



QIMacros[®]

EXAMPLE BOOK

QI Macros Example Book

© 2024 by Jay Arthur



Developers of QI Macros®

2696 S. Colorado Blvd., Suite 555

Denver, CO 80222

(888) 468-1537 or (303) 756-9144 (phone)

(888) 468-1536 or (303) 753-3107 (fax)

info@qimacros.com

www.qimacros.com

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Also by Jay Arthur:

Breakthrough Improvement with QI Macros and Excel, McGraw Hill, ©2014

Lean Six Sigma Demystified, 2nd Edition, A Self Teaching Guide, McGraw Hill, ©2011

Lean Six Sigma for Hospitals, 2nd Edition, McGraw Hill, ©2016

Agile Process Innovation, Hacking Lean Six Sigma for Maximum Results, Lifestar Publishing, ©2019

Free Resources:

- Download a fully functioning QI Macros 30-day trial: qimacros.com/trial
- QI Macros training resources: qimacros.com/free-resources
- QI Macros webinars: qimacros.com/lean-six-sigma-blog/upcoming-webinar
- Lean Six Sigma Yellow Belt training: qimacros.com/Moneybelt

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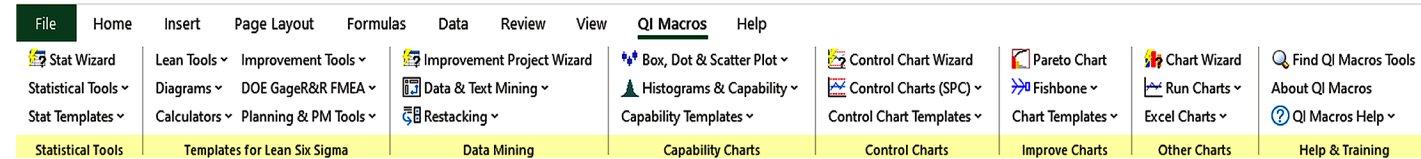
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QI Macros Overview

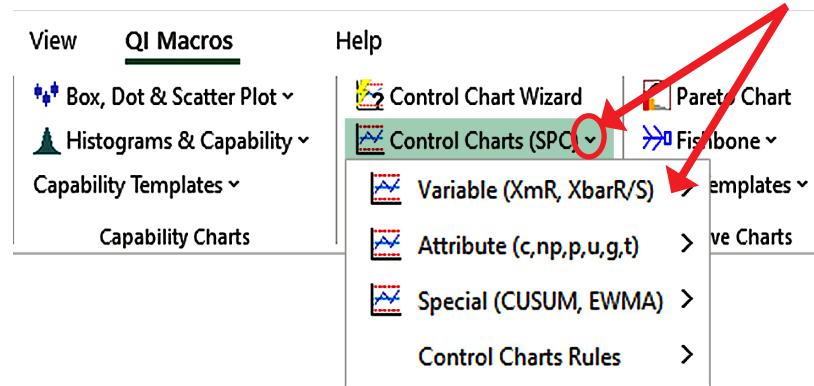
The QI Macros Menu

After installation, the QI Macros menu appears as an additional Excel menu tab. QI Macros tools are divided into several sections:



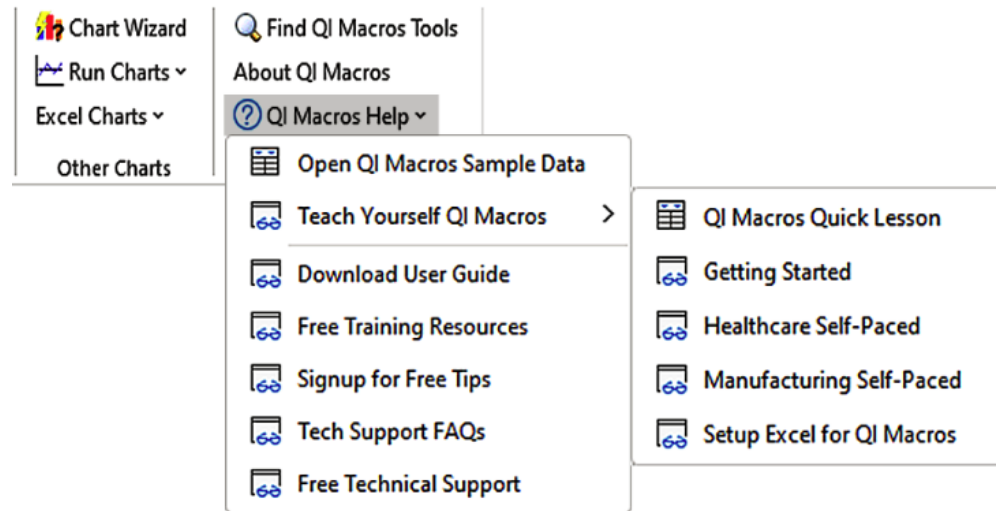
Submenus

An arrow to the right of a menu item indicates a sub-menu of additional tools.



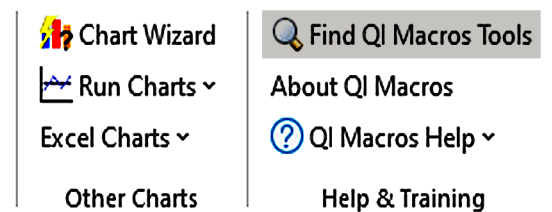
Help Menu

Access QI Macros Help from the Help & Training section on the menu to take a quick lesson, register your license, sign up for monthly newsletters, open sample data sets, and view free online training resources.



Find QI Macros Tools

Use the Find QI Macros Tools option in the Help & Training section of the QI Macros menu to search a tool name or keyword. qimacros.com/training/qi-macros-find-tools



Free Online Training Resources

Further explanations of the QI Macros tools described in this book are available as free online videos, articles, and webinars: qimacros.com/free-resources/qimacros-training

Creating Charts With QI Macros

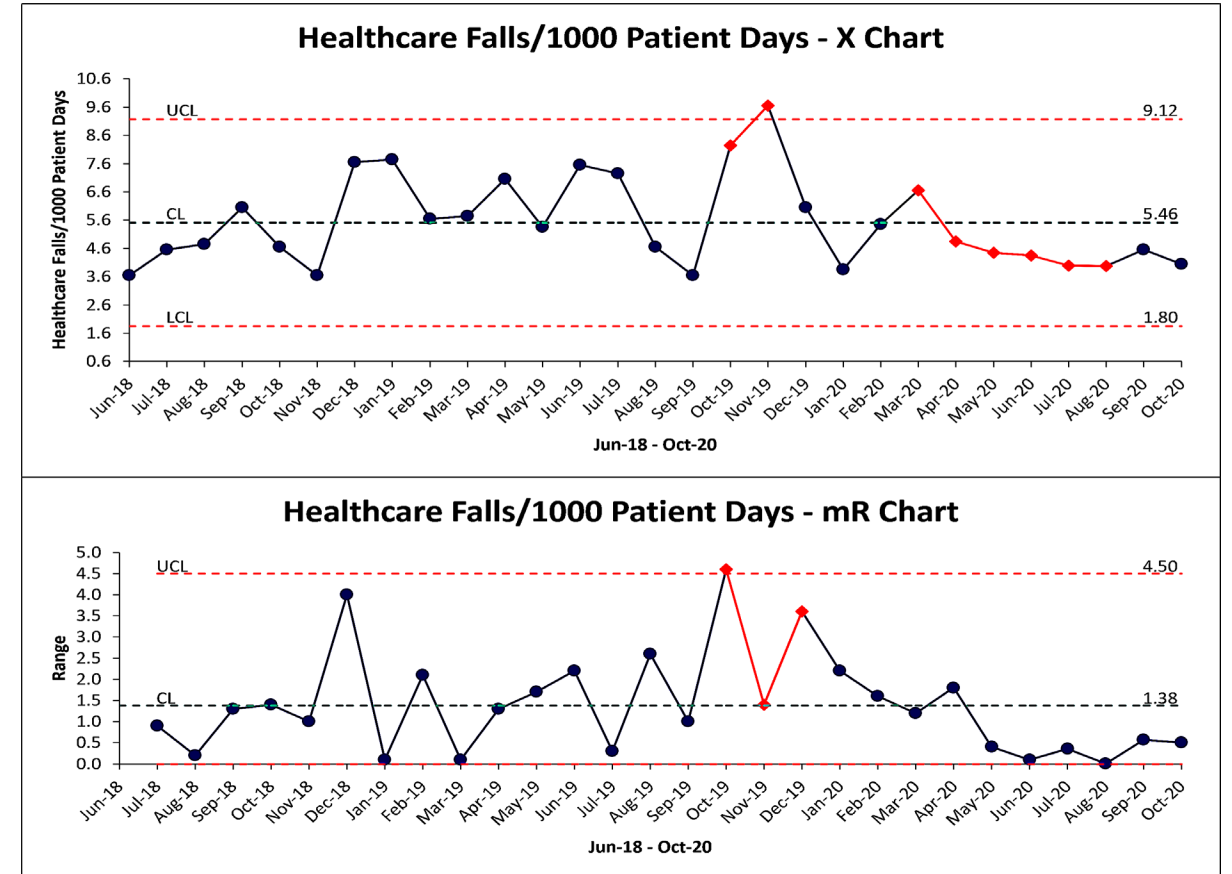
Quick Charts for Existing Excel Data

1. Highlight your Excel data. (Refer to the Data Formatting Tips section of this book for more information about setting up your Excel data.)

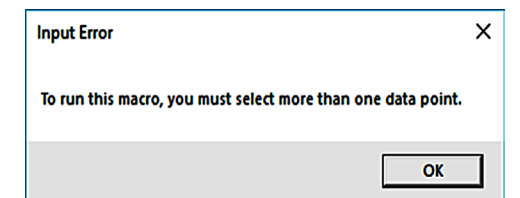
	A	B
	Month	Falls/1000 Patient Days
1		
2	Jun-18	3.6
3	Jul-18	4.5
4	Aug-18	4.7
5	Sep-18	6.0

2. Select a chart from the QI Macros menu. If you are unsure about which control chart to run, select Control Chart Wizard.

3. QI Macros performs the calculations and draws the chart.



Note: QI Macros chart macros require you to highlight Excel data prior to selecting them. If no data is selected, you will receive an error message.



qimacros.com/training/videos/control-chart-video

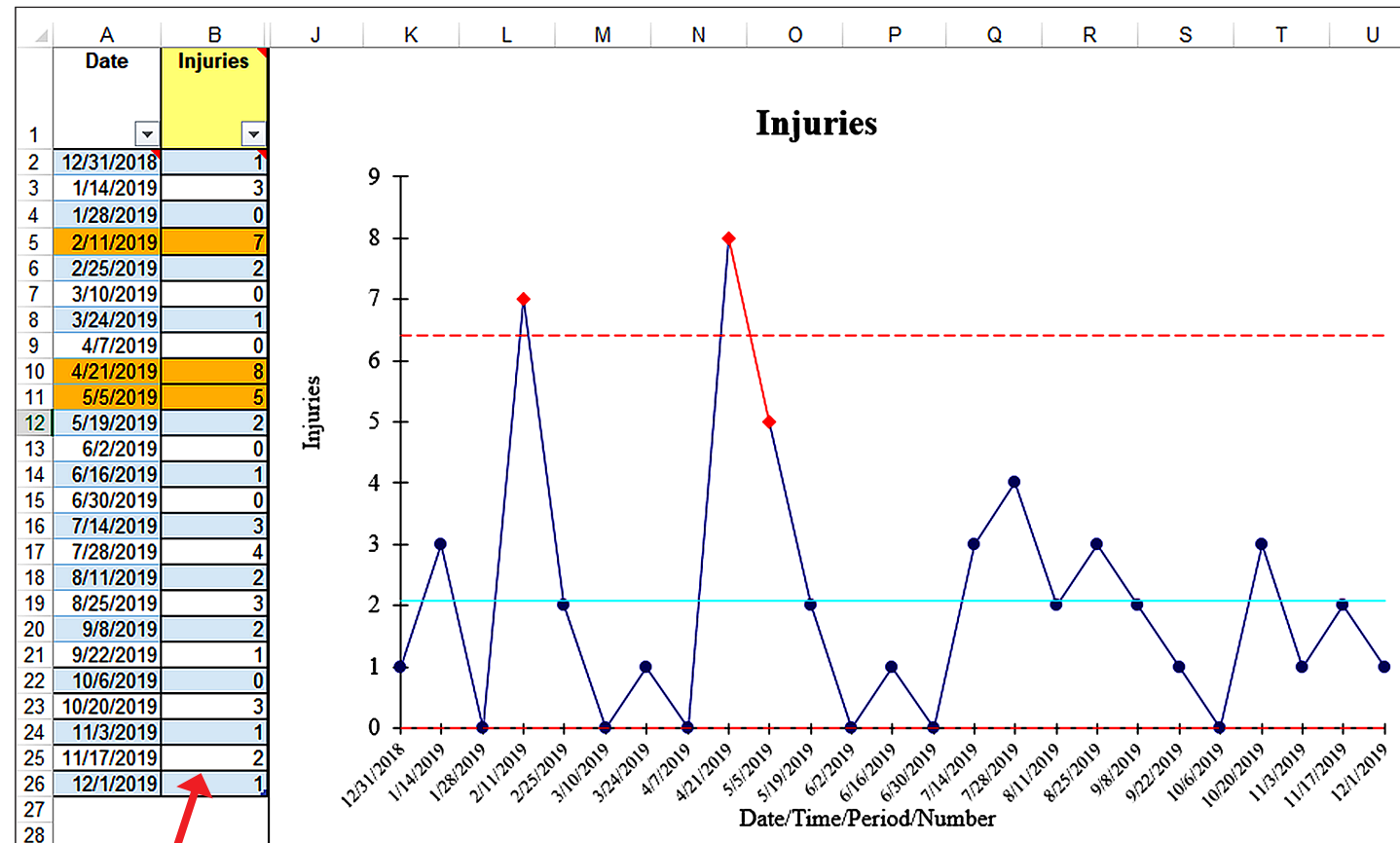
Chart Templates for Ongoing Data Collection

The QI Macros menu includes Stat Templates, Templates for Lean Six Sigma, Capability Templates, Control Chart Templates, a Fishbone template, and other Chart Templates.



The templates contain an input area for your data, and charts within these templates populate in real time, as you enter your data.

1. Select a template from the QI Macros menu.
2. Type or paste your data into the yellow input area.
3. Template charts populate automatically.



Data input area

qimacros.com/training/videos/chart-templates

Data Formatting Tips

Make sure to follow these guidelines when formatting your data.

Format Labels as Text

If your labels are numbers, Excel treats them as part of your data. Labels in numeric format will not chart correctly.

Correct Label Formats (text):

	A		A		A
1	Label	1	Label	1	Label
2	Lot1	2	S1	2	Sample1
3	Lot2	3	S2	3	Sample2
4	Lot3	4	S3	4	Sample3

Incorrect Label Format (numeric):

	A	B
1	Label	
2	1	74
3	2	70
4	3	71
5	4	65

To reformat numeric labels as text, type an apostrophe in front of each numeric label. Note: The format function in Excel will not reformat your labels as text.

	A
1	Label
2	'1

Format Data as Numbers

Your data must be numeric and formatted as a number to perform the necessary calculations. If you have data that is left justified or looks like 001, 002, 003 then it is formatted as text and the calculations may not run.

	A
1	Data
2	001
3	002
4	003

Select the Right Number of Columns

Each chart requires a certain number of data columns to run properly:

Number of Columns	Type of Chart
1 column	Pareto, pie, run, c chart, np chart, XmR chart
1 or more columns	line, bar, histogram
2 columns	scatter, u chart, p chart
2 or more columns	box & whisker, multi vari, XbarR chart, XbarS chart

Beware of Hidden Rows or Columns

If your data selection includes any hidden rows and columns, QI Macros will include that hidden data. Hold the control key (Ctrl) to select data in non-adjacent rows or columns.

Organize Data in Columns

QI Macros works best if data samples are organized in vertical columns, not horizontal rows.

Decimal Places

Format your data as numeric (1-6 decimal places) versus general (which has no precision).

Sample Data

For examples of how to set up your data, or to practice running charts, select Open QI Macros Sample Data from the QI Macros help menu.

qimacros.com/quality-tools/data-format-tips

QI Macros Wizards and Data Mining Tools

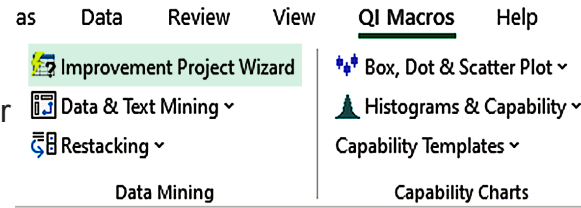
Improvement Project Wizard

The Improvement Project Wizard can quickly find the improvement project in large amounts of data. It examines your data, summarizes it into a pivot table, and creates control charts, Pareto charts, and a fishbone diagram.

1. Make sure each column in your data sheet has a heading and that no blank rows or columns separate the data you want in the pivot table.
2. Highlight two column headings, preferably a date and currency, number or text.
3. Select Improvement Project Wizard from the QI Macros menu.

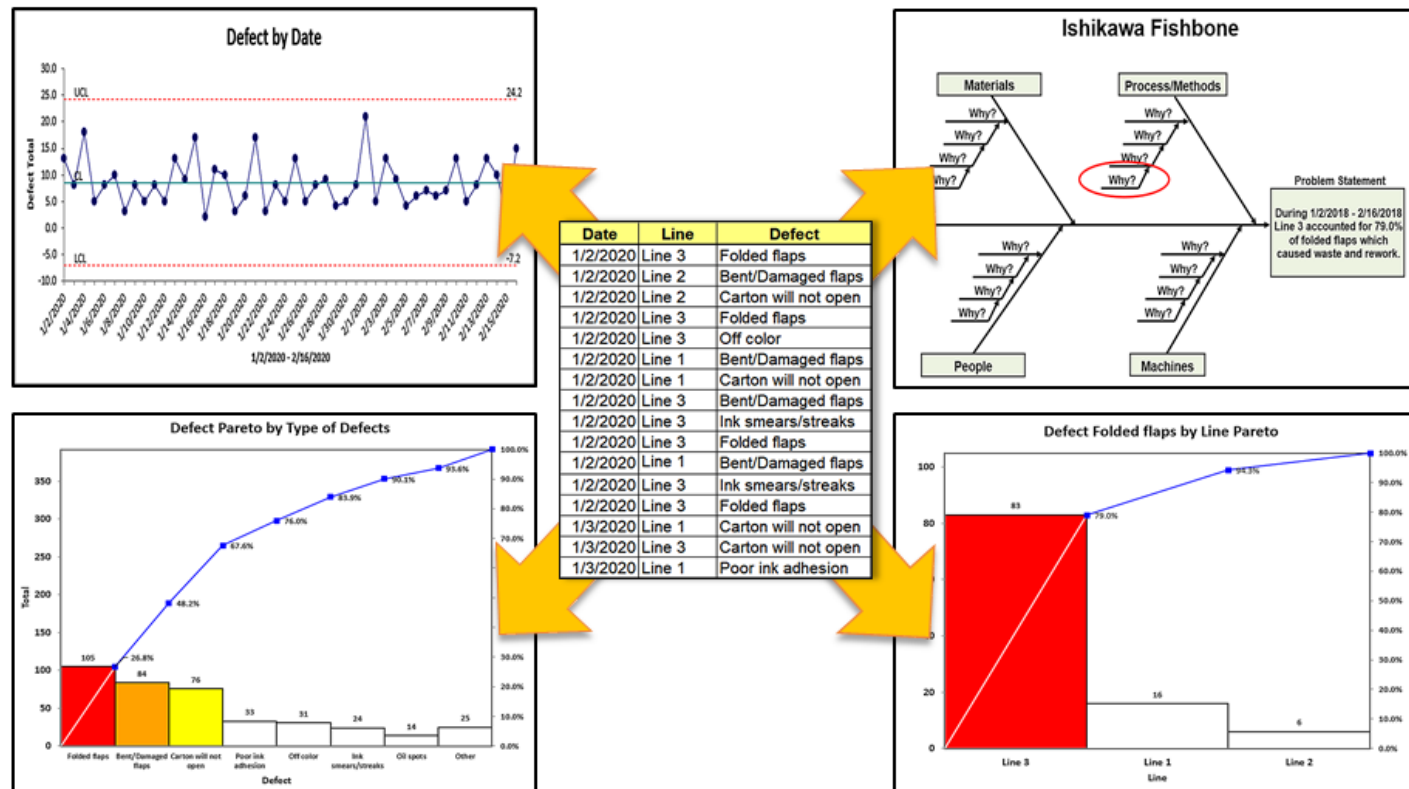
The Improvement Project Wizard:

- Summarizes your data in a pivot table
- Draws a control chart using the selected fields
- Draws Pareto charts using the remaining columns
- Creates a fishbone (Ishikawa) diagram from the “big bar” on the Pareto Chart



Date	Line	Defect
1/2/2020	Line 3	Folded flaps
1/2/2020	Line 2	Bent/Damaged flaps
1/2/2020	Line 2	Carton will not open
1/2/2020	Line 3	Folded flaps
1/2/2020	Line 3	Off color
1/2/2020	Line 1	Bent/Damaged flaps
1/2/2020	Line 1	Carton will not open

	A	B
1	Count of Line	
2	Defect	Total
3	Folded flaps	105
4	Bent/Damaged flaps	84
5	Carton will not open	76
6	Poor ink adhesion	33
7	Off color	31

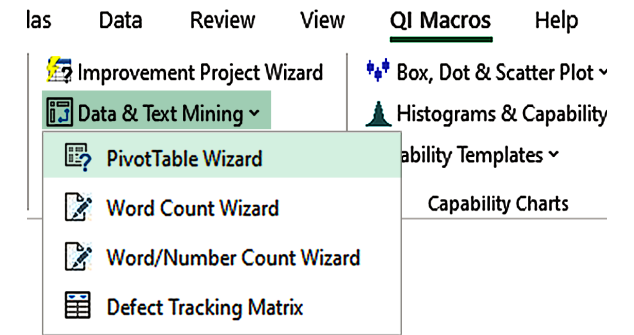


qimacros.com/data-mining-analysis-excel/data-mining-wizard

PivotTable Wizard

The QI Macros PivotTable Wizard can quickly summarize large amounts of raw data.

1. Make sure each column has a distinct heading. Check for misspellings or inconsistencies. Labels like "Hosp1" and "Hospital 1" are treated as two different values. (Tip: Use Excel's Find and Replace function to make these consistent.)
2. Click on one to four columns of data to include in the pivot table.



	A	B	C	D	E	F	G	H	I	J	K	L	M	N
	Region	POST DATE	ADM ENT	DIS DATE	AS	COS	FC	IN1	PT	DENIED CHARGES	ACCT BAL	INS BAL CALC	MEMO	
2	North	06/24/18	Hosp1	02/10/18	2/13/18	OL		X	AEH	O	543.07	543.07		DA
3	South	12/21/17	Hosp2	07/10/17	7/13/17	OL		X	BCP	E	215.4	215.4	215.4	DA
4	South	02/22/18	Hosp2	12/03/17	12/6/17			X	CGH	O	157.92	157.92	157.92	DA
5	South	05/20/18	Hosp3	10/17/17	10/20/17	OL		X	MAH	O	90.73	55.83	55.83	DA
6	North	07/12/18	Hosp1	05/04/18	5/7/18	AP		X	HEH	O	4103.78	4103.78	4103.78	DA
7	North	11/02/17	Hosp4	08/04/16	8/7/16	OL		F	PTB	E	3224.83	3224.83	3224.83	DA
8	North	11/17/17	Hosp5	04/12/17	4/15/17	OL		F	PTB	O	3291.76	3291.76	3291.76	DA
9	North	11/24/17	Hosp1	05/10/17	5/13/17	OL		F	PTB	O	13845.9	13845.9	13845.9	DA
10	North	11/24/17	Hosp4	09/13/17	9/16/17			F	PTB	O	1151	1151	1151	DA
11	North	12/08/17	Hosp6	09/21/17	9/24/17			F	PTB	O	797	797	45.38	DA
12	North	06/15/18	Hosp7	04/12/18	4/15/18			C	OT1	O	215	215	215	DA
13	North	06/22/18	Hosp5	07/24/16	7/27/16	OL		F	PTB	O	2124.86	1716.66	1716.66	DA
14	North	08/26/18	Hosp4	05/30/18	6/2/18			F	PTB	O	12	12	12	DA
15	North	09/02/18	Hosp6	08/05/18	8/8/18			F	PTB	O	304	304	304	DA
16	North	09/02/18	Hosp6	08/05/18	8/8/18			F	PTB	O	89	89	89	DA
17	North	09/02/18	Hosp6	08/05/18	8/8/18			F	PTB	O	89	89	89	DA
18	North	09/08/18	Hosp6	02/01/18	2/4/18	OL		F	PTB	O	3728	361	361	DA
19	South	10/26/17	Hosp2	07/22/16	7/25/16	OL		X	BAN	O	311.16	311.16	0	DC
20	South	10/28/17	Hosp2	12/19/16	12/22/16		MB	X	BAN	O	643.81	643.81	643.81	DC

3. Select the PivotTable Wizard from the Data Mining section of the QI Macros menu.
4. The QI Macros PivotTable Wizard creates a pivot table for you based on the frequency of values in each column.

Rearrange the pivot table as required, then highlight labels and data to draw QI Macros control charts and Pareto charts.

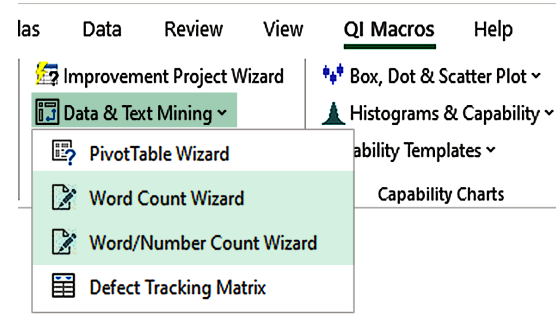
	A	B	C	D
1	Sum of DENIED CHARGES	Region		
2	ENT	North	South	Grand Total
3	Hosp1	18492.75		18492.75
4	Hosp2		32955.38	32955.38
5	Hosp3		23447.35	23447.35
6	Hosp4	4387.83		4387.83
7	Hosp5	5416.62		5416.62
8	Hosp6	5007		5007
9	Hosp7	215		215
10	Grand Total	33519.2	56402.73	89921.93

qimacros.com/training/videos/cross-tab-pivottable-wizard

Word/Number Count Wizards

Most data tracking systems contain note or comment fields for customer service reps, healthcare workers, and even customers. These fields contain interesting and valuable data, but it is often hard to analyze. The QI Macros Word Count Wizard simplifies this process by parsing the words out of sentences and paragraphs and creating pivot tables to count the occurrences of individual words and two-word phrases.

1. Highlight your data (omit the header row).
2. From the Data Mining section of the QI Macros menu, click Data & Text Mining and select Word Count Wizard or Word/Number Count Wizard. (Word/Number Count Wizard will count instances of text *and* numbers.)
3. QI Macros Word Count Wizard creates two pivot tables: one for single words and one for two-word phrases. (Word/Number Count Wizard will count instances of text *and* numbers.) The pivot tables give you a clearer view of your data. You can highlight data within the pivot table to draw Pareto charts for further insights.



MEMO TEXT - Wordcount
1 DA REJECT - DUP DOS (MULTIPLE VISITS SAME DAY). CLD AND TT SHELLY AT AETNA WAS TOLD THAT THIS SHOULD BE INCLUDED IN THE SURGERY CHARGES. E-MAILED GARY S TO SEE IF THIS IS CORRECT. THE SURGERY ACCT IS IN MC STATUS. CATHY X266
2 DANIEL FROM DAVIS WIRE 0 CALLED TOSAY THEY RECVD A W/C CLAIM FOR THIS PT AND THEY ARE NOT ASSOCIATED WITH DAVIS WIRE IN THAT REGARD...THE INS INFO IS INCORRECT...WILL DELETE AND REFER TO WC FOLLOWUP...ADAVIS
3 DA REJECT - DUP DOS (MULTIPLE VISITS SAME DAY). RECEIVED FROM AILHANDLERS EOB THAT THEY WILL NOT PAY CLAIM CALLED TT KATHY/ SHE STATED CLAIM NOT PAID BECAUSE THEY RECEIVED 2 CLAIMS FROM US WITH SAME DOS/ NON WERE MARKED CORR
4 DA REJECT - DUP DOS (MULTIPLE VISITS SAME DAY) RCVD EMAIL BACK FROM ED THERE WERE 2 ORDERS PLACE FOR CTS VISIT 002 AT 1607 AND THE SECOND ONE FOR 003 WAS WHILE PT WAS INPT AT 0509 SENDING ACCT TO APPEALS DEPT FOR APPEAL ERIC
5 DA REJECT - DUP DOS. REQ FROM FLO THE UP SO I CAN REKEY AND CALL FOR DUP OVERRIDE. CLAIM HAS SEVERAL DUPS. SANDI 26029
6 DA REJECT - DUP DOS. MEDCR DENIED FOR DUP. REQ FROM FLO A UB SO I CAN REKEY AND CALL FOR A DUP OVERRIDE. SANDI 26029
7 DA REJECT - DUP DOS (MULTIPLE VISITS SAME DAY). DELETED FRM MUO AS AUDIT REQ'D REBILL. CSCHMIDT 22984
8 DA REJECT - DUP DOS (MULTIPLE VISITS SAME DAY). DELTED CLM THAT WAS DENIED IN OCTOBER OFF MUO SUSPENCE. CSCHMIDT 22984

Word Count Results

Only counts and displays text

	A	B	C	D	E
1	Count of Word			Count of Two-Word Phrases	
2	Word	Total		Two-Word Phrases	Total
3	dup	11		da reject	8
4	dos	9		reject dup	8
5	reject	8		dup dos	8
6	da	8		multiple visits	6
7	same	7		same day	6
8	multiple	6		dos multiple	6
9	day	6		visits same	6
10	visits	6		rekey call	2
11	claim	4		davis wire	2
12	req	3		req flo	2
13	denied	2		sandi da	2
14	call	2		call dup	2
15	sandi	2		dup override	2
16	called	2		override claim	1
17	pt	2		info incorrect	1
18	tt	2		called tosay	1
19	rekey	2		charges mailed	1
20	acct	2		audit req	1
21	davis	2		claim called	1
22	cschmidt	2		rebill cschmidt	1

Word/Number Count Results

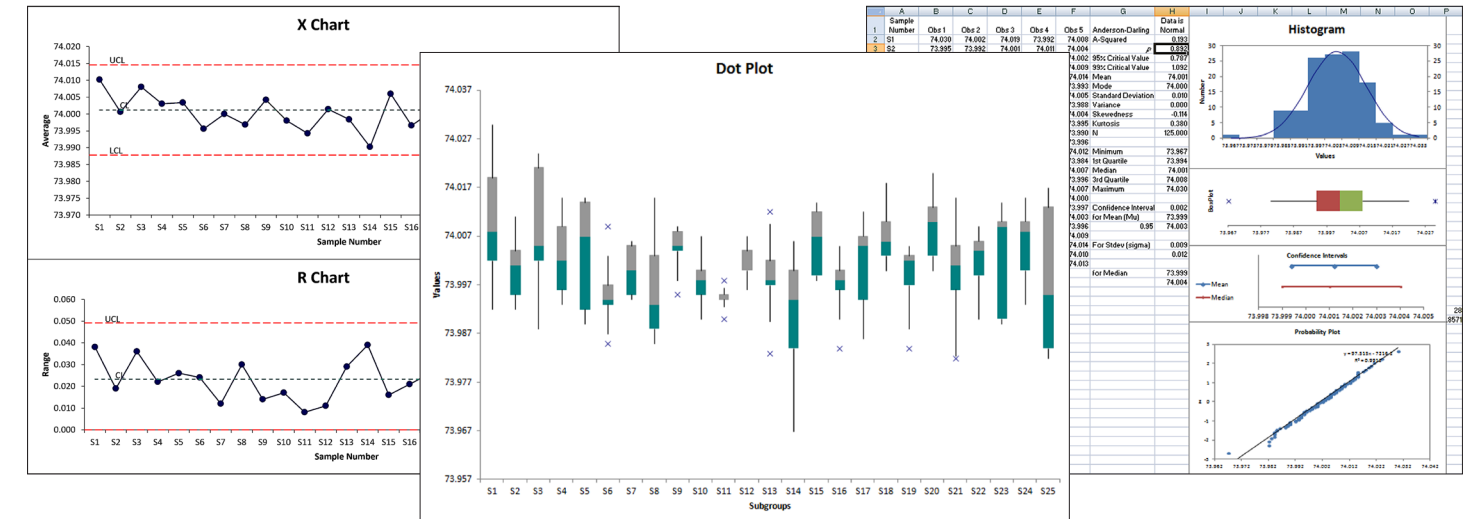
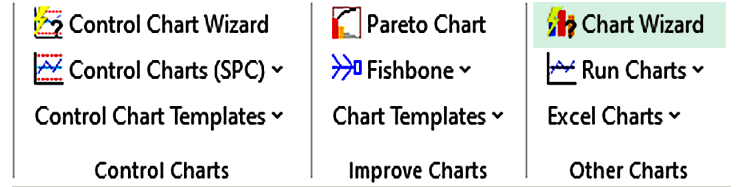
Counts instances of text and numbers

	A	B	C	D	E
1	Count of Word			Count of Two-Word Phrases	
2	Word	Total		Two-Word Phrases	Total
3	dup	11		da reject	8
4	dos	9		reject dup	8
5	da	8		dup dos	8
6	reject	8		visits same	6
7	same	7		same day	6
8	visits	6		multiple visits	6
9	multiple	6		dos multiple	6
10	day	6		call dup	2
11	claim	4		req flo	2
12	req	3		rekey call	2
13	wire	2		cschmidt 22984	2
14	pt	2		sandi 26029	2
15	muo	2		26029 da	2
16	call	2		davis wire	2
17	davis	2		dup override	2
18	rekey	2		muo suspence	1
19	cschmidt	2		status cathy	1
20	called	2		received ailhandlers	1
21	override	2		appeals dept	1
22		22984		ins info	1

qimacros.com/training/videos/word-count-wizard

Chart Wizard

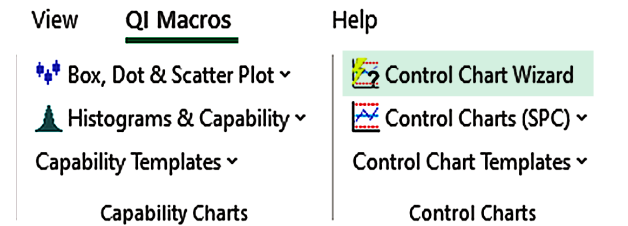
If you are confused about when to use other chart types, the QI Macros Chart Wizard will create all of the most probable charts for your data and run descriptive statistics.



qimacros.com/quality-tools/chart-wizard

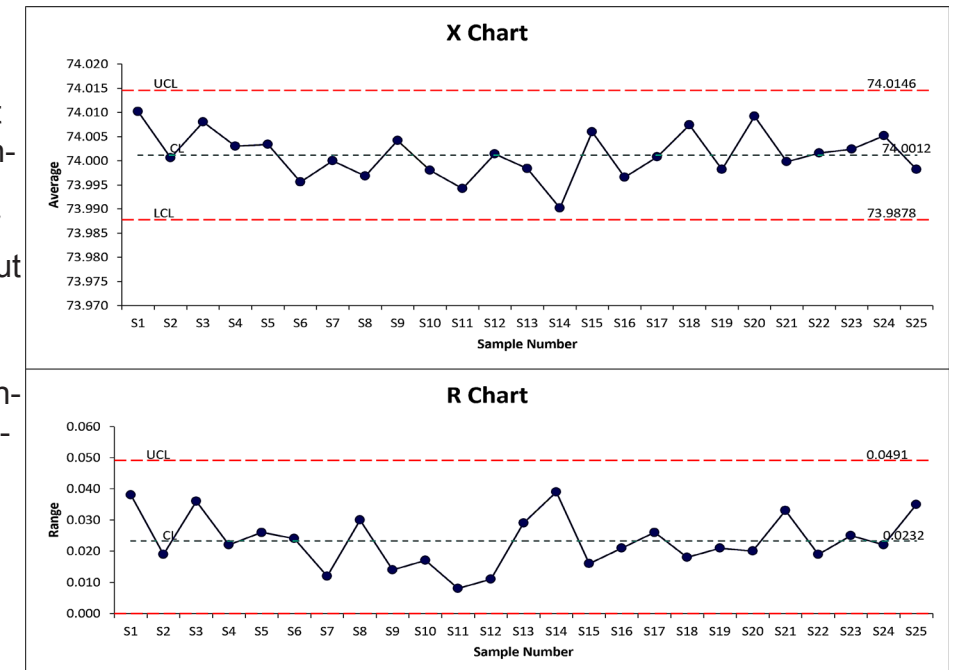
Control Chart Wizard

If you are unsure which type of control chart to use, the QI Macros Control Chart Wizard will analyze your data and create the right control chart automatically.



In addition to generating a control chart, QI Macros will automatically insert your data into a control chart *template* which may be used for on-going data collection. (Refer to the Control Charts Template section of this book for more information about templates.)

Learn how QI Macros selects a control chart: qimacros.com/free-excel-tips/choosing-control-charts.



qimacros.com/training/videos/control-chart-wizard

Control Chart Templates Wizard

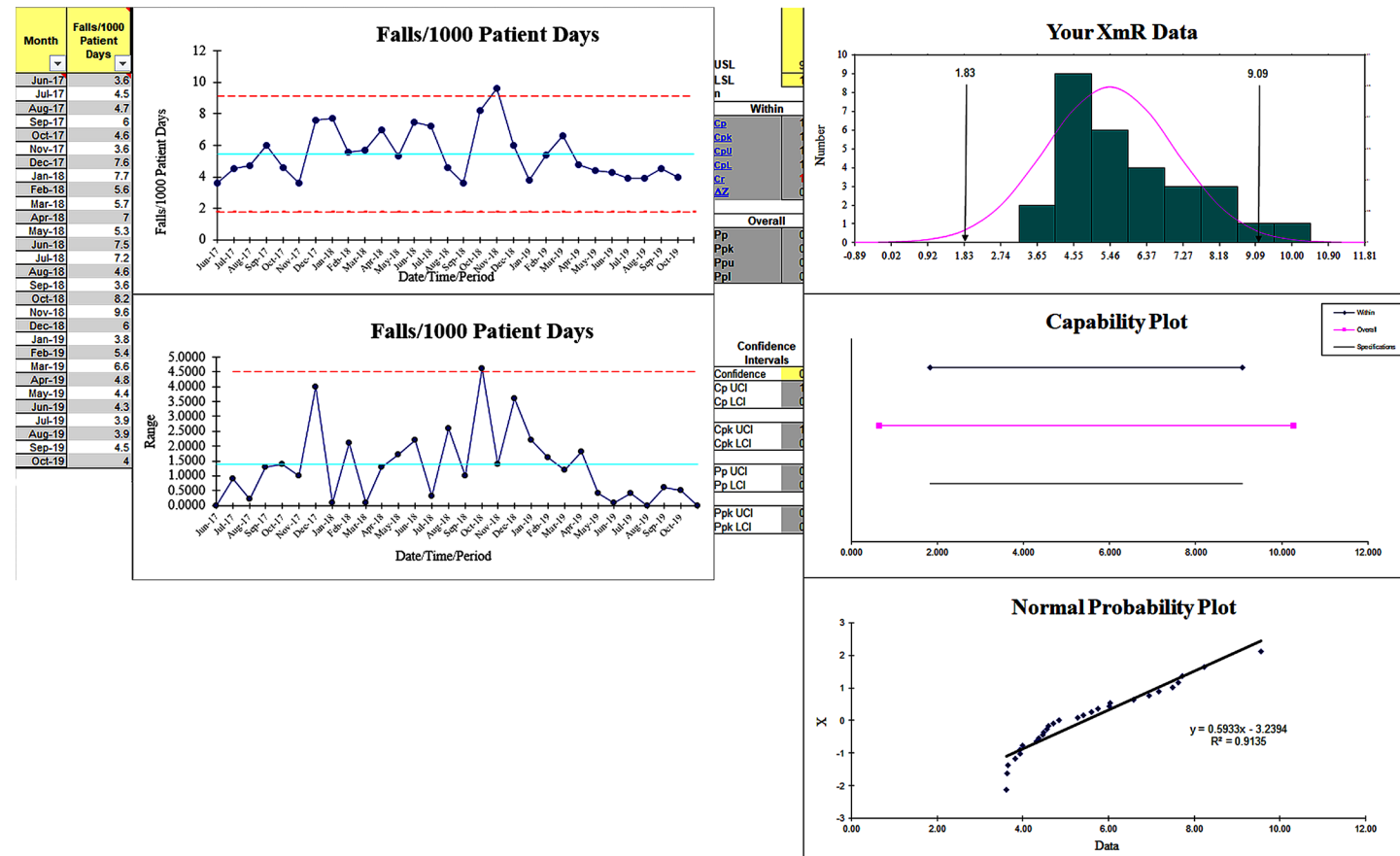
The QI Macros Chart Templates Wizard analyzes your data and places your data in the right control chart template for you.

1. Highlight your data.

	A	B
1	Month	Falls/1000 Patient Days
2	Jun-18	3.6
3	Jul-18	4.5
4	Aug-18	4.7
5	Sep-18	6.0
6	Oct-18	4.6
7	Nov-18	3.6

2. Click Control Chart Templates on the QI Macros menu and select Chart Templates Wizard.

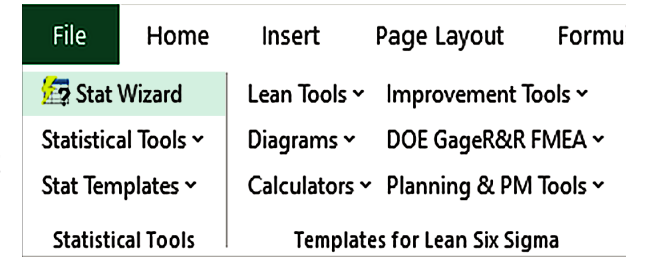
3. The QI Macros Chart Templates Wizard will place your data into the correct template. Your charts will populate to the right of your data set automatically.



qimacros.com/control-chart/control-chart-template-wizard

Stat Wizard

If you are confused about which statistical tool to use, the QI Macros Stat Wizard will quickly analyze your data and perform statistical analysis. Highlight your data and select Stat Wizard from the QI Macros menu.



The Stat Wizard will determine if your data has 1, 2, or more columns of data. Depending on the number of columns and whether the data has decimals or integers, it will run the following statistics:

1 Column

- Descriptive Statistics
- 1 Sample t Test for Means

2 Columns

- F-Test for Variances
- t-Test for Means
- Chi-Square Table for independence (if data is integers)

3+ Columns

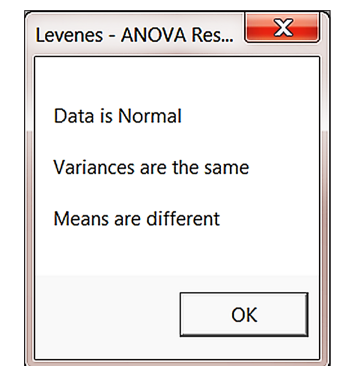
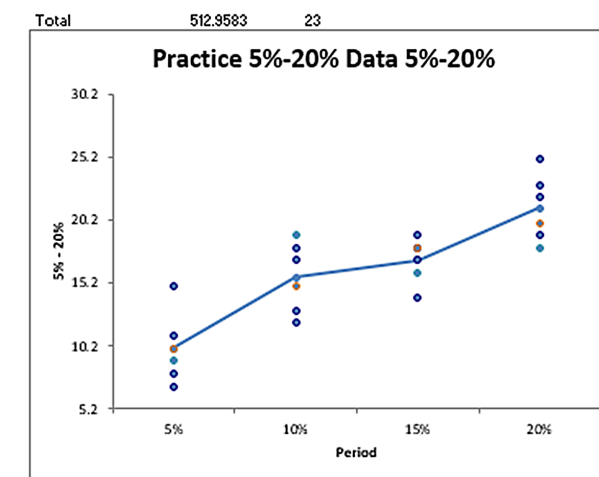
- Descriptive Statistics (for each individual data column)
- ANOVA for Means
- Levene's Test for Variances
- Chi-Square Table for independence (if data is integers)

Hardwood Concentration %	5%	10%	15%	20%
Obs1	7	12	14	19
Obs2	8	17	18	25
Obs3	15	13	19	22
Obs4	11	18	17	23
Obs5	9	19	16	18
Obs6	10	15	18	20
	10	16	17	21

Anova: Single Factor					α = 0.05		
SUMMARY					LSD	3.072423	
Groups	Count	Sum	Average	Variance	HSD	4.122257	
5%	6	60	10	8	Scheffe	5.797322	
10%	6	94	15.66667	7.866667	Post Hoc 5%	10%	15%
15%	6	102	17	3.2	10%	5.866667	1.333333
20%	6	127	21.16667	6.966667	15%	7	1.333333
					20%	11.167	5.5 4.166667

Colored cells have significant mean differences

ANOVA							Reject Null Hypothesis because p < 0.05 (Means are Different)	
Source of Variation	SS	df	MS	F	P-Value	F crit		
Between Groups	382.7917	3	127.5972	19.60521	0.000	3.098391		
Within Groups	130.1667	20	6.508333					



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