










# QI Macros

## For All Versions of Excel 2000-2010 Table of Contents

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|   |   |       |
|---|---|-------|
|   | <b>Installation</b> .....                                 | 2     |
|   | QI Macros Tools .....                                     | 4     |
|   | <b>Data Transformation Tools and Format Tips</b> .....    | 6-9   |
|   | <b>Wizards:</b> Chart, PivotTable and Statistical .....   | 10    |
|    | Pareto Chart .....  | 11    |
|    | Scatter Chart .....                                       | 12    |
|    | Box&Whisker .....   | 13    |
|    | Multi Vari .....  | 13    |
|    | Histogram .....   | 14    |
| <hr/>   |   |       |
|    | <b>Control Charts</b> .....                               | 16    |
|   | Control Chart Wizard .....                                | 16    |
|   | c, np, p, u Charts .....                                  | 17    |
|   | X Charts .....  | 18    |
|   | Stability Rules .....                                     | 20    |
|   | Control Chart Tools Menu .....                            | 21    |
|   | Control Chart Templates .....                             | 23    |
| <hr/>   |   |       |
|  | <b>Fill-In-The-Blank Templates</b> .....                  | 24    |
|   | Flow Charts .....   | 25    |
|  | Ishikawa (Cause-Effect) Diagrams .....                    | 26    |
|  | QFD, GageR&R and DOE .....                                | 27-29 |
| <hr/>   |   |       |
|   | <b>Statistical Analysis Tools</b> .....                   | 30    |
|   | <b>Control Chart Dashboards</b> .....                     | 31    |
|   | Excel Charts .....  | 32    |
| <hr/>   |   |       |
|   | <b>Trouble Shooting</b> .....                             | 33-34 |
|   | <b>Customizing and Enhancements</b> .....                 | 35    |
|   | <b>Free Webinars &amp; Other Training Resources</b> ..... | 36    |

# To Install the QI Macros:

1. **PC:** Double click **QI Macros setup.exe**. For problems with your CD or download, email: support@qimacros.com.
2. **Macintosh:** Copy the contents of the Excel Folder to Microsoft Office (2001-11):Office:Startup:Excel. Note: Excel 2008 does not support macros so only the fill-in-the-blank templates will work with this version of Excel.
3. Open Excel and look for **QI Macros** on Excel's Menu Bar or Ribbon. If the QI Macros menu does not appear, see [www.qimacros.com/techsupport.html#NoMenu2002](http://www.qimacros.com/techsupport.html#NoMenu2002)

File Edit View Insert Format Tools Data Window QI Macros

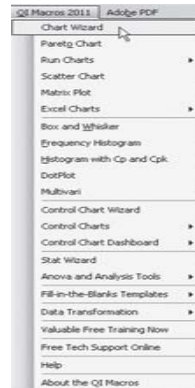
## Excel 2000-2003

### To Run a Chart using a Macro:

1. Select the data to be graphed.
2. Select the graph from the menu bar.
3. Answer prompts for titles & other info.

### To Open a Template:

1. Select Fill-In-The-Blank Templates.
2. Move your cursor over the sub menus and select the desired template.



## Help, Technical Support & Other Resources

Click on QI Macros, then Help to access the QI Macros help menu.

**Technical support** - [qimacros.com/techsupport.html](http://qimacros.com/techsupport.html)

**Frequently asked questions** - [qimacros.com/macroofaq.html](http://qimacros.com/macroofaq.html)

**Overview Videos** - [qimacros.com/qimacros-video-tour.htm](http://qimacros.com/qimacros-video-tour.htm)

**FREE Lessons On Line** emailing [qimacros@aweber.com](mailto:qimacros@aweber.com).

**FREE Webinars** - [qimacros.com/webinars/webinar-dates.html](http://qimacros.com/webinars/webinar-dates.html)

## About this User Guide

This booklet covers use of the QI Macros. It will *not* cover Excel, SPC, or Six Sigma. See [www.qimacros.com](http://www.qimacros.com) for other resources addressing these topics.

# Excel 2007-10 Menu Options:

Excel 2007-10 have a different user interface from previous versions of Excel called "the ribbon." To simplify your life, we offer both an Excel 2007 ribbon interface and the Classic Excel 2003 menu. You will be prompted to choose between the interfaces during installation.

## Excel 2007-2010 Ribbon

When properly installed the QI Macros will appear in the far right part of the ribbon.



Click on QI Macros to reveal the QI Macros functions. If you look from left to right you should see: Statistical Tools, Fill-In-The-Blanks Templates, Data Transformation, Capability Charts, Control Charts and Improvement Charts. Any menu item with an arrow to the right has a pull down menu of further options.



## Classic 2003 Menu

While the new ribbon interface may be easier for new users to learn, it can be challenging for those of us who have been using Excel for years. So, to simplify the transition, we created a "classic Excel 2003 menu" with all of the Excel tools and buttons, as well as the QI Macros Pull Down Menu. To access this menu click on QI Macros and the following will appear:



Click on QI Macros to access its functions and other menu items to access Excel's functions the way you did in previous versions of Excel.

# Tools in the QI Macros

## Introduction

The QI Macros SPC Software for Excel consists of five parts.

- |                      |   |
|----------------------|---|
| <b>1. Macros</b>     | Control Charts, Histograms, Line, Run, Scatter, Pareto, Bar, Pie, BoxWhisker, Multivari             |
| <b>2. Templates</b>  | SPC Charts, Flowcharts, Fishbones, Gage R&R, DOE & QFD, FMEA & PPAP, Value Stream Map               |
| <b>3. Statistics</b> | ANOVA, F test, t test, Chi Squared, Correlation, Regression, Sample Size                            |
| <b>4. Data</b>       | Pivot Table Wizard, Count Words, Stack/Re-Stack Tables, Get Sample from Table, Paste/Link Transpose |
| <b>5. Wizards</b>    | Chart, Control Chart, PivotTable and Statistics   |

**90% of common problems can be diagnosed with control charts, pareto charts, and Ishikawa diagrams.** The QI Macros can be used to create all of these charts, graphs, forms and tools.

## Excel Workbooks—Entering your data.

Other software packages make you transfer your Excel data into special tables, but not the QI Macros. Just put your data in a standard Excel worksheet. The simplest format for your data is usually one column of labels, and one or more columns of data.

|   | A   | B       | C       | D       |
|---|-----|---------|---------|---------|
| 1 |     | Plant 1 | Plant 2 | Plant 3 |
| 2 | Jan | 15      | 77      | 44      |
| 3 | Feb | 23      | 56      | 33      |
| 4 | Mar | 56      | 33      | 55      |
| 5 | Apr | 33      | 33      | 22      |

**Sample Data:** The QI Macros loads sample data on your computer at c:\qimacros\testdata. There is sample data for each chart. Use this data for examples of how to set up your data and to practice running charts.

Watch "how to videos" for many QI Macros tools at [www.qimacros.com/qimacros-video-tour.htm](http://www.qimacros.com/qimacros-video-tour.htm)

# Run a Macro using the Menus

- 1. Input your Data into an Excel Worksheet:** The simplest format for your data is usually one column and one row of labels, and one or more columns of data (e.g., samples).

Date/Labels  
↓

|   | A             | B      | C      | D      | E      | F      |
|---|---------------|--------|--------|--------|--------|--------|
|   | Sample Number | Obs 1  | Obs 2  | Obs 3  | Obs 4  | Obs 5  |
| 1 | S1            | 74.030 | 74.002 | 74.019 | 73.992 | 74.008 |
| 2 | S2            | 73.995 | 73.992 | 74.001 | 74.011 | 74.004 |
| 3 | S3            | 73.988 | 74.024 | 74.021 | 74.005 | 74.002 |
| 4 | S4            | 74.002 | 73.996 | 73.993 | 74.015 | 74.009 |
| 5 | S5            | 73.992 | 74.007 | 74.015 | 73.989 | 74.014 |

← Defects/Samples

**Tips:** Only select one column and row of labels. Each chart requires a certain number of columns of data to run properly:

| Required number of columns of data: |           |           |               |
|-------------------------------------|-----------|-----------|---------------|
| 1                                   | 1 or more | 2         | 2 or more     |
| Pareto                              | XmR       | Scatter   | Box & Whisker |
| Pie, Run                            | Histogram |           | Multivari     |
| c, np, XmR                          | Freq Hist |           |               |
| Levey Jennings                      | EWMA      | u Chart   | XbarR         |
| Moving Avg                          | Cusum     | p Chart   | XbarS         |
| Dot Plot                            | XmedianR  | Hotelling | Matrix Plot   |

- 2. Select Your Data:** Use your mouse to click-and-drag to select the data you want to graph. (Hint: don't select the whole column or row, just the cells you want to graph.)
- 3. Select Your Chart:** Click on the QI Macros pull-down menu and select the Chart Wizard or the chart you want to run.
- 4. Answer the Prompts:** Most charts will prompt you for titles and other information to complete the chart.
- 5. Review and Save Your Workbook:** When the macro is done you will have a workbook with 3 sheets: your data, the chart and an intermediate spreadsheet where you can view the calculations. Don't forget to save your workbook.

# Data Format & Selection Tips

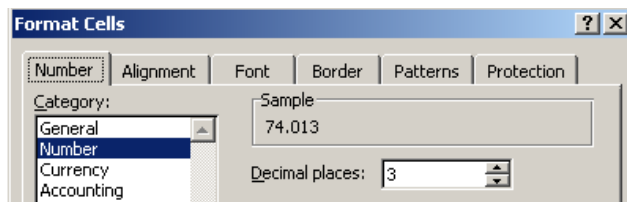
1. **To highlight cells from different columns** (as shown). Click on the top left cell and drag the mouse down to include the cells in the first row or column. Then, hold down the Control Key, while clicking and highlighting the additional rows or columns.

|   | A   | B       | C       | D       |
|---|-----|---------|---------|---------|
| 1 |     | Plant 1 | Plant 2 | Plant 3 |
| 2 | Jan | 15      | 77      | 44      |
| 3 | Feb | 23      | 56      | 33      |
| 4 | Mar | 56      | 33      | 55      |
| 5 | Apr | 33      | 33      | 22      |
| 6 | May | 77      | 23      | 66      |
| 7 | Jun | 33      | 15      | 11      |
| 8 | Jul | 14      | 14      | 77      |

2. **You may also use data in horizontal rows.** Click on the top left cell and drag the mouse down and right to include the cells in the horizontal rows.

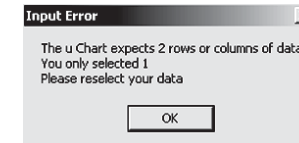
|    | A       | B   | C   | D   | E   |
|----|---------|-----|-----|-----|-----|
| 10 |         |     |     |     |     |
| 11 |         | Jan | Feb | Mar | Apr |
| 12 | Plant 1 | 15  | 23  | 56  | 33  |
| 13 | Plant 2 | 77  | 56  | 33  | 33  |
| 14 | Plant 3 | 44  | 33  | 55  | 22  |

3. **Numeric data and decimal precision:** Excel formats most numbers as "General" not "Number". If you do not specify the format for your data, Excel will choose one for you. To get the desired precision, select your data, choose Format-Cells-Number and specify the number of decimals:

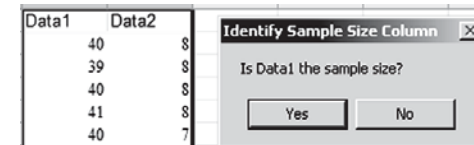


# Common Error Messages:

Many charts require more than one column of data. If you only select one column of data and then select one of these charts you will receive the following error message.



The u chart assumes that your defects column is to the left of your sample size column. If the columns are reversed (larger #s on the left), the macros will ask you if the left column is the sample size.



# Formatting Excel Charts:

Once you create a chart, you can use any of Excel's menus and commands to enhance or format your chart. Just select the item to format and then right click to view the options available.

**Add Text boxes, arrows or other** - Use Excel's drawing toolbar to add text boxes, arrows or other symbols to your chart. To view the drawing toolbar, select View/Toolbars/Drawing. The drawing toolbar usually appears on the bottom of the worksheet.



**Put two charts on the same worksheet** - Click on your chart, then select Edit-Copy. Then click in the destination worksheet and select Edit-Paste.

**For Other Chart Options** - Click on the Chart pull down menu.

See [www.qimacros.com/free-excel-tips/format-charts.html](http://www.qimacros.com/free-excel-tips/format-charts.html) for further information on how to format your charts.

# Data Transformation Tools

The QI Macros Data Transformation Tools help you analyze your data and reorganize it to run a chart.

**Pivot Table Wizard** makes it easier to run Pivot tables. Just select up to 4 columns of data and select the wizard.

**Count Words in a Table** will count the number of times a word or two word phrase appears in your data.

**Stack/Restack** increases or decreases the number of columns your data is organized into. It can take one column of data and "stack" it into multiple columns or it can take multiple columns of data and restack it into one column. It can also convert 2 columns to 3 or 4 columns to 2, etc. Just select your data, then click on stack restack and answer the prompt about how many new columns you desire.

**Get Sample** selects a sample from a table of data. Select the data, then select Get Sample. The macro will prompt you for the # of samples and whether you want a Random or Periodic sample. A periodic sample of 3 will give you every 3rd item from your data.

**Paste Link/Paste Link Transpose:** Excel lets you paste link and paste transpose but it doesn't let you do both at the same time. Use these functions to link your data to a QI Macros fill-in-the-blanks template. Update your data sheet and the template and chart are automatically updated. Use these function to build dashboards.

**Box Cox Transformation** multiplies the selected data by a transformation factor. The purpose is to transform non-normal data into data that is closer to normal.

See [www.qimacros.com/free-excel-tips/data-transformation.html](http://www.qimacros.com/free-excel-tips/data-transformation.html) for further information on these tools.

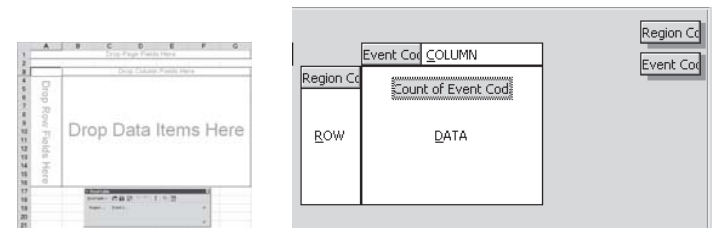
# Summarize Your Data

The QI Macros only draw graphs; they won't summarize your data. The PivotTable Wizard or Excel's Pivot Table tool will help you summarize your data just about any way you want.

1. To use the PivotTable Wizard, click on up to four column headings. Otherwise, select the labels and data to be summarized, in this case, event codes by region. Many processes and gages produce one code or measurement each time an event happens. These often need to be summarized to simplify your analysis.

|   | A           | B          |
|---|-------------|------------|
|   | Region Code | Event Code |
| 1 | 002         | 100        |
| 2 | 001         | 94         |
| 3 | 001         | 4          |
| 4 | 001         | 122        |

2. From Excel's menu, choose: **Data-Pivot Table**. Follow the Pivot-Table Wizard until you get a screen like one of these:



3. Click and drag the data labels into the appropriate area of the pivot table to get the summarization you want:

|    | A                   | B     | C   | D   | E   | F   | G   | H   | I   | J   | K   | L  |   |
|----|---------------------|-------|-----|-----|-----|-----|-----|-----|-----|-----|-----|----|---|
| 1  | Count of Event Code | Event |     |     |     |     |     |     |     |     |     |    |   |
| 2  | Region Code         | 1     | 2   | 3   | 4   | 5   | 6   | 8   | 9   | 10  | 11  | 1  |   |
| 3  | 001                 | 4     | 376 | 51  | 157 | 34  | 240 | 43  | 87  | 255 | 2   | 1  |   |
| 4  | 002                 | 1     |     | 93  | 86  | 17  | 12  | 7   | 9   | 17  | 9   |    |   |
| 5  | 003                 | 1     | 2   |     |     | 2   |     | 23  |     |     |     |    |   |
| 6  | 004                 | 2     | 4   | 1   | 1   | 16  |     | 2   |     |     | 3   |    |   |
| 7  | 019                 | 1     |     |     | 2   | 4   |     |     | 1   |     |     |    |   |
| 8  | 020                 |       |     | 5   |     | 7   |     | 1   | 29  | 11  |     |    |   |
| 9  | 029                 | 1     |     |     |     | 14  | 13  |     | 5   |     |     |    |   |
| 10 | 035                 |       | 9   | 33  | 2   | 24  | 63  | 38  | 116 | 5   | 7   | 1  |   |
| 11 | 038                 |       | 2   | 3   |     | 4   | 1   | 57  | 2   | 1   | 3   |    |   |
| 12 | 053                 | 1     | 77  | 69  | 20  | 81  | 194 | 49  | 236 | 146 | 7   | 3  |   |
| 13 | Grand Total         |       | 11  | 470 | 255 | 268 | 203 | 523 | 220 | 485 | 435 | 31 | 6 |

4. To change how the data is summarized, use the pivot table wizard or double click on the top left-hand cell. For online tutorials, Google "Excel Pivot Table".
5. Select labels and data to draw charts using your data.



# QI Macros Wizards

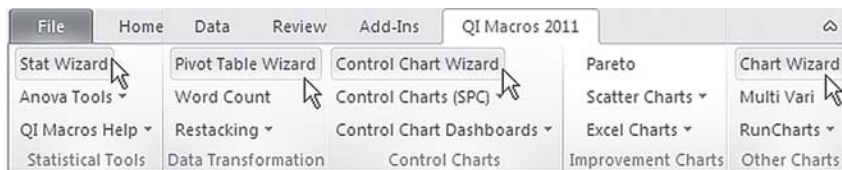
The QI Macros is the only Six Sigma SPC software that provides Wizards to automatically choose charts based on your data.

We have found that beginning and even experienced Six Sigma users aren't always sure what chart or tool to use. Because users select their data before they draw a chart or run a statistic, the QI Macros can easily determine the best charts, statistics or organization for the data.

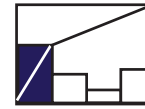
The QI Macros have several wizards to assist in choosing the right chart or statistic:

- **Chart Wizard** - chooses the right charts for your data: descriptive statistics, pareto charts, control charts, histograms, box and whisker charts, scatter charts, etc.
- **Control Chart Wizard** - chooses a control chart: c, np, p, u, XmR, XbarR, or XbarS.
- **PivotTable Wizard** - summarizes up to four columns of data.
- **Statistics Wizard** - to automate hypothesis testing: normality, F test, t test, ANOVA, etc.

1. Highlight the labels and data to be graphed, then click on the QI Macros menu and then select the appropriate wizard.



2. The QI Macros Wizards will automatically draw all of the graphs or statistics required. The PivotTable will summarize the data based on the number of columns selected.



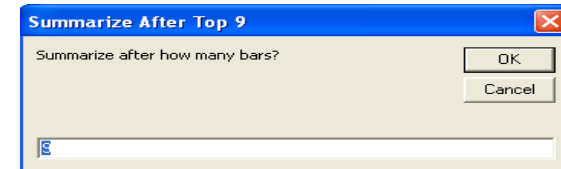
# Create Pareto Charts:

1. **Highlight the labels and one or more columns of data (you will get a separate pareto for each data column):** labels in the left-hand column, data in the right-hand column.

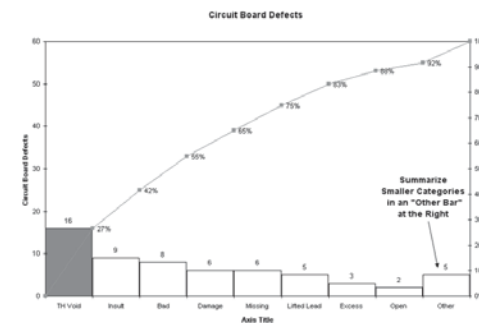
Pareto charts are a combination line chart and bar graph. They help narrow your focus to simplify problem solving.

|    | A                  | B                   | C                   | D                    |
|----|--------------------|---------------------|---------------------|----------------------|
|    |                    | Med Errors Baseline | Med Errors 6 months | Med Errors 18 months |
| 1  |                    |                     |                     |                      |
| 2  | Drug not available | 3                   | 5                   | 4                    |
| 3  | Extra Dose         | 1                   | 3                   | 2                    |
| 4  | Omission           | 0                   | 2                   | 0                    |
| 5  | Unauthorized Drug  | 0                   | 2                   | 1                    |
| 6  | Wrong Dose         | 5                   | 1                   | 2                    |
| 7  | Wrong Form         | 3                   | 0                   | 0                    |
| 8  | Wrong Route        | 5                   | 1                   | 0                    |
| 9  | Wrong Technique    | 41                  | 25                  | 5                    |
| 10 | Wrong Time         | 33                  | 13                  | 16                   |

2. **From the QI Macro Menu bar select Pareto Chart.** If you have more than 9 data points, the macros will ask you how many bars you want before you summarize the miscellaneous ones into an "Other" bar. Input the number of bars and then click "OK."



Sample Pareto chart with an "Other" Bar.



If you want to add data, consider using the Pareto template instead of the macro. Watch video of a pareto chart being created at [qimacros.com/qiwizard/pareto-chart-video.html](http://qimacros.com/qiwizard/pareto-chart-video.html)

# Create a Scatter Chart:



1. Highlight the labels and data to be graphed.

Scatter charts can help confirm your suspicions about cause and effects.

Scatter charts require two columns of data.

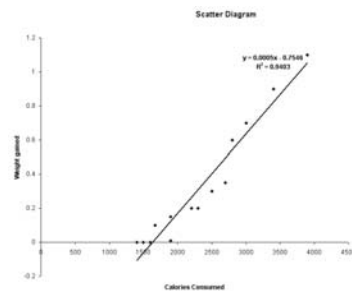
If  $R^2 > .8$ , most statistics books imply there is a strong correlation.

| A         | B        |
|-----------|----------|
| Cases (x) | Time (y) |
| 7         | 16.68    |
| 3         | 11.50    |
| 3         | 12.03    |
| 4         | 14.88    |
| 6         | 13.75    |
| 7         | 18.11    |
| 2         | 8.00     |
| 7         | 17.83    |
| 5         | 21.50    |
| 10        | 21.00    |

2. From the QI Macro Menu bar select "Scatter Diagram."

3. The macro will create a scatter diagram with y and  $R^2$  metrics. Other metrics can be found on the scatter data worksheet.

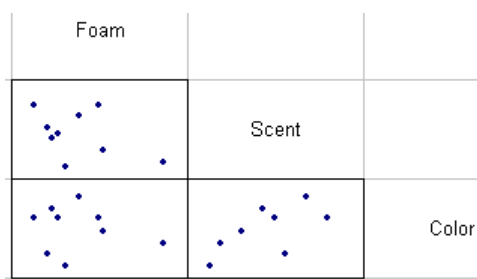
Watch video at [qimacros.com/qiwizard/scatter-plot-video.html](http://qimacros.com/qiwizard/scatter-plot-video.html)



# Create a Matrix Plot:

You can also use a Matrix Plot to evaluate the correlation and cause effect between two or more variables.

| Foam | Scent | Color |
|------|-------|-------|
| 6.3  | 5.3   | 4.8   |
| 4.4  | 4.9   | 3.5   |
| 3.9  | 5.3   | 4.8   |
| 5.1  | 4.2   | 3.1   |
| 5.6  | 5.1   | 5.5   |
| 4.6  | 4.7   | 5.1   |
| 4.8  | 4.8   | 4.8   |
| 6.5  | 4.5   | 4.3   |
| 8.7  | 4.3   | 3.9   |



# Create a Box & Whisker:



1. Highlight the labels and data to be graphed.

|        | Cavity 1 | Cavity 2 | Cavity 3 | Cavity 4 |
|--------|----------|----------|----------|----------|
| Top    | 0.2522   | 0.2501   | 0.2510   | 0.2489   |
| Middle | 0.2523   | 0.2497   | 0.2507   | 0.2481   |
| Bottom | 0.2518   | 0.2501   | 0.2516   | 0.2485   |
| Top    | 0.2514   | 0.2501   | 0.2508   | 0.2485   |
| Middle | 0.2513   | 0.2494   | 0.2495   | 0.2478   |
| Bottom | 0.2505   | 0.2495   | 0.2507   | 0.2484   |
| Top    | 0.2518   | 0.2498   | 0.2516   | 0.2494   |
| Middle | 0.2512   | 0.2484   | 0.2496   | 0.2485   |
| Bottom | 0.2501   | 0.2492   | 0.2507   | 0.2492   |
| Top    | 0.2520   | 0.2499   | 0.2503   | 0.2483   |
| Middle | 0.2514   | 0.2495   | 0.2501   | 0.2482   |
| Bottom | 0.2513   | 0.2501   | 0.2504   | 0.2491   |
| Top    | 0.2524   | 0.2488   | 0.2511   | 0.249    |
| Middle | 0.2518   | 0.2486   | 0.2504   | 0.2479   |
| Bottom | 0.2512   | 0.2497   | 0.2503   | 0.2488   |
| Top    | 0.2517   | 0.2496   | 0.2503   | 0.2485   |
| Middle | 0.2508   | 0.2487   | 0.2497   | 0.2483   |
| Bottom | 0.2513   | 0.2500   | 0.2492   | 0.2495   |

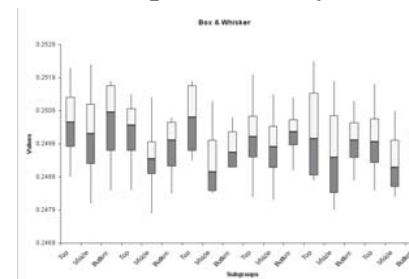
Box and Whisker plots help show the dispersion of data over time. Each bar is like a histogram turned on its side.

This chart requires 2 or more columns of data.

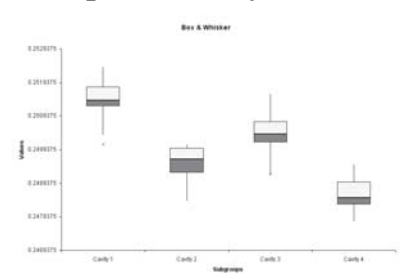
2. From the QI Macro Menu bar select Box and Whisker.

The Box and Whisker macro will ask whether your data is grouped in rows or columns. The data above has 18 rows and 4 columns.

Graph if select by Rows



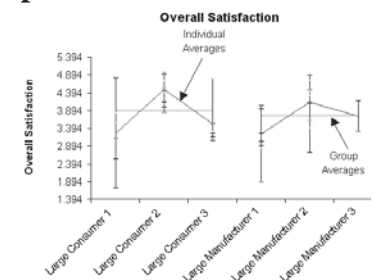
Graph if select by columns

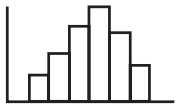


# Create a Multivari Chart:

The Multivari Chart summarizes data based on labels (A:C) and plots the averages and data points:

|   | A                | B            | C             | D                    |
|---|------------------|--------------|---------------|----------------------|
| 1 | Size of Customer | Product Type | Customer Type | Overall Satisfaction |
| 2 | Small            | Consumer     | 2             | 3.54                 |
| 3 | Large            | Consumer     | 3             | 3.16                 |
| 4 | Small            | Manufacturer | 2             | 2.42                 |
| 5 | Large            | Manufacturer | 2             | 2.7                  |
| 6 | Small            | Consumer     | 3             | 3.31                 |
| 7 | Large            | Consumer     | 2             | 4.12                 |



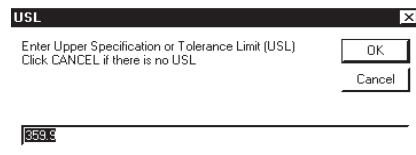


# Create a Histogram:

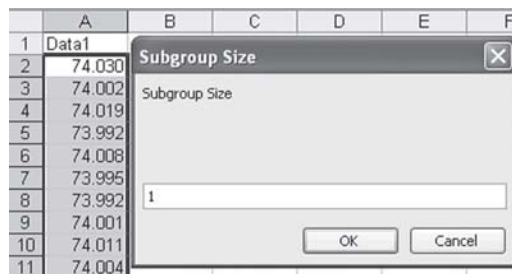
1. **Make sure the cells are formatted to the correct decimal precision.** Right click on cells and select Format-Cells, select Number and specify the number of decimal places you want.
2. **Highlight the labels and data to be graphed** (a minimum of 20 data points is recommended). Click on the top data cell and drag the mouse down to include just the data cells. **Tip:** Do NOT sort your data before running a histogram.

| A             | B      | C      | D      | E      | F      |
|---------------|--------|--------|--------|--------|--------|
| Sample Number | Obs 1  | Obs 2  | Obs 3  | Obs 4  | Obs 5  |
| S1            | 74.030 | 74.002 | 74.019 | 73.992 | 74.008 |
| S2            | 73.995 | 73.992 | 74.001 | 74.011 | 74.004 |
| S3            | 73.988 | 74.024 | 74.021 | 74.005 | 74.002 |

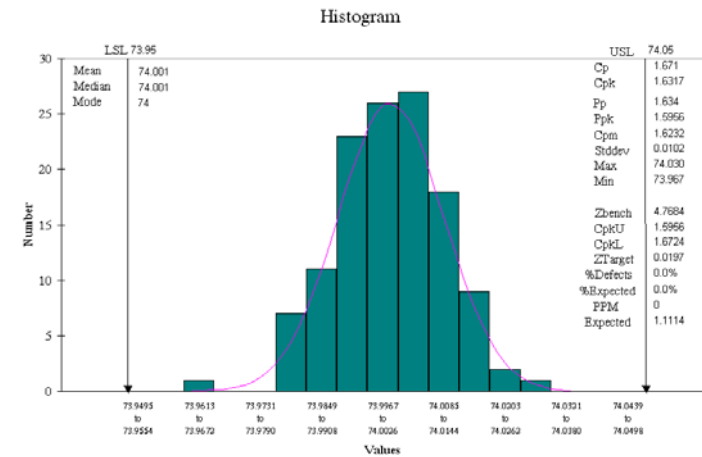
3. **From the QI Macro Menu bar, select either the histogram or frequency histogram.** You will be prompted for upper and lower spec limits and the approximate # of bars to display. Click OK to use the defaults or enter your own. For one-sided or unilateral histograms, click Cancel if there is no USL or LSL.



4. **Single Column of Data?** If you select a single column of data, the histogram will prompt for subgroup size (default=1, but some gauges produce five samples per subgroup).



5. **Then, the macro will draw the graph for you.**



6. **To move the USL or LSL arrows or text boxes:**

**Arrows:** Click on each arrow and drag it to the appropriate position. To extend an arrow, click on it, then click on the handle at either end and extend the arrow.

**Text:** Click on each text box and drag it to sit on top or beside its corresponding arrow.

7. **To revise the process capability analysis, switch to the Histdata sheet and change the upper and/or lower specification limits. Excel will recalculate Cp, Cpk and other metrics and update the contents of the text boxes on the chart. You can also change the # of bars, class width and beginning point.**

|                   |        |
|-------------------|--------|
| LSL               | 73.970 |
| USL               | 74.030 |
| Number of Bars    | 11.000 |
| Number of Classes | 6.000  |
| Class Width       | 0.010  |
| Beginning Point   | 73.960 |

For information about histogram calculations in the QI Macros, see [qimacros.com/pdf/histogram-manual-calcs.pdf](http://qimacros.com/pdf/histogram-manual-calcs.pdf).

Watch a video showing how to create a histogram at [qimacros.com/qiwizard/histogram-video.html](http://qimacros.com/qiwizard/histogram-video.html).



# Control Chart Wizard:

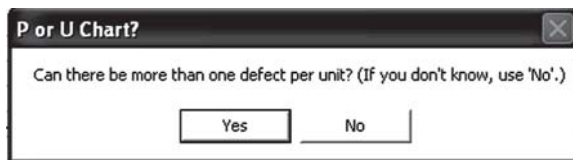
Choosing the right chart depends on your data—attribute (counted) or variable (measured)—and the sample size.

| Type of data                           | Number in Sample |                              |              |
|--|------------------|------------------------------|--------------|
|  | 1                | 2-or-more                    | Varies       |
| Fraction Defective                     |                  | <b>np</b>                    | <b>p</b>     |
| Number of defects                      |                  | <b>c</b>                     | <b>u</b>     |
| Time, length, weight, \$<br>(Measured) | <b>XmR</b>       | <b>XbarR</b><br><b>XbarS</b> | <b>XbarS</b> |

You can select the chart yourself or let the Control Chart Wizard analyze your data and select it for you.

To use the Control Chart Wizard:

1. Highlight the labels and data to be graphed. From the QI Macro Menu bar, select **Control Chart Wizard**.
2. The wizard will analyze your data and select the correct chart for you. If it needs to determine between a p and a u chart it will prompt you to answer the following question:



If you answer No, it will run a p chart. If you answer Yes, it will run a u chart.

Resources for selecting your own chart include:

- The SPC Quick Reference Card at [qimacros.com/sustainaid.pdf](http://qimacros.com/sustainaid.pdf)
- Free article at [qimacros.com/free-excel-tips/choosing-control-charts.html](http://qimacros.com/free-excel-tips/choosing-control-charts.html)
- The 1 hour SPC Simplified Training Video at [qimacros.com/spc-simplified-training-video.html](http://qimacros.com/spc-simplified-training-video.html)

# Create a c, np, p or u Chart:

Attribute charts track the number of defects in a sample.

1. Highlight the labels and data to be graphed (as shown).

c or np charts

|    | E            |
|----|--------------|
| 1  | No. Pinholes |
| 2  | 8            |
| 3  | 9            |
| 4  | 5            |
| 5  | 8            |
| 6  | 5            |
| 7  | 9            |
| 8  | 9            |
| 9  | 11           |
| 10 | 8            |

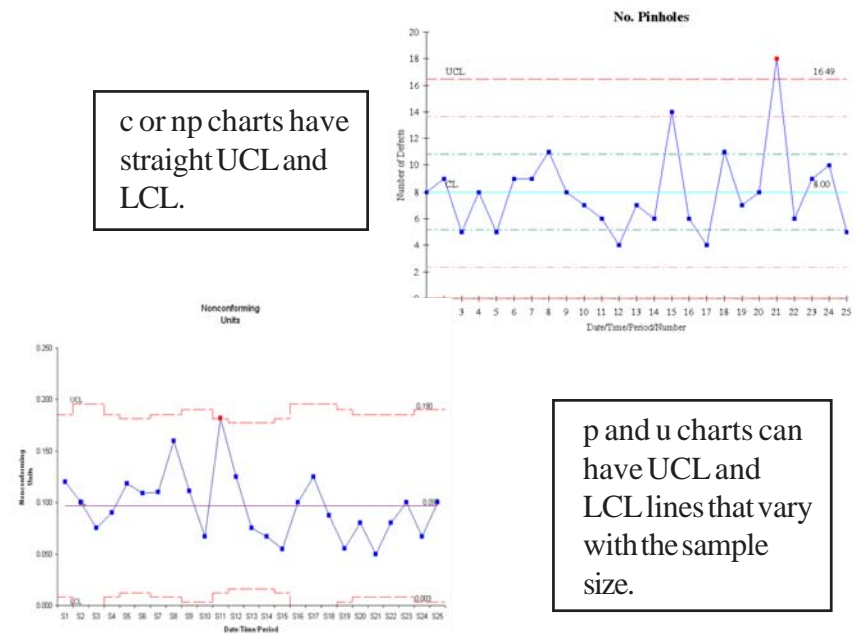
p charts

| A             | B                   | C           |
|---------------|---------------------|-------------|
| Sample Number | Nonconforming Units | Sample Size |
| S1            | 12                  | 100         |
| S2            | 8                   | 80          |
| S3            | 6                   | 80          |
| S4            | 9                   | 100         |
| S5            | 13                  | 110         |
| S6            | 12                  | 110         |
| S7            | 11                  | 100         |
| S8            | 16                  | 100         |
| S9            | 10                  | 90          |

u charts

| A             | B                   | C           |
|---------------|---------------------|-------------|
| Sample Number | Nonconforming Units | Sample Size |
| S1            | 12                  | 100         |
| S2            | 8                   | 80          |
| S3            | 6                   | 80          |
| S4            | 9                   | 100         |
| S5            | 13                  | 110         |
| S6            | 12                  | 110         |
| S7            | 11                  | 100         |
| S8            | 16                  | 100         |
| S9            | 10                  | 90          |

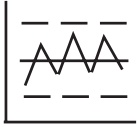
2. From the Control Charts Menu, select "c, np, p or u chart". The np chart will prompt for a sample size if you did not include it in your selection.



c or np charts have straight UCL and LCL.

p and u charts can have UCL and LCL lines that vary with the sample size.

See also: [qimacros.com/control-charts/show-hide-sigma-lines.html](http://qimacros.com/control-charts/show-hide-sigma-lines.html)  
[qimacros.com/control-charts/p-and-u-chart-formats.html](http://qimacros.com/control-charts/p-and-u-chart-formats.html)



# Create X and R Charts:

An X chart shows process performance using continuous data (i.e., time, length, weight, money, etc.)

1. **Highlight the labels and data to be graphed.** You will need 20 or more data points to get a good graph. Your data should look like this:

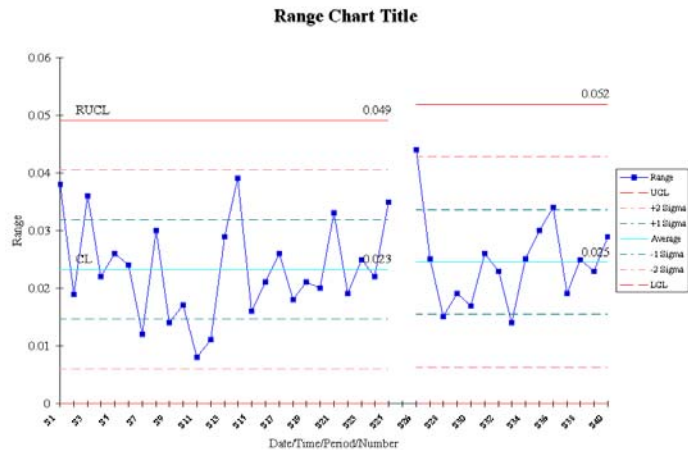
**XmR**

|   | A      | B         |
|---|--------|-----------|
|   | Batch  | Viscosity |
| 1 | Number | Viscosity |
| 2 | B1     | 33.75     |
| 3 | B2     | 33.05     |
| 4 | B3     | 34.00     |
| 5 | B4     | 33.81     |
| 6 | B5     | 33.46     |

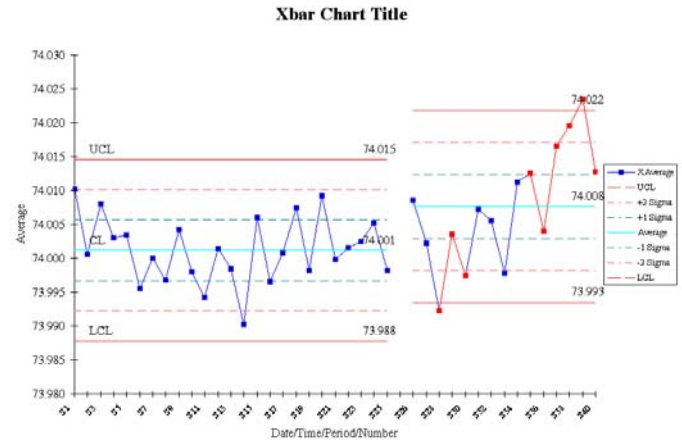
**XbarR and XbarS**

|   | A      | B      | C      | D      | E      | F      |
|---|--------|--------|--------|--------|--------|--------|
|   | Sample | Obs 1  | Obs 2  | Obs 3  | Obs 4  | Obs 5  |
| 1 | Number | Obs 1  | Obs 2  | Obs 3  | Obs 4  | Obs 5  |
| 2 | S1     | 74.030 | 74.002 | 74.019 | 73.992 | 74.008 |
| 3 | S2     | 73.995 | 73.992 | 74.001 | 74.011 | 74.004 |
| 4 | S3     | 73.988 | 74.024 | 74.021 | 74.005 | 74.002 |
| 5 | S4     | 74.002 | 73.996 | 73.993 | 74.015 | 74.009 |
| 6 | S5     | 73.992 | 74.007 | 74.015 | 73.989 | 74.014 |

2. From the QI Macro Menu bar, select "XmR, XmR Median R, XmR Trend, XbarR, XbarS, or Xmedian Chart." The macro will create a new worksheet and begin calculating the X and R values, control limits, and averages.
3. The macro will first draw the Range Chart. If the R chart looks unstable, then the process is unstable.



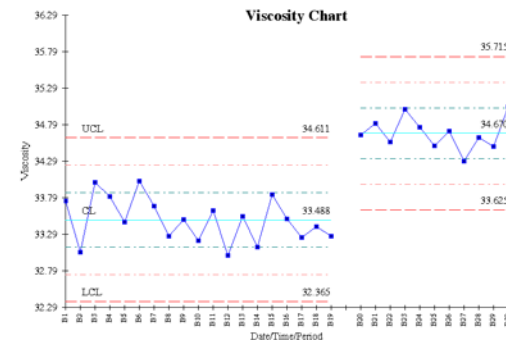
4. Next, the macro will draw the X chart. If the Range Chart looks stable and the X chart is stable, then the process is stable.



5. From the File Menu, select Save to save the graph with your workbook.

# Create Stair Step Limits:

Before you run any control chart you can insert a blank row in your data where you know a process change occurred, the QI Macros will calculate separate UCLs and LCLs for each group of data giving you "stair-step" control limits.



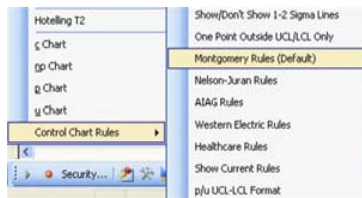
For more information about control chart menu features see [qimacros.com/qimacros-excel-tips.html#menu](http://qimacros.com/qimacros-excel-tips.html#menu)

# Control Chart Stability Rules

When you run a control chart, the QI Macros will show unstable points as diamonds and conditions in red. They will also show 1 and 2 sigma lines for evaluating stability. The QI Macros use stability rules defined in Montgomery's Introduction to Statistical Quality Control 4th edition.

You can change the sigma lines, stability rules or p/u chart limit formats (flat vs wavy) as follows:

1. Click on the QI Macros Menu, then Control Charts then Control Chart Rules.



2. Click on the stability rules you want to use. The stability rules for each selection are:

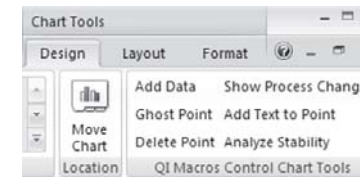
| Control Chart Rules                                    | Nelson-Juran | AIAG | Montgomery | Western Electric |
|--|--------------|------|------------|------------------|
| Points above UCL or Below LCL                          | 1            | 1    | 1          | 1                |
| Zone A $n$ of $n + 1$ points above/below 2 sigma       | 2            | 2    | 2          | 2                |
| Zone B $n$ of $n + 1$ points above/below 1 sigma       | 4            | 4    | 4          | 4                |
| $n$ points in a row above or below center line         | 9            | 7    | 8          | 8                |
| Trends of $n$ points in a row increasing or decreasing | 6            | 6    | 6          |                  |
| Zone C - $n$ points in a row inside Zone C (hugging)   | 15           | 15   | 15         |                  |
| $n$ points in a row alternating up and down            | 14           | 14   | 14         |                  |
| Zone C - $n$ points in a row outside Zone C            | 8            | 8    | 8          |                  |

3. To hide sigma lines or change p/u chart formats click on the appropriate selection.
4. Any changes you make will be saved to the QI Macros and will be applied to all of the charts you run. To change the rules back, simply click on Control Chart Rules and select Default rules or Show Hide 1 and 2 sigma lines or p/u chart format. If you want to customize the stability and chart format rules even further, see [qimacros.com/free-excel-tips/control-chart-rules.html](http://qimacros.com/free-excel-tips/control-chart-rules.html).

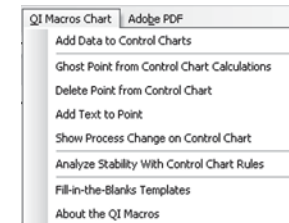
# Control Chart Tools Menu

After you run a control chart, the QI Macros give you additional tools to help update and analyze your data using the Chart Tools menu.

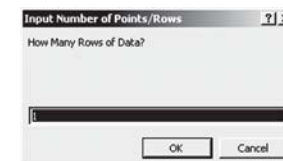
**Chart Tools menu in Excel 2007-2010:** After you run a chart, the Chart Tools menu below should be visible. If it is not, click on the chart then on Chart Tools (just above the QI Macros). Note you must be in a chart to view this menu.



**Control Chart Tools in earlier versions of Excel:** While in a chart, just click on QI Macros to view the chart tools menu.



**Add Data to Control Charts:** Click on the chart data worksheet (i.e. cdata) and add your new data points. Then go to the chart and click on the chart tools menu and Add Data to Control Charts. Enter the number of rows to add and click OK.



**Analyze Stability:** After you add new data, delete a point or show a process change you should rerun stability analysis. To do so, simply click on Analyze Stability on the chart tools menu.

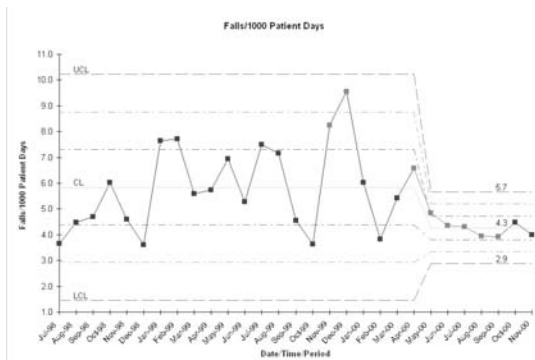
# Control Chart Tools Menu

**Delete Point:** Deletes a point from a control chart and the calculations.

**Ghost Point:** Deletes a point from the calculations but leaves it on the chart.

While these are not usually recommended, they can be done by clicking on an individual data point, then on the chart tools menu and then Delete or Ghost Point. Make sure you rerun stability analysis.

**Show Process Change :** On the chart click on the point where the process change occurred. Now click on the tools menu and select Show Process Change. The macros will calculate a new set of control limits starting at the point you selected. The UCL, CL and LCL values will be updated to show the new limits.



**Stability Analysis:** Rerun stability analysis with the new limits.

**Recalculate Control Limits After you Add New Data (optional):**

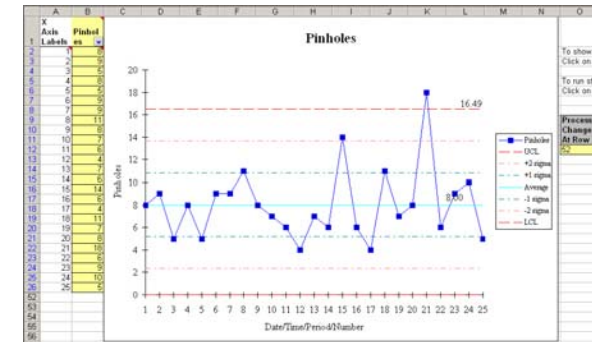
Control limits are calculated with the data you selected when running the macro. If you want to recalculate control limits after you add new data: Add new data to the chart per previous instructions. Next, click on the first data point on the chart and select Show Process change on the menu. Since this function recalculates control limits using the point selected and every point to the right, it will recalculate your control limits using all of your data including the new points. For more info about these features see [qimacros.com/qimacros-excel-tips.html](http://qimacros.com/qimacros-excel-tips.html)

# Control Chart Templates



You can also use Fill-in-the-Blanks templates to create control charts.

1. Click on the QI Macros Menu, Fill-In-The-Blanks Templates and then SPC Charts. Then select the desired template.



2. Each template is made up of several worksheets (average, median, rolling, fixed, short run etc.) See further info and descriptions at [qimacros.com/qiwizard/control-chart-template.html](http://qimacros.com/qiwizard/control-chart-template.html)

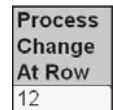
\XmR Individuals Chart / XmR Rolling / XmR MedianR / XmR Short Run / XmR Horizontal / XmR Fixed /

Just input your data in the yellow area and the points will be plotted on the chart as you enter them. You can also cut and paste into the yellow area or link the cells to another spreadsheet.

**Add New Data:** Templates default to 50 data points. To add more points, copy down the formulas (they are hidden behind the charts), then click on the chart and select Add Data to Control Charts on the chart tools menu. Input the number of points you want to add.

**Delete a Point:** simply delete the point from the input area.

**Show Process Change:** enter the Excel row number corresponding to the data point where the Process Change occurred in the process change box to the right of the chart.

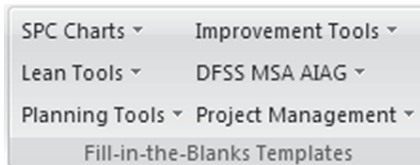


**Analyze Stability:** click on the chart and then select Analyze Stability on the chart tools menu.

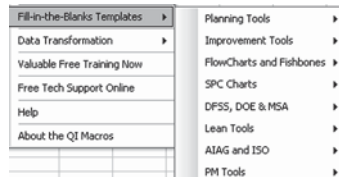
# Fill-in-the-Blank Templates:

The QIMacros contain 80+ templates including a balanced scorecard, flowcharts, fishbones, FMEA, QFD, DOE, GageR&R, PPAP, Value Stream Mapping, Time Tracking and more. There are also templates for most charts including control charts, histograms, scatter, box whisker and pareto charts.

**Fill-In-the-Blanks Templates in Excel 2007-2010:** Click on QI Macros, then look for Fill-in-the-Blanks Templates. Click on each sub menu to get a list of templates in that category.



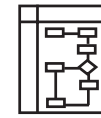
**Fill-In-the-Blanks Templates in other versions of Excel:** From the QI Macro Menu bar, choose Fill-In-The-Blank-Templates. Then choose a sub menu to get a list of templates in that category.



Many templates including the Balanced Scorecard, FMEA, Gage R&R, DOE and PPAP Forms are really several different templates (worksheets) in one workbook. To access each worksheet just click on the worksheet tab.

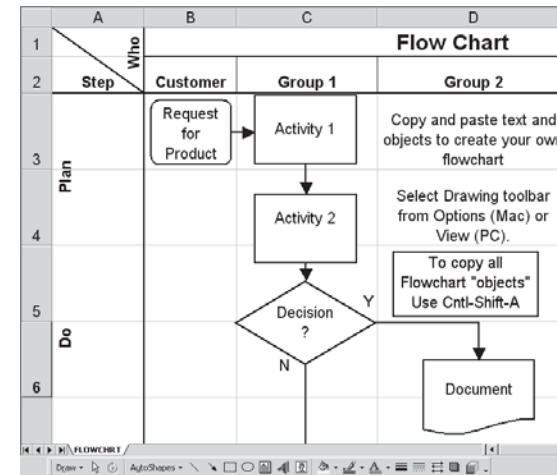


Our Six Sigma Ezine archives contain articles about many of these tools at [qimacros.com/six-sigma-articles.html](http://qimacros.com/six-sigma-articles.html).

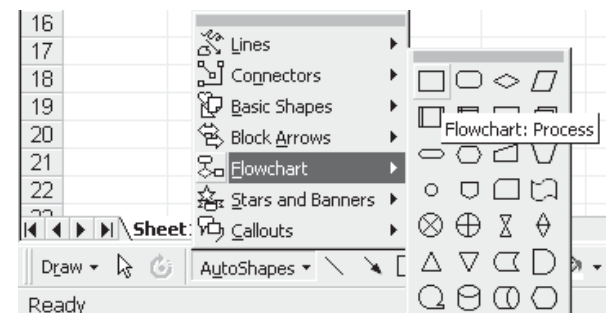


# Create a Flow Chart:

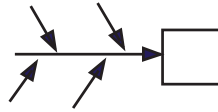
- The first step of managing any process is to define its flow.** Select Fill-in-the-Blanks Templates, Flowcharts and Fishbones, then **choose the Flow Chart template.**



- From the File Menu, **select Save As to store the template under a new name.**
- Copy and paste** the existing text, boxes, diamonds and arrows to create your flow chart. Change the text.
- Excel 2000 to 2003:** Select **VIEW-TOOLBARS- DRAWING**. In **Excel 2007-2010**, select **Insert, Shapes**. Use **Autoshapes** to find more drawing shapes and to connect the boxes and diamonds as you would with any flowcharting tool.

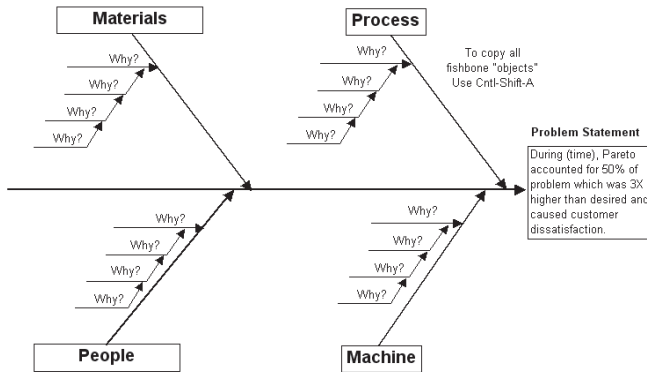


# Create an Ishikawa:

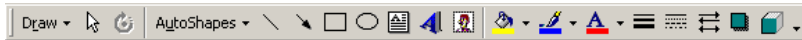


Excel may not be the best tool to do this with, but you can easily draw Ishikawa diagrams with the drawing tools.

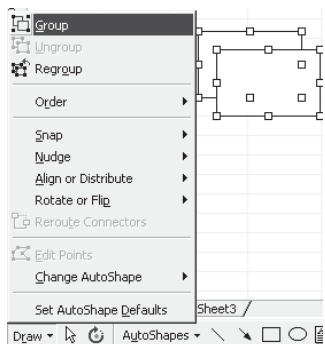
1. Select Fill-in-the-Blanks Templates, Flowcharts and Fishbones, then choose the Ishikawa, or fishbone diagram.



2. From the File Menu, select Save As to store the template under a new name.
3. Use the text and arrow tools from the Drawing Tool Bar to add arrows and causes. (To see the tool bar, select: **View/Options-Toolbars-Drawing.**) In Excel 2007-2010, select Insert-Shapes.



Use the Ellipse tool to circle root causes.



Each line, box, text or circle is called an "object." Objects can be grouped together to form a single object or moved in front or behind each other using the Drawing Tool. To copy the fishbone and place it in another document, use Ctr+Shift + A to select all objects, then Edit-Copy.

# Create a QFD Template:

1. From the QI Macros, select Fill-in-the-blanks Templates, then DFSS. Choose the QFD House of Quality.

| Direction of Improvement     |  |                  | ▼                 | ▲                 | ▼                 | ▲                 | ▼                 | Customer Rating |
|------------------------------|--|------------------|-------------------|-------------------|-------------------|-------------------|-------------------|-----------------|
| Design Requirements (How)    |  | Importance (1-5) | Design Criteria 1 | Design Criteria 2 | Design Criteria 3 | Design Criteria 4 | Design Criteria 5 | Company         |
| Customer Requirements (What) |  |                  |                   |                   |                   |                   |                   | Competitor 1    |
|                              |  |                  |                   |                   |                   |                   |                   | Competitor 2    |
|                              |  |                  |                   |                   |                   |                   |                   | Competitor 3    |
|                              |  |                  |                   |                   |                   |                   |                   | Competitor 4    |
| Improve                      |  | Speed            | 5                 | 1                 |                   |                   |                   | ○               |
|                              |  | Quality          | 5                 | 9                 | 3                 |                   | 1                 | □               |
|                              |  | Value            | 4                 |                   | 1                 |                   |                   | △               |
| Reduce                       |  | Cycle time       | 4                 |                   | 9                 |                   | 1                 | ●               |
|                              |  | Defects          | 4                 |                   | 1                 | 3                 |                   | ■               |
|                              |  | Cost             | 3                 |                   |                   |                   |                   | ○               |
| Targets                      |  |                  | 50%               | 20%               | 1hr               | 10%               | 50%               |                 |
| Technical Evaluation         |  | Company          | ○                 |                   |                   |                   |                   | 5               |
|                              |  | Competitor 1     | □                 |                   |                   |                   |                   | 4               |
|                              |  | Competitor 2     | △                 |                   |                   |                   |                   | 3               |
|                              |  | Competitor 3     | ●                 |                   |                   |                   |                   | 2               |
|                              |  | Competitor 4     | ■                 |                   |                   |                   |                   | 1               |
| Absolute Importance          |  |                  | 50                | 23                | 48                | 5                 | 16                |                 |

2. From the File Menu, select Save As to store the template under a new name.
3. Enter the "whats" and "hows" for the diagram. Insert columns and rows as required to expand the matrix. Then enter importance and interactions.
4. Excel 2000-2003: Select VIEW-TOOLBARS- DRAWING. Use Autosshapes to draw all competitor scores.

For articles about QFD, go to [www.qimacros.com/six-sigma-articles.html](http://www.qimacros.com/six-sigma-articles.html)

To sign up for our Six Sigma ezine, send an email to six-sigma-ezine@aweber.com, Subject = "sign up"

# Create a GageR&R:

- From the QI Macros, select **Fill-in-the-blanks Templates**, then **DFSS, DOE, MSA**. Choose the GageR&R template.

|    | A                                 | B       | C       | D      | E      | F      | G      | H      | I      | J      | K      | L      | M      | N         | O         |        |
|----|-----------------------------------|---------|---------|--------|--------|--------|--------|--------|--------|--------|--------|--------|--------|-----------|-----------|--------|
| 1  | <b>Gage R&amp;R</b>               |         |         |        |        |        |        |        |        |        |        |        |        |           |           |        |
| 2  | <b>Average &amp; Range Method</b> |         |         |        |        |        |        |        |        |        |        |        |        |           |           |        |
| 3  | Appraiser 1                       | Trial 1 | 0.29    | -0.56  | 1.34   | 0.47   | -0.8   | 0.02   | 0.59   | -0.31  | 2.26   | -1.36  | 5.710  |           |           |        |
| 4  | Enter your data here->            | Trial2  | 0.41    | -0.68  | 1.17   | 0.5    | -0.92  | -0.11  | 0.75   | -0.2   | 1.99   | -1.25  |        |           |           |        |
| 5  |                                   | Trial3  | 0.64    | -0.58  | 1.27   | 0.64   | -0.84  | -0.21  | 0.66   | -0.17  | 2.01   | -1.31  | 2.110  |           |           |        |
| 6  |                                   | Trial4  |         |        |        |        |        |        |        |        |        |        |        | Xbar1     | Reference |        |
| 7  |                                   | Trial5  |         |        |        |        |        |        |        |        |        |        |        | 0.190333  | 0.001     |        |
| 8  |                                   | Total   | 1.34    | -1.82  | 3.78   | 1.61   | -2.56  | -0.3   | 2      | -0.68  | 6.26   | -3.92  |        |           | Bias      | 0.189  |
| 9  |                                   | Average | 0.44667 | -0.607 | 1.26   | 0.5367 | -0.853 | -0.1   | 0.6667 | -0.227 | 2.0867 | -1.307 |        | Rbar1     |           |        |
| 10 |                                   | Range1  | 0.35    | 0.12   | 0.17   | 0.17   | 0.12   | 0.23   | 0.16   | 0.14   | 0.27   | 0.11   |        |           | 0.184     |        |
| 11 | Appraiser 2                       | Trial 1 | 0.08    | -0.47  | 1.19   | 0.01   | -0.56  | -0.2   | 0.47   | -0.63  | 1.8    | -1.88  | 2.050  |           |           |        |
| 12 | Enter your data here->            | Trial2  | 0.25    | -1.22  | 0.94   | 1.03   | -1.2   | 0.22   | 0.55   | 0.08   | 2.12   | -1.62  |        |           |           |        |
| 13 |                                   | Trial3  | 0.07    | -0.68  | 1.34   | 0.2    | -1.28  | 0.06   | 0.83   | -0.34  | 2.19   | -1.5   | 0.890  |           |           |        |
| 14 |                                   | Trial4  |         |        |        |        |        |        |        |        |        |        |        | Xbar2     | Reference |        |
| 15 |                                   | Trial5  |         |        |        |        |        |        |        |        |        |        |        | 0.068333  | 0.001     |        |
| 16 |                                   | Total   | 0.4     | -2.37  | 3.47   | 1.24   | -3.04  | 0.08   | 1.85   | -0.89  | 6.11   | -4.8   |        |           | Bias      | 0.067  |
| 17 |                                   | Average | 0.13333 | -0.79  | 1.1567 | 0.4133 | -1.013 | 0.0267 | 0.6167 | -0.297 | 2.0367 | -1.6   |        | Rbar2     |           |        |
| 18 |                                   | Range2  | 0.18    | 0.75   | 0.4    | 1.02   | 0.72   | 0.42   | 0.36   | 0.71   | 0.39   | 0.18   |        |           | 0.513     |        |
| 19 | Appraiser                         | Trial 1 | 0.04    | -1.38  | 0.88   | 0.14   | -1.46  | -0.29  | 0.02   | -0.46  | 1.77   | -1.49  | -7.630 |           |           |        |
| 20 | Enter your data here->            | Trial2  | -0.11   | -1.13  | 1.09   | 0.2    | -1.07  | -0.67  | 0.01   | -0.56  | 1.45   | -1.77  |        |           |           |        |
| 21 |                                   | Trial3  | -0.15   | -0.96  | 0.67   | 0.11   | -1.45  | -0.49  | 0.21   | -0.49  | 1.87   | -2.16  | -2.840 |           |           |        |
| 22 |                                   | Trial4  |         |        |        |        |        |        |        |        |        |        |        | Xbar3     | Reference |        |
| 23 |                                   | Trial5  |         |        |        |        |        |        |        |        |        |        |        | -0.254333 | 0.001     |        |
| 24 |                                   | Total   | -0.22   | -3.47  | 2.64   | 0.45   | -3.98  | -1.45  | 0.24   | -1.51  | 5.09   | -5.42  |        |           | Bias      | -0.256 |
| 25 |                                   | Average | -0.0733 | -1.157 | 0.88   | 0.15   | -1.327 | -0.483 | 0.08   | -0.503 | 1.6967 | -1.807 |        | Rbar3     |           |        |
| 26 |                                   | Range3  | 0.19    | 0.42   | 0.42   | 0.09   | 0.39   | 0.38   | 0.2    | 0.1    | 0.42   | 0.67   |        |           | 0.328     |        |

- From the File Menu, select **Save As** to store the template.
- To conduct a study you'll need:** five to ten of the same part from one batch or lot (these must span the range or tolerance you are trying to measure), at least two appraisers and a minimum of two measurement trials, on each part, by each appraiser. If you have references or specification tolerances, enter them.
- Evaluate GageR&R, graphs, and data** to identify where to improve your measurement system.

## Gage R&R System Acceptability

- % R&R < 10% - Gage System is Okay (Most variation caused by parts, not people or equipment)
- % R&R < 30% - May be acceptable based on importance of application and cost of gage or repair
- % R&R > 30% - Gage system needs improvement (People and equipment cause over 1/3 of variation)

See free articles at [qimacros.com/qimacros-excel-tips.html#msa](http://qimacros.com/qimacros-excel-tips.html#msa) or consider our Gage R&R whitepaper at [qimacros.com/products.php](http://qimacros.com/products.php)

# Design of Experiments (DOE):

DOE can help you shorten the time and effort required to discover the optimal conditions to produce Six Sigma quality in your product or service.

- On the **Fill-In-The-Blank Templates** menu select **DFSS**, then **DOE**. Next select the Taguchi or Plackett Burman template you want to use.
- Input your factors and the low-high settings for each factor. In a two factor test it might be: Time: 30 minutes & 45 minutes and Temperature: 325 degrees and 375 degrees.

| Design of Experiments |             |                            |                |     |
|-----------------------|-------------|----------------------------|----------------|-----|
| Factor                | Factor Name | Level 1 (Low)              | Level 2 (High) |     |
| 2 <sup>2</sup>        | A           | Time Enter                 | 30             | 45  |
|                       | B           | Tempera Factors            | 325            | 375 |
|                       | AB          | Time X Temperature         |                |     |
| 2 <sup>3</sup>        | C           | Here                       |                |     |
|                       | AC          | Time X c                   |                |     |
|                       | BC          | Temperature X c            |                |     |
|                       | ABC         | Time X Temperature X c     |                |     |
| 2 <sup>4</sup>        | D           |                            |                |     |
|                       | AD          | Time X d                   |                |     |
|                       | BD          | Temperature X d            |                |     |
|                       | CD          | c X d                      |                |     |
|                       | ABD         | Time X Temperature X d     |                |     |
|                       | ACD         | Time X c X d               |                |     |
|                       | BCD         | Temperature X c X d        |                |     |
|                       | ABCD        | Time X Temperature X c X d |                |     |

- Use the +/- values in the orthogonal array to guide your test of every combination. In a two factor test it would be: High ++ (45 min & 375 degrees), Low -- (30 min & 325 degrees), In between +- (45 min & 325 degrees) and -+ (30 min & 375 degrees).

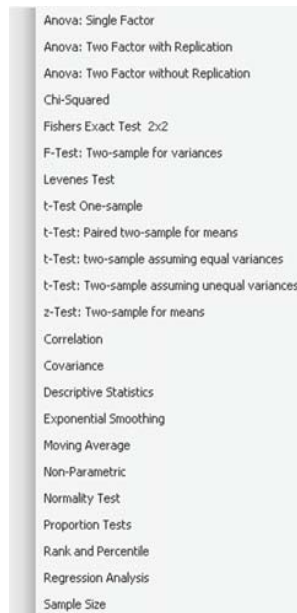
| Design Factors |   |   |   |    |   |    |    |     |
|----------------|---|---|---|----|---|----|----|-----|
| Trial          |   | A | B | AB | C | AC | BC | ABC |
| 2 <sup>2</sup> | 1 | - | - | +  | - | +  | +  | -   |
|                | 2 | + | - | -  | - | -  | +  | +   |
|                | 3 | - | + | -  | - | +  | -  | +   |
|                | 4 | + | + | +  | - | -  | -  | -   |
| 2 <sup>3</sup> | 5 | - | - | +  | + | -  | -  | +   |
|                | 6 | + | - | -  | + | +  | -  | -   |
|                | 7 | - | + | -  | + | -  | +  | -   |
|                | 8 | + | + | +  | + | +  | +  | +   |

- Input your results into the yellow input area and observe the interactions. See the DOE article at [qimacros.com/free-lean-six-sigma-tips/design-of-experiments.html](http://qimacros.com/free-lean-six-sigma-tips/design-of-experiments.html)

# Statistical Analysis

Six Sigma utilizes analysis tools like ANOVA, regression, and other tests. You can now access these tools through the QI Macros.

- Select data for analysis.** Some tools, like Anova can take many columns. Others, like regression use two columns. A few only use one column. Data must be in columns for these tools to work. See [c:qimacros/testdata/anova](http://c:qimacros/testdata/anova) for examples.
- From the QI Macros, choose Stat Wizard to automatically analyze normality, variation and means.** The Wizard will base it's analysis on the data selected.
- Or from the QI Macros, choose ANOVA and Analysis Tools.** A number of different statistical tools will be displayed.
- Select the appropriate statistical analysis, and click OK.** Answer any of the prompts (defaults are provided) and Excel will perform the analysis you've requested.



For more help go to:

[qimacros.com/qiwizard/statistics-wizard-excel.html](http://qimacros.com/qiwizard/statistics-wizard-excel.html)

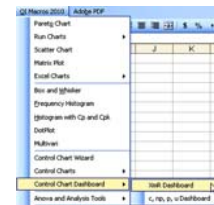
[qimacros.com/qiwizard/hypothesis-testing-excel.html](http://qimacros.com/qiwizard/hypothesis-testing-excel.html)

# Control Chart Dashboards

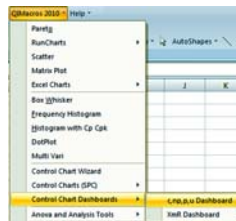
These new templates will automatically create control chart dashboards for you.

- Click on the QI Macros menu (see below examples) and select Control Chart dashboards. Then select the XmR or c, np, p, u dashboard.

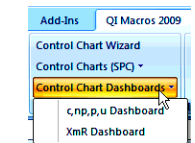
Excel 2000 to 2003



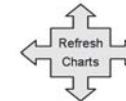
Excel 2007 Classic



Excel 2007-2010



- A template will open. Each template has an instructions sheet, a data input sheet, and a sheet for each available chart.
- Input or cut and paste your data into the columns of the Data Sheet. Each column or set of columns creates a different chart. The XmR dashboard has cells for USL/LSL as well.
- Now click on the sheet for the desired chart. You will see a chart created from the first data set. Click on the previous and next arrows to view charts for each data set.
- If you want to create a dashboard with charts for all data sets, simply click on the Create Dashboards icon.
- To add new data to the templates or the dashboard charts just add data to the Data Sheet and click on the Refresh Data icon.



- To analyze stability on any of the charts, click on the chart and then select Analyze Stability from the QI Macros chart menu.

See also [qimacros.com/qiwizard/control-chart-dashboard.html](http://qimacros.com/qiwizard/control-chart-dashboard.html)

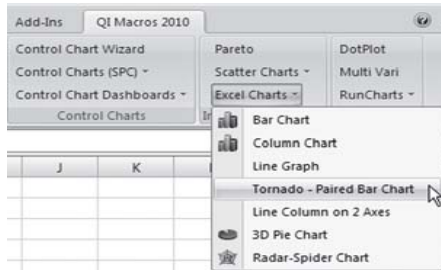




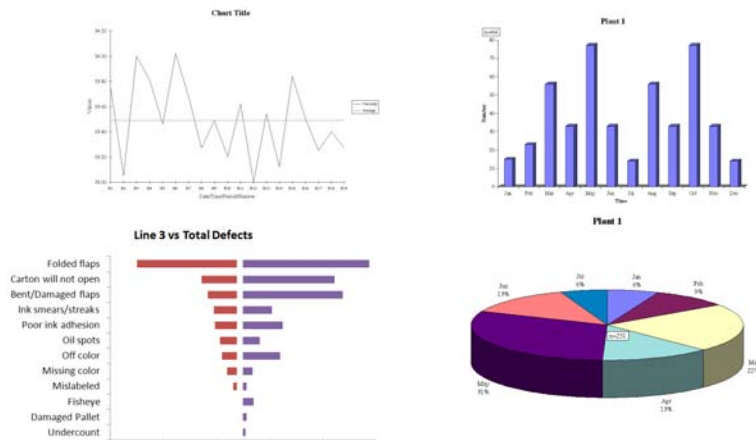
# Create Excel Charts:

Excel's chart wizard enables you to run various charts. We have taken the most popular of these and made them easier to use. To run a **line, bar, pie, spider (radar) or line column chart**:

1. Highlight the labels and data to be graphed, then click on the QI Macros pull down menu, Excel Charts and then select the chart you want to run.



2. The QIMacros will prompt you for the graph title, and the X and Y Axis titles as appropriate.



# Create Run Charts

A run chart is a line graph of your data and an additional line representing the average or median of your data. **Create a run chart by selecting your data and selecting run chart from the QI Macros pull down menu, then select Average or Median.**

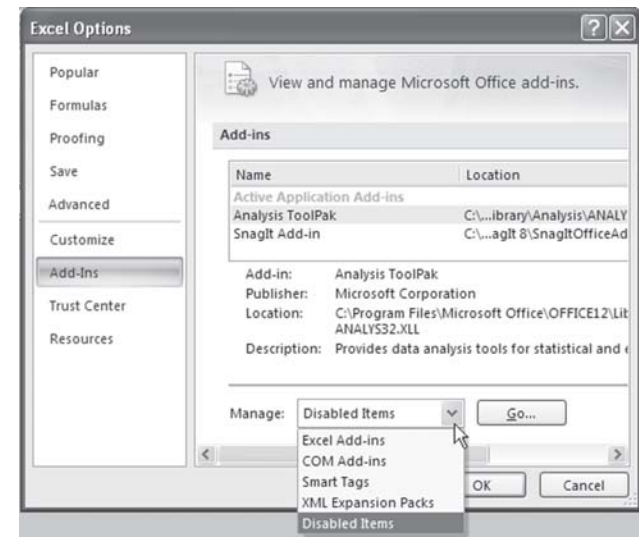
# Installation Trouble Shooting

**QI Macros Menu is not visible in Excel OR qimacro.xla could not be found message .** Excel has disabled the QI Macros files. To fix the issue simply re-enable the file per these instructions:

**Excel 2000 - 2003:** In Excel click on Help/About Microsoft Excel then click on Disabled items in the lower right corner. Enable any disabled QI Macros files.



**Excel 2007-10:** In Excel click on the office icon in the upper left corner, then Excel Options then Add ins on the left. Click on the arrow next to Manage and select Disabled Items. Click Go to see disabled items. If th QIMacros are disabled, enable them.



## Other Common Questions

- **How do I set up my data?** See test data files loaded on your computer at c:\qimacros\testdata.
- **Run Time Error...** These messages mean there is a problem with your data. Either your header looks like data, your data looks like text or you have selected blank cells.
- **To uninstall the Macros:** Delete the following in Excel's startup folder at c:\Programfiles\Microsoft Office\Office(10, 11, 12,14)\XLStart: QI Templates folder, qimacros.xla file and the QIMacros2007menu.xlam file (Excel 2007-2010 only.)

## Technical Support

Most tech support questions are answered at: [qimacros.com/techsupport.html](http://qimacros.com/techsupport.html).

**If you're still having problems email your Excel file and problem to: [support@qimacros.com](mailto:support@qimacros.com).** Include the version number and service pack of Excel, and QI Macros version.

**You can also call our tech support line** at 888 468 1537. Help is available Monday thru Friday 8:00 am to 5:00 pm Mountain time.

**QI Macros questions are free, however, there is an additional fee for SPC and Excel coaching and help.**

**If you get Windows or Excel errors,** check the Microsoft knowledge base at [support.microsoft.com](http://support.microsoft.com)

## Other Resources

**QI Macros Help File** - click on the QI Macros pull down menu and then Help to access the QI Macros Help File.

**Email [qimacros@aweber.com](mailto:qimacros@aweber.com)** for a FREE supplemental course on the QI Macros.

**Disclaimer:** These macros are not infallible. Given bad data, they will halt. Simply press **Halt** or **Continue**.

## Customizing & Enhancements

The QI Macros are written in VBA. We can create custom Excel applications for you. Just let us know what you need and we will send you a free quote.

## Simple Turnkey Systems in Excel

Is there something you want to do in Excel, but you just don't have time to figure it out? Is there something the macros could do to help you make analysis more easy?

**Here are just a few of the applications we've developed for other clients in Microsoft Excel:**

- Healthcare Dashboards and Scorecards
- Do-it-yourself Dashboards and Scorecards
- Customer Wait Time Tracking
- Measurement Dashboards
- Automated roll-up of various data and charts

**For a free quote,** send your Excel data and charts to [lifestar@qimacros.com](mailto:lifestar@qimacros.com). Describe what you want to accomplish and we will send you a free estimate.

**Fill in the Blanks Dashboards Systems.** These systems contain a place to define your measures and color coding criteria, a data entry sheet, a color coded scorecard and a dashboard with control charts. See our 10, 20 and 30 measure dashboard systems at [www.qimacros.com/dashboard-scorecard-for-excel.html](http://www.qimacros.com/dashboard-scorecard-for-excel.html).

**Lean Six Sigma or QI Macros On-site Workshops** Consider bringing Jay on-site to train your employees and coworkers. Call (888) 468-1537 to schedule a class or view these pages for further information:

QI Macros One Day Workshop - [qimacros.com/qimacros-training.html](http://qimacros.com/qimacros-training.html)

Lean Six Sigma One Day Workshop - [qimacros.com/lean-six-sigma-workshop.html](http://qimacros.com/lean-six-sigma-workshop.html)

# Free Webinars and Training

**Free Monthly One Hour Webinars:** Great overview of the key functions in the QIMacros. Check dates and register at: [qimacros.com/webinars/webinar-dates.html](http://qimacros.com/webinars/webinar-dates.html)

**Free Lean Six Sigma "Money Belt" Training:** [www.lssmb.com](http://www.lssmb.com)

**Free email lesson series and monthly tips and tricks newsletter.** Sign up by sending an email to [qimacros@aweber.com](mailto:qimacros@aweber.com)

**Free articles and tips and tricks archive** at [qimacros.com/qimacros-excel-tips.html](http://qimacros.com/qimacros-excel-tips.html)

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## Other Products and Services

We offer books, training videos and on-site training on:

**Lean**

**Six Sigma**

**SPC**

Check out our products page at [qimacros.com/products.php](http://qimacros.com/products.php)

Download a product brochure at [qimacros.com/qiflyer.pdf](http://qimacros.com/qiflyer.pdf)

See on-site training options at [qimacros.com/lean-six-sigma-training.html](http://qimacros.com/lean-six-sigma-training.html)

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**Email:** [orders@qimacros.com](mailto:orders@qimacros.com)

**Tech Support:** (888) 468-1537 or (303) 756-9144 or [support@qimacros.com](mailto:support@qimacros.com)

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