, etc.) has a separate dialog under the regression area of the Stat menu. In JMP all regression models are found in the Fit Model area under the Analyze menu. Users start by putting together their preferred outcome and predictor variables and then specifying what type of model they wish to build. Options include all those found in Minitab along with additional models such as zero-inflated count and penalized regression models (in JMP Pro), parametric survival models and so on.
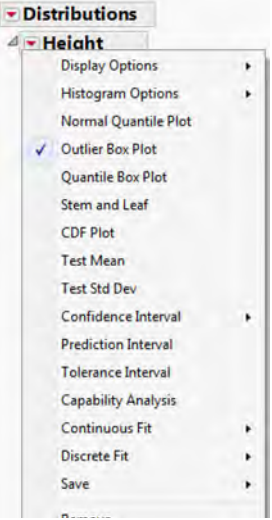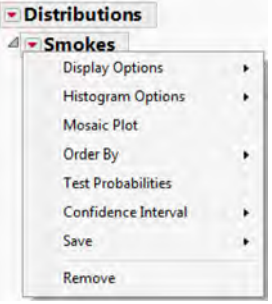
Discussion

Both Minitab and JMP do a great job of analyzing data. The purpose of this guide is to transition users who are familiar with Minitab to creating graphics and performing analysis in JMP. Throughout this guide we have used examples that are independent of either software. Looking across the different platforms and analyses we see a pattern in the overall differences between JMP and Minitab. Minitab is focused on specific analytic methods, with different menus and features corresponding to those methods. JMP, in contrast, dynamically links the data, graphics and output file in order to provide interactive visualizations and analyses. Users start with a general area of analysis and then are allowed to customize output to add different features, graphics or analytic options as needed. This dynamic link between data and output makes exploring unusual observations very simple, and the interactivity of features such as Graph Builder, Data Filter and Column Switcher allow users to create and update visuals in real time.

Finally, interested readers should look at the appendices to this guide with tables that have direct side-by-side comparisons for obtaining basic statistics (Appendix 1) and running some of the more advanced analyses (Appendix 2) in both Minitab and JMP. Note that these appendices do not list all available features or analyses.

Acknowledgements

Special thanks to Mia Stephens and Ben Covington from the JMP Academic and Marketing teams for their edits and insights on all drafts of this document. Also thanks to Ledi Trutna from the JMP Education team, who developed the menu comparison tables found in the Appendix.

Appendix 1: Minitab and JMP Menu Comparisons (Basic Statistics)

Minitab Basic Stat Menu	JMP Platform/Option	JMP Menu Under Analyze > Distribution
Display Descriptive Statistics Store Descriptive Statistics Graphical Summary One Sample Z One Sample t 1 Variance Normality Test	Shown in Analyze > Distribution, or use Col > Columns Viewer Script > Save script to Table Shown in Analyze > Distribution or Graph > Graph Builder Test Mean Test Mean Test Std Dev Continuous Fit > Normal, then Goodness of Fit	
1 Proportion 2 Proportions	Analyze > Distribution, then Test Probabilities Analyze > Fit Y by X (for nominal or ordinal data, does tests for independence or heterogeneity)	
Correlation Covariance and Multiple Correlations	Analyze > Fit Y by X, use the Density Ellipse option under the red triangle Analyze > Multivariate Methods > Multivariate	
Normality Test Outlier Test	Analyze > Distribution, Continuous Fit > Normal Outlier boxplot shown under Analyze > Distribution, or Cols > Modeling Utilities > Explore Outliers (new in JMP 12.	
Goodness of Fit Test for Poisson	Analyze > Distribution, Discrete Fit > Poisson Fitted Poisson > Goodness of Fit (Count Data Only)	

Appendix 2: Minitab and JMP® Menu Comparisons (Advanced)

If You Want This Analysis	Minitab Command	Then Try This in JMP®
Distribution With Summary Statistics	Stat > Basic Statistics > Graphical Summary	Analyze > Distribution
One Sample T Test	Stat > Basic Statistics > One Sample T Test	Analyze > Distribution ⬇ Test Mean
Two Sample T Test	Stat > Basic Statistics > Two Sample T Test	Analyze > Fit Y by X ⬇ Means/Anova/Pooled t
Paired t	Stat > Basic Statistics > Paired t	Analyze > Matched Pairs
Normality Check	Stat > Basic Statistics > Normality Test	Analyze > Distribution ⬇ Fit Distribution > Normal, ⬇ Goodness of Fit
Simple Linear Regression	Stat > Regression > Fitted Line Plot	Analyze > Fit Y by X ⬇ Fit Line
ANOVA	Stat > ANOVA > One-Way	Analyze > Fit Y by X ⬇ Means/ANOVA
Test for Equal Variances	Stat > ANOVA > Test for Equal Variances	Analyze > Fit Y by X ⬇ Unequal Variances
Control Chart	Stat > Control Charts > Variables Charts for Individuals > I-MR	Analyze > Quality and Process > Control Chart Builder
Variability Chart	Stat > Quality Tools > Multi-Vari Chart	Analyze > Quality and Process > Variability/Attribute Gauge Chart
Capability	Stat > Quality Tools > Capability Analysis > Normal	Analyze > Distribution ⬇ Capability Analysis
Box Plot	Graph > Box Plot	Analyze > Distribution for one variable or Analyze > Fit Y by X for boxplots by groups
Many Scatterplots	Graph > Matrix Plot	Graph > Scatterplot Matrix

About SAS and JMP®

JMP is a software solution from SAS that was first launched in 1989. John Sall, SAS co-founder and Executive Vice President, is the chief architect of JMP. SAS is the leader in business analytics software and services, and the largest independent vendor in the business intelligence market. Through innovative solutions, SAS helps customers at more than 65,000 sites improve performance and deliver value by making better decisions faster. Since 1976 SAS has been giving customers around the world THE POWER TO KNOW®.