

# Introduction to Minitab

## Starting Up

In the Start menu, select Programs → Statistics → Minitab 16. You should see a new window, with a Worksheet and a Session subwindow. If the Minitab window takes up your whole screen, you can resize it by double-clicking the top.

## Types of Files

Minitab works with several file types. Data is stored in a simple spreadsheet called a worksheet, with a name ending in “.mtw”. A project file includes the data and all associated calculations and graphs; its name ends in “.mpj”. You want to save your work as a project, so that you don’t have to start from scratch each time. You can either create a new project for each assignment or each problem, depending on how you want to organize your work. The data sets for our homework problems are stored as portable worksheets, with names ending in “.mtp”. If you can’t find a data file where you think it should be, be sure you are displaying all file types.

## Working on a Homework Problem

The data files for the homework are in the following directory, in your “J” drive:

Fileserver1/course/Math/Brown/Stats/Data Files for HW

To begin working on a problem, go to the “File” menu in Minitab. Select “Open **Worksheet**”, then select the “J” (homework) drive. Click on Math → Brown → Stats → Data Files for HW. Set “Files of Type” to “All”. Now you should see a list of Minitab worksheets. Each one corresponds to a homework problem. Most of them have names obviously related to the content of the problem.

When you open a data file, Minitab creates a new project based on it. When you are finished working on the project, click File → Save Project. Choose a name for it, and be sure to save it in your home directory. The next time you want to work on it, you can just double-click the project file and pick up where you left off.

For practice, we’ll work with the reading test score data from Monday’s class. The data is in Table 7.4. Find the appropriate file in the homework drive, and open it in Minitab.

## Minitab Windows

Within Minitab, you should see two windows. The worksheet contains the reading score data. The session window keeps a log of your activities, and prints output from statistical procedures that you perform. You can arrange the windows by moving them around, and you can also control their arrangement using the Window menu. As you work on multiple worksheets and create graphs, you can build up a lot of windows. You can keep your workspace clean by minimizing windows that you don’t currently need (click the bar in the top right corner of the window – not the X; this deletes the window and its contents from your project).

## Structure of Data

Look at how the reading score data is organized. All of the scores are in a single column, called “DRP Score”. Column 1 give the number of each individual, Column 2 records whether they were

in the treatment or control group, and Column 3 records their group using a numerical code. This is how data is always stored in Minitab:

Each row includes all relevant information for a particular individual or trial;

Each column includes all values for a particular variable.

It may be tempting to enter data for different treatments in different columns. Don't do this! Use a column to indicate the group or category of each individual, then store all values for a particular variable in one column.

## Basic Statistics

Let's compute the basic descriptive statistics for the reading scores data. Click on the Stat menu, then select Basic Statistics → Display Descriptive Statistics. Minitab wants to know what variable you want statistics about. Double click "DRP Score"; it should now show up in the Variables box. Click OK. The relevant statistics are now in your Session window. Make sure you can identify the mean, median, standard deviation, and quartiles. Want to know what the "Trimmed mean" is? Click Help → Help to find out (the search tab is useful).

We have statistics for the whole population, but we want to compare the treatments. To get statistics for each group, bring up the Descriptive Statistics window again. This time, click in the "By variables" box, and double click Group to enter it here. Now click OK again, and look at your Session window. You will often use this "By group" approach, so make sure you understand how it worked.

If you want to store the statistics output in the worksheet rather than the session window, you can use Stat → Store Descriptive Statistics.

## Graphs

Let's make some graphs. We'll start with a histogram. Click Graph → Histogram → Simple. We want a histogram of the DRP scores, so double click on that to make it appear in the "Graph variables" box. Click OK. Admire your work, then delete the graph. Create the histogram again, but this time click the Scale button. The most useful thing here is the Y-scale tab, where you can change in from a frequency histogram to a percentage histogram. Also click the Labels button. Under the Data labels tab you click the option "Use y value labels". Click Okay twice to make the new histogram and note the two changes you have made.

Now double click on your histogram. This allows you to modify many aspects of the histogram after you create it. You can play around with colors, etc. More importantly, you can change the number of bins that are used. To do this, click on the "Binning" tab. You can simply change the number of bins, or specify the exact midpoint to use for each bin.

We have a histogram of all the scores, but again we're interested in comparing treatments. Go back to Graph → Histogram → Simple. This time click the Multiple graphs button. Under the By variables tab, you tell it what variable to group the data by (choose "Group") and whether you want a single figure with two panels, or two completely separate graphs. Try both. Also note that under the Multiple variables tab you can tell Minitab to use the same x and y scales for both graphs (this is usually what you want).

Now let's create a side-by-side boxplot to compare the groups. Click Graph → Boxplot → With groups. Put "DRP Score" in the Graph variables box, and "Group" in the Categorical variables

box. Click OK. Neat, huh? Compare the plots to the descriptive statistics in your Session window, to convince yourself that it worked.

Thus far, we have used the "By variables" approach to handle the two groups of reading score data separately. Occasionally, it is useful to separate a single column of data into separate columns, one for each group. This is **not** the usual way to store data, but sometimes it is helpful. To do this, use the command Data → Unstack Columns. We want to "unstack" the Drp data using the "subscripts" from the group column, and store the results in two new columns after the columns we already have. Make sure you know how to do this.

Next, we'll create a scatterplot. Open the worksheet containing Table 2.1, which contains some financial information about NBA teams. Click Graph → Scatter Plot → Simple. Put Value on the y-axis, and Revenue on the x-axis. Click OK.

Let's also compute the correlation of these variables. Click Stats → Basic Statistics → Correlation. Select all three variables, and uncheck the "Display p-values" box. Then click OK. Check your Session window for the results. Does revenue or income (revenue minus expenses) seem more closely connected to a team's value? Does this make any economic sense?

Finally, let's do some linear regression. Go to Stat → Regression → Fitted Line Plot. Enter the explanatory (revenue or income) and response (value) variables, and click OK. Voila! Note that the equation of the regression line is at the top of the graph.

## Saving and Printing

If you are particularly proud of any of your graphs, you can save and print them. Click in the graph you want. Then click File → Print Graph to print it. If you want to save a copy of the graph on the computer, click File → Save Graph As. You can save it in a number of different graphics formats. Microsoft Word and PowerPoint seem to like the TIF format. After you save it to your home space, view the graph outside Minitab to see if it worked. You can also copy paste figures into Word documents.

When you're done, don't forget to save the project in case you want to come back to it. Congratulations – you're a Minitab expert.