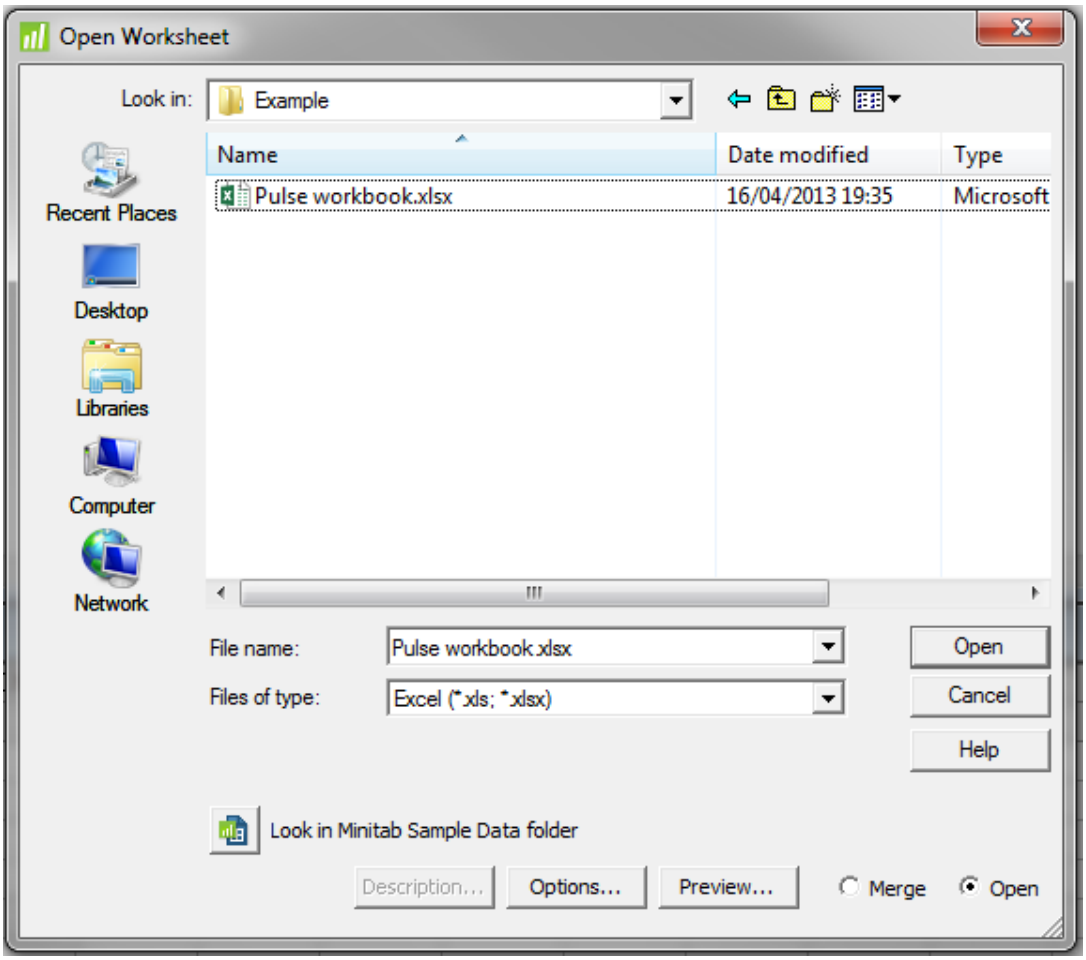
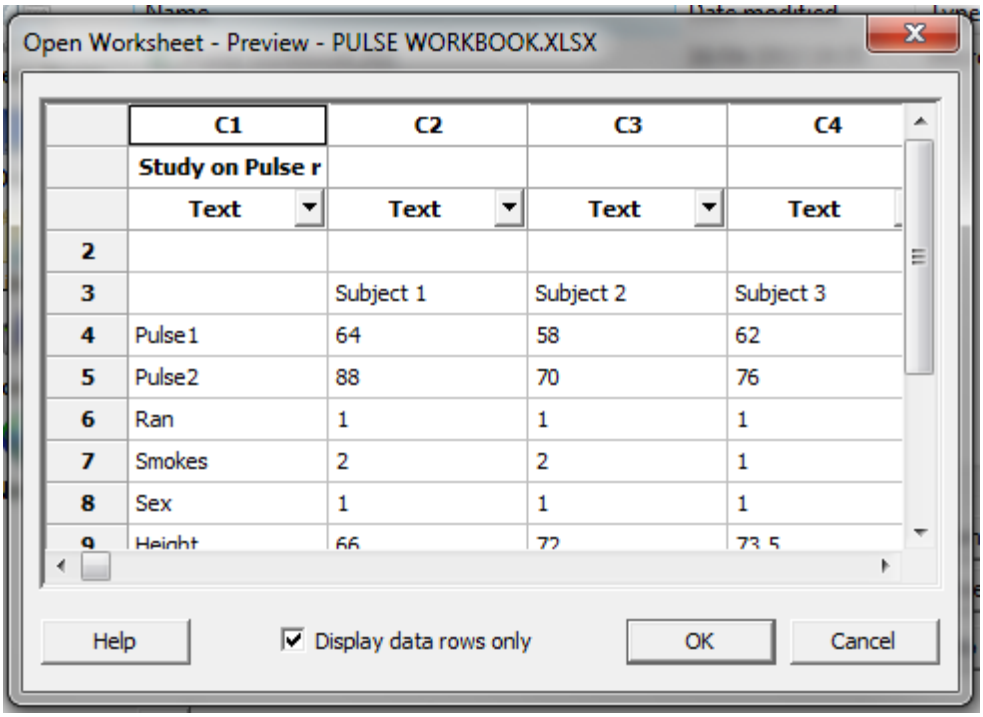
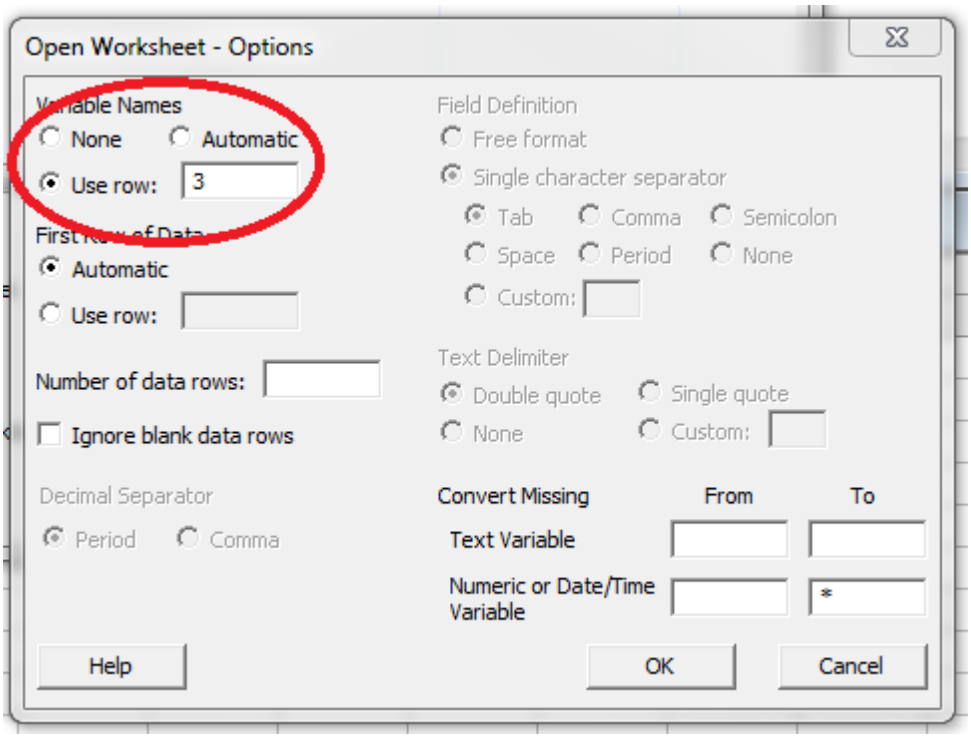
Chapter 1, Worksheet, Data Management, and the Calculator

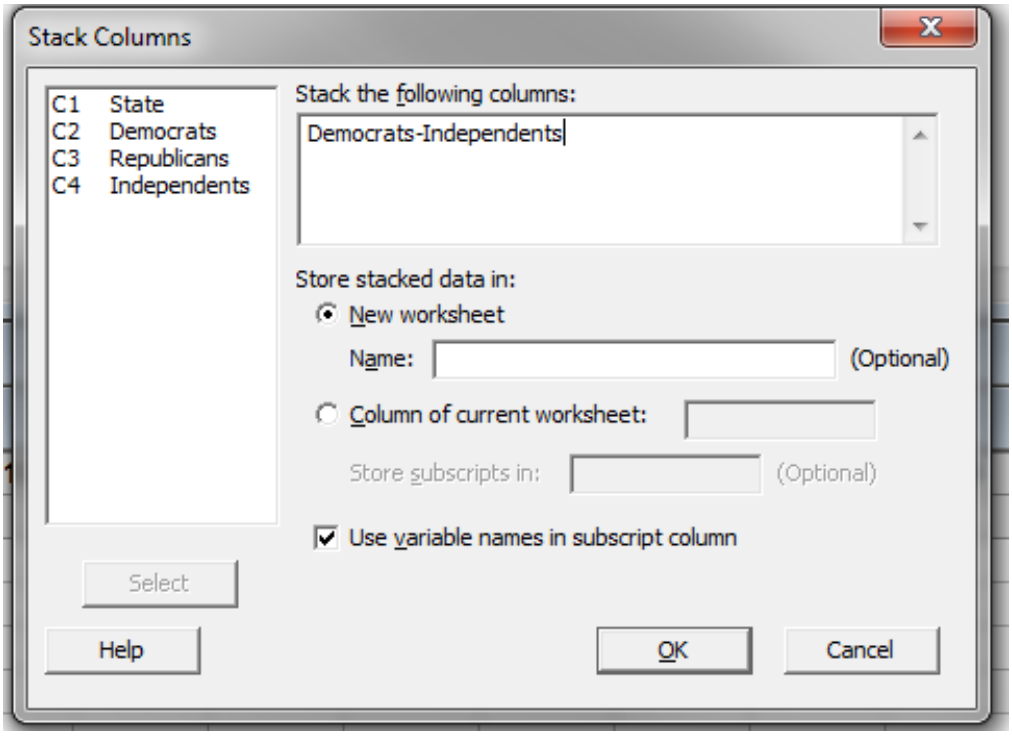
↓	C1	C2	C3	C4	C5	C6	C7	C8
	Pulse1	Pulse2	Ran	Smokes	Sex	Height	Weight	Activity
1	64	88	1	2	1	66.00	140	2
2	58	70	1	2	1	72.00	145	2
3	62	76	1	1	1	73.50	160	3
4	66	78	1	1	1	73.00	190	1
5	64	80	1	2	1	69.00	155	2
6	74	84	1	2	1	73.00	165	1
7	84	84	1	2	1	72.00	150	3
8	68	72	1	2	1	74.00	190	2
9	62	75	1	2	1	72.00	195	2
10	76	118	1	2	1	71.00	138	2
11	90	94	1	1	1	74.00	160	1



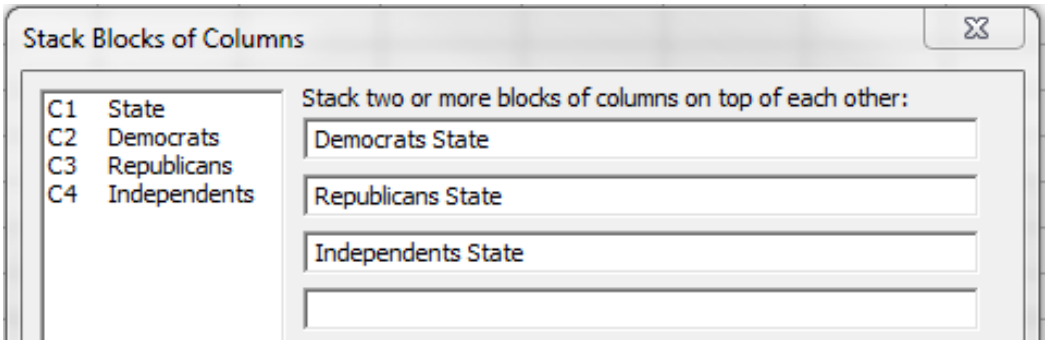

Open Worksheet - Preview - PULSE WORKBOOK.XLSX
C1
C2
C3
C4
Study on Pulse r
Text
Text
Text
Text
2
3
Subject 1
Subject 2
Subject 3
4
Pulse1
64
58
62
5
Pulse2
88
70
76
6
Ran
1
1
1
7
Smokes
2
2
1
8
Sex
1
1
1
9
Height
66
72
73.5
Help
Display data rows only
OK
Cancel


Open Worksheet - Options
Variable Names
None
Automatic
Use row:
3
First Row of Data
Automatic
Use row:
Number of data rows:
Ignore blank data rows
Decimal Separator
Period
Comma
Field Definition
Free format
Single character separator
Tab
Comma
Semicolon
Space
Period
None
Custom:
Text Delimiter
Double quote
Single quote
None
Custom:
Convert Missing
From
To
Text Variable
Numeric or Date/Time Variable
*
Help
OK
Cancel

	State	Democrats	Republicans	Independents
1	Alabama	0	2	0
2	Alaska	0	2	0
3	Arizona	0	2	0
4	Arkansas	2	0	0
5	California	2	0	0
6	Colorado	1	1	0
7	Connecticut	2	0	0
8	Delaware	2	0	0
9	Florida	1	1	0
10	Georgia	0	2	0
11	Hawaii	2	0	0
12	Idaho	0	2	0
13	Illinois	2	0	0

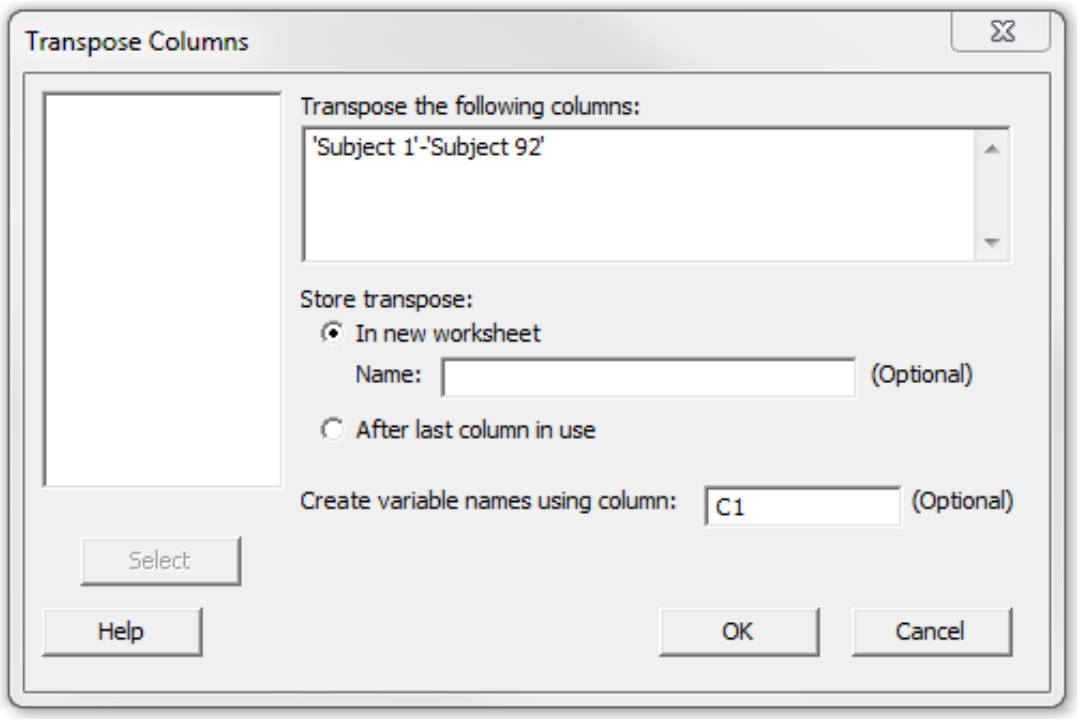


↓	C1-T	C2
	Subscripts	
1	Democrats	0
2	Democrats	0
3	Democrats	0
4	Democrats	2
5	Democrats	2
6	Democrats	1
7	Democrats	2
8	Democrats	2
9	Democrats	1
10	Democrats	0
11	Democrats	2
12	Democrats	0

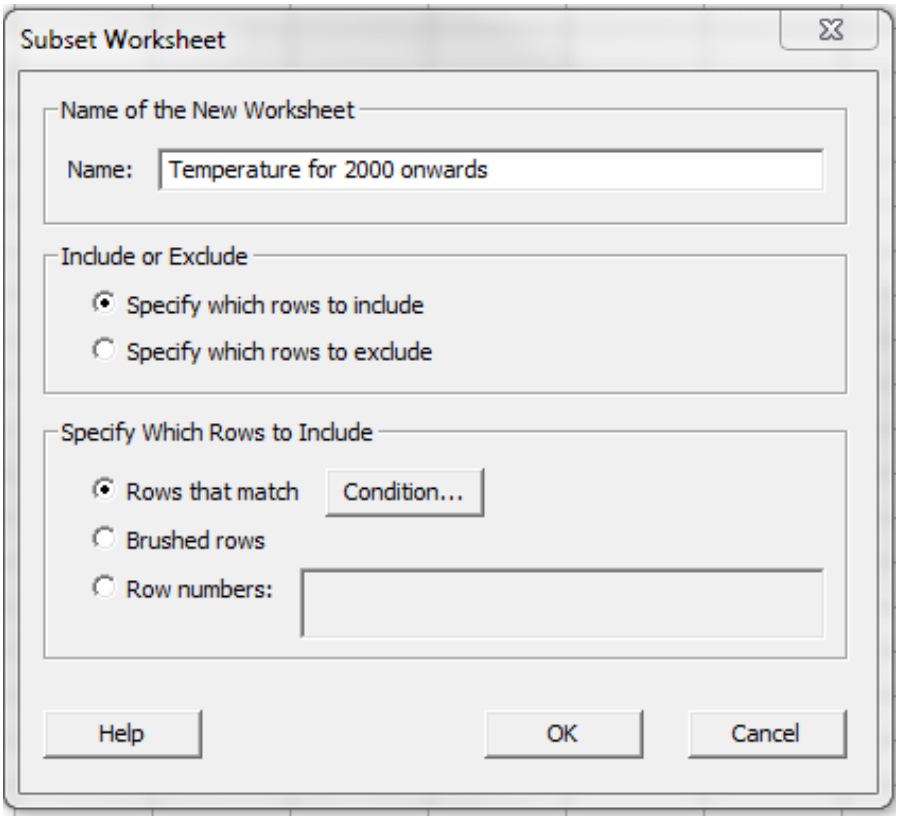


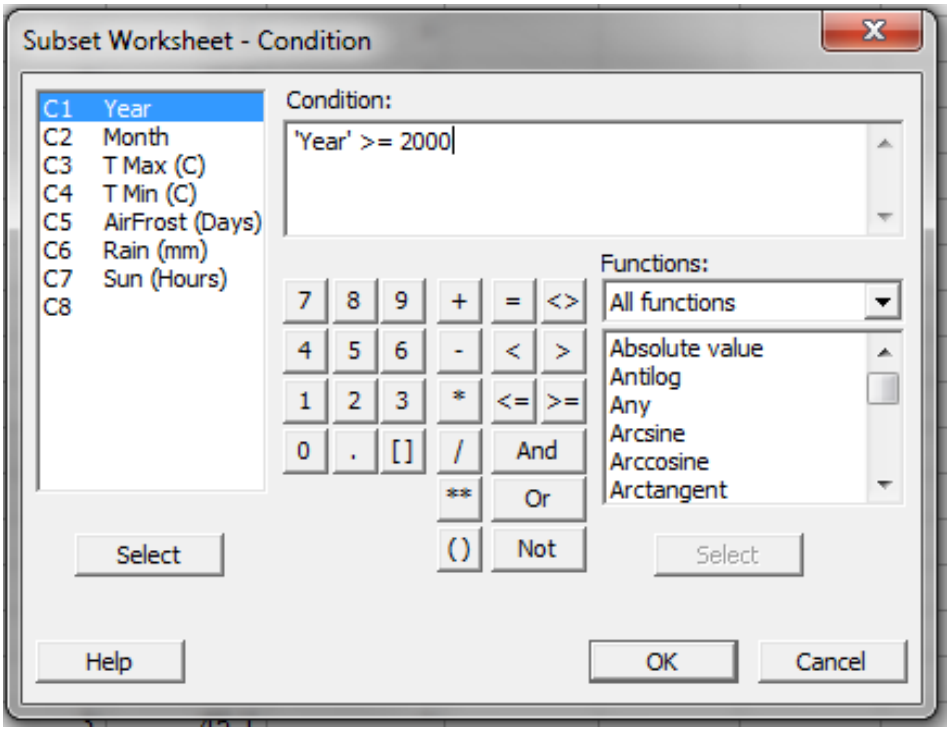
↓	C1-T	C2	C3-T
	Subscripts		
1	Democrats	0	Alabama
2	Democrats	0	Alaska
3	Democrats	0	Arizona
4	Democrats	2	Arkansas
5	Democrats	2	California
6	Democrats	1	Colorado
7	Democrats	2	Connecticut
8	Democrats	2	Delaware

↓	C1-T	C2	C3	C4	C5	C6	C7
		Subject 1	Subject 2	Subject 3	Subject 4	Subject 5	Subject 6
1	Pulse1	64	58	62.0	66	64	74
2	Pulse2	88	70	76.0	78	80	84
3	Ran	1	1	1.0	1	1	1
4	Smokes	2	2	1.0	1	2	2
5	Sex	1	1	1.0	1	1	1
6	Height	66	72	73.5	73	69	73
7	Weight	140	145	160.0	190	155	165
8	Activity	2	2	3.0	1	2	1

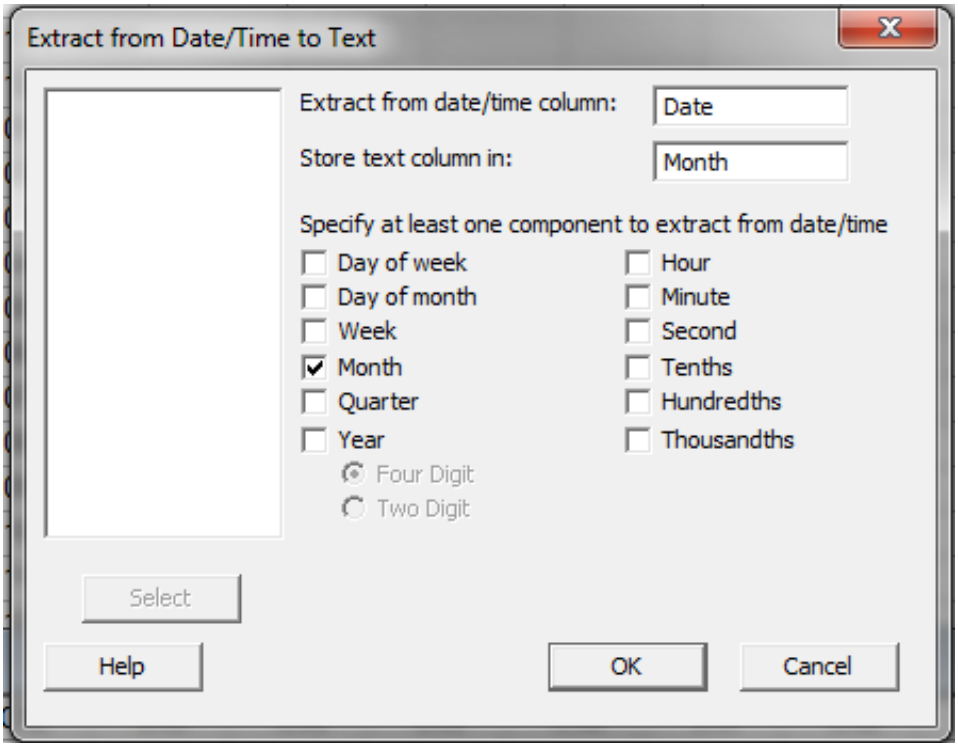


↓	C1-T	C2-T	C3	C4	C5	C6
	Year	Month	T Max (C)	T Min (C)	AirFrost (Days)	Rain (mm)
1	1853	1	8.4	2.7	4	62.8
2	1853	2	3.2	-1.8	19	29.3
3	1853	3	7.7	-0.6	20	25.9
4	1853	4	12.6	4.5	0	60.1
5	1853	5	16.8	6.1	0	59.5
6	1853	6	20.1	10.7	0	82.0
7	1853	7	21.2	12.2	0	86.2
8	1853	8	20.2	10.8	0	72.3
9	1853	9	17.3	8.4	0	51.3
10	1853	10	13.9	7.4	0	102.3
11	1853	11	8.7	2.3	10	49.6
12	1853	12	3.7	-1.3	19	10.7
13	1854	1	6.7	1.5	11	54.5
14	1854	2	8.0	0.6	12	22.6
15	1854	3	11.2	2.2	8	10.6

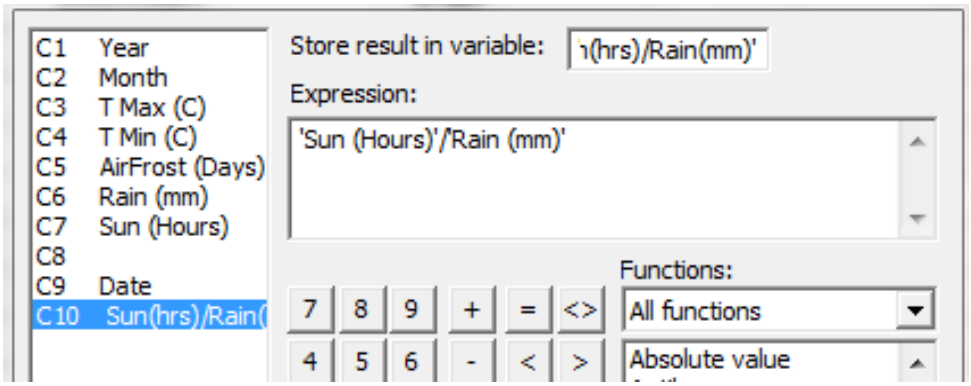




Date
05/01/2000
06/01/2000
07/01/2000
08/01/2000
09/01/2000
10/01/2000
11/01/2000
12/01/2000
01/01/2001

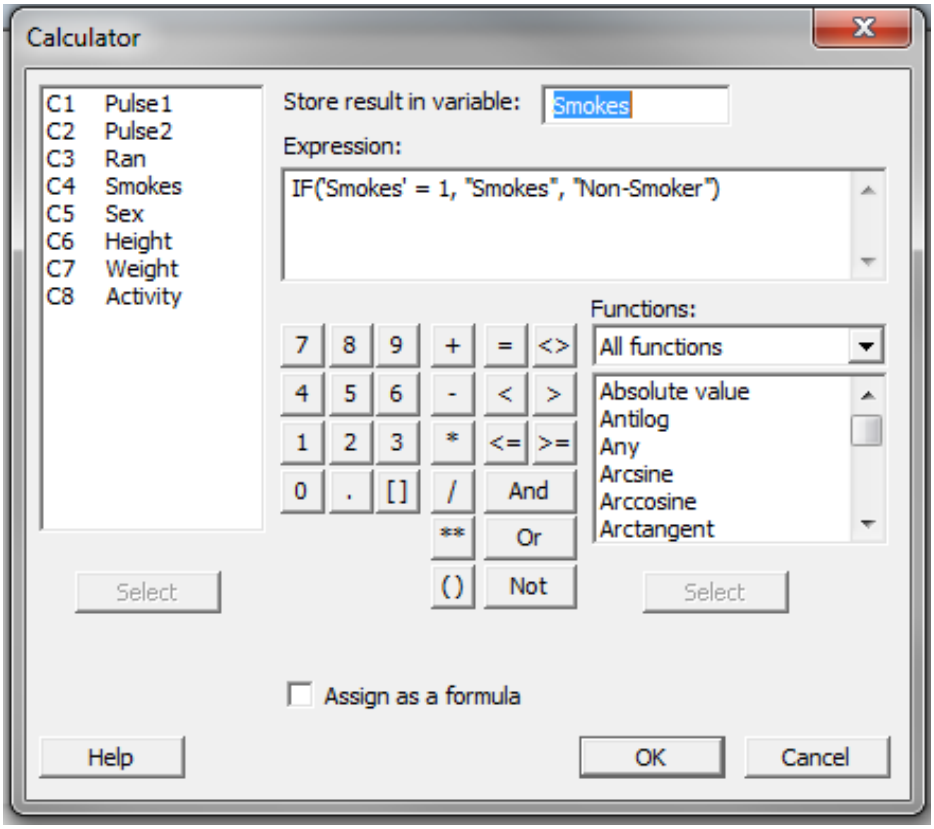


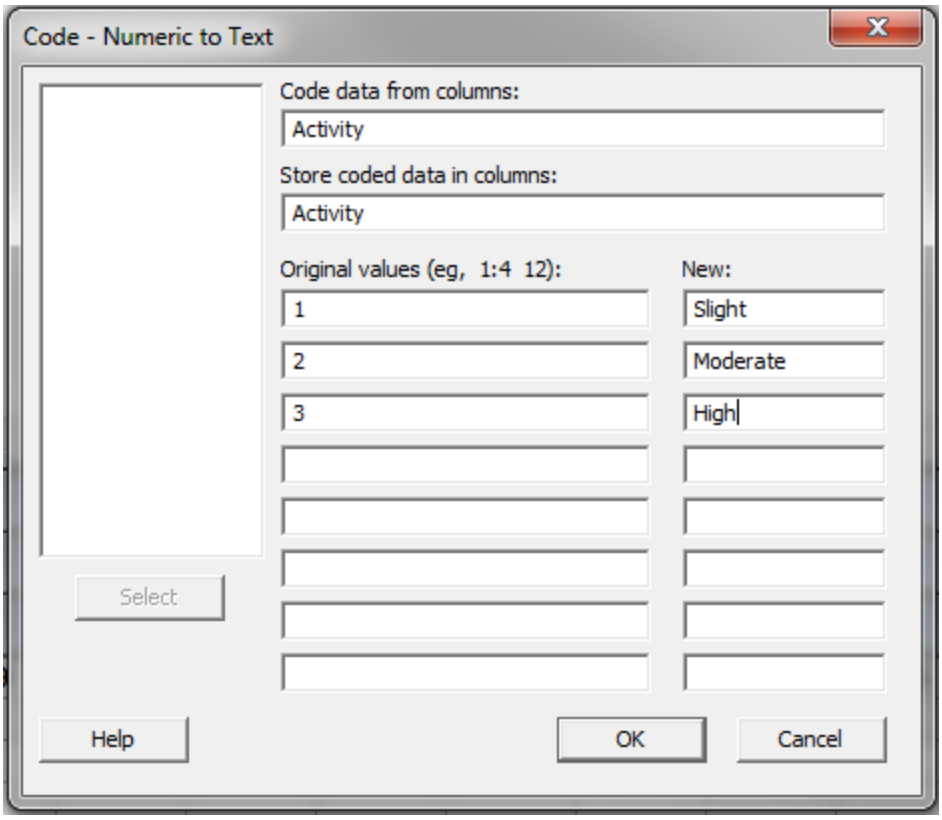
C6	C7
Rain (mm)	Sun (Hours)
67.7	189.8
19.4	164.6
28.5	161.2
58.3	209.4
87.2	126.1
119.5	83.9
99.1	69.2
99.8	51.9
57.4	83.3
68.6	85.0

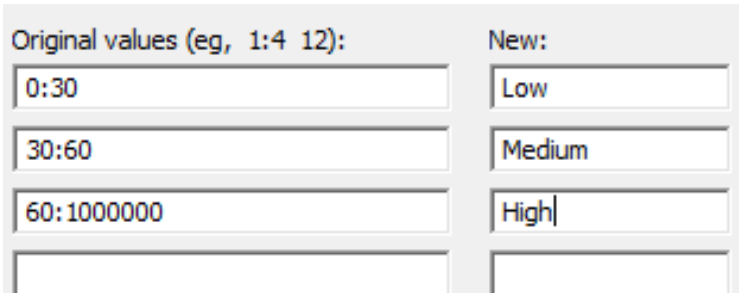


C10
Rain/Sun
0.72021
0.59160
1.61597
1.87447

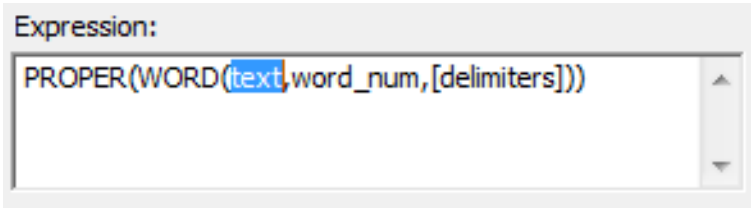
Pulse1	Pulse2	Ran	Smokes	Sex	Height	Weight	Activity
64	88	1	2	1	66.00	140	2
58	70	1	2	1	72.00	145	2
62	76	1	1	1	73.50	160	3
66	78	1	1	1	73.00	190	1
64	80	1	2	1	69.00	155	2
74	84	1	2	1	73.00	165	1

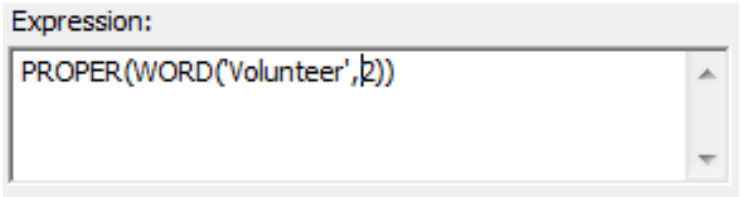

Calculator
C1 Pulse1
C2 Pulse2
C3 Ran
C4 Smokes
C5 Sex
C6 Height
C7 Weight
C8 Activity
Store result in variable: Smokes
Expression:
IF('Smokes' = 1, "Smokes", "Non-Smoker")
7 8 9 + = <>
4 5 6 - < >
1 2 3 * <= >=
0 . [] / And
** Or
() Not
Functions:
All functions
Absolute value
Antilog
Any
Arcsine
Arccosine
Arctangent
Select
Select
Assign as a formula
Help
OK
Cancel


Code - Numeric to Text
Code data from columns:
Activity
Store coded data in columns:
Activity
Original values (eg, 1:4 12):
New:
1
Slight
2
Moderate
3
High
Select
Help
OK
Cancel



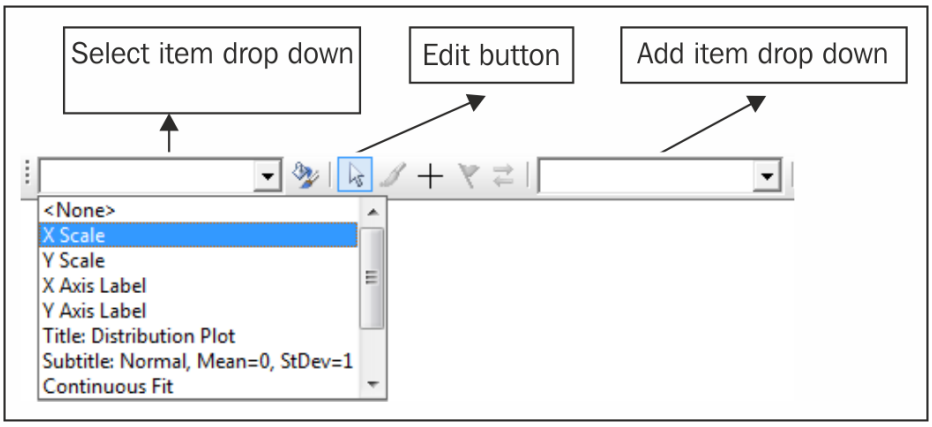
Volunteer
Joan Sherrif
Nicholas Kouiden
Robert thompson
katie mclane
Sarah roberts

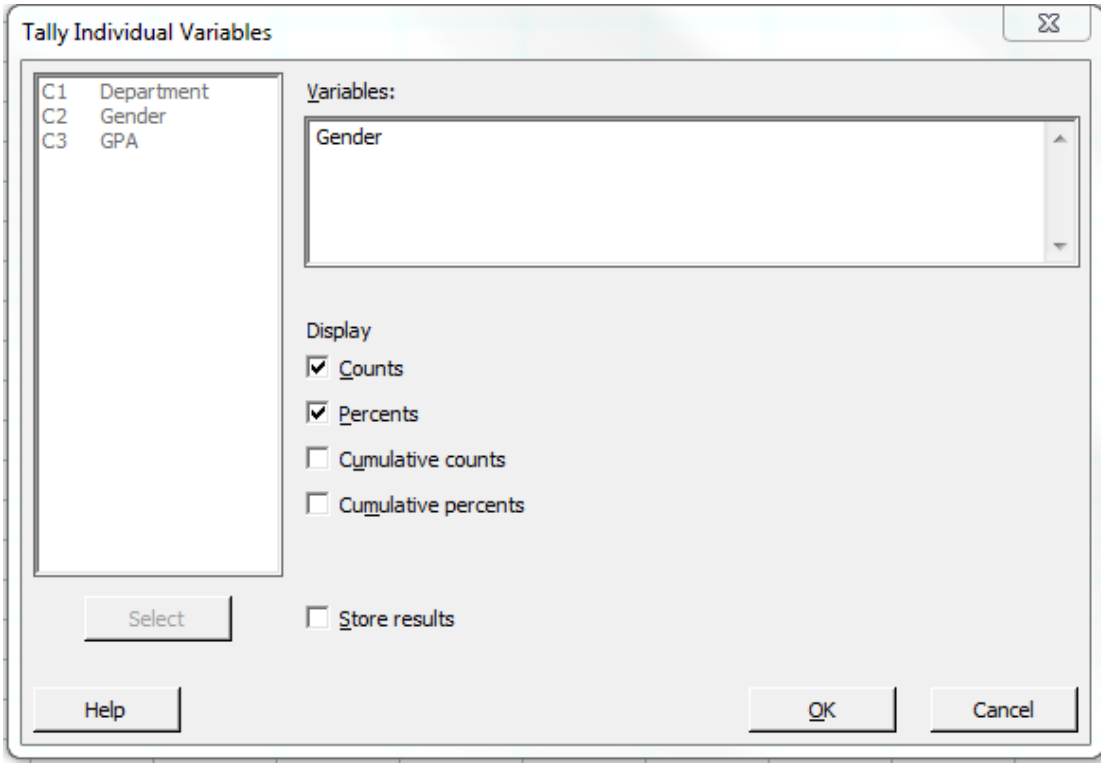




Volunteer	Surname
Joan Sherrif	Sherrif
Nicholas Kouiden	Kouiden
Robert thompson	Thompson
katie mclane	Mclane
Sarah roberts	Roberts

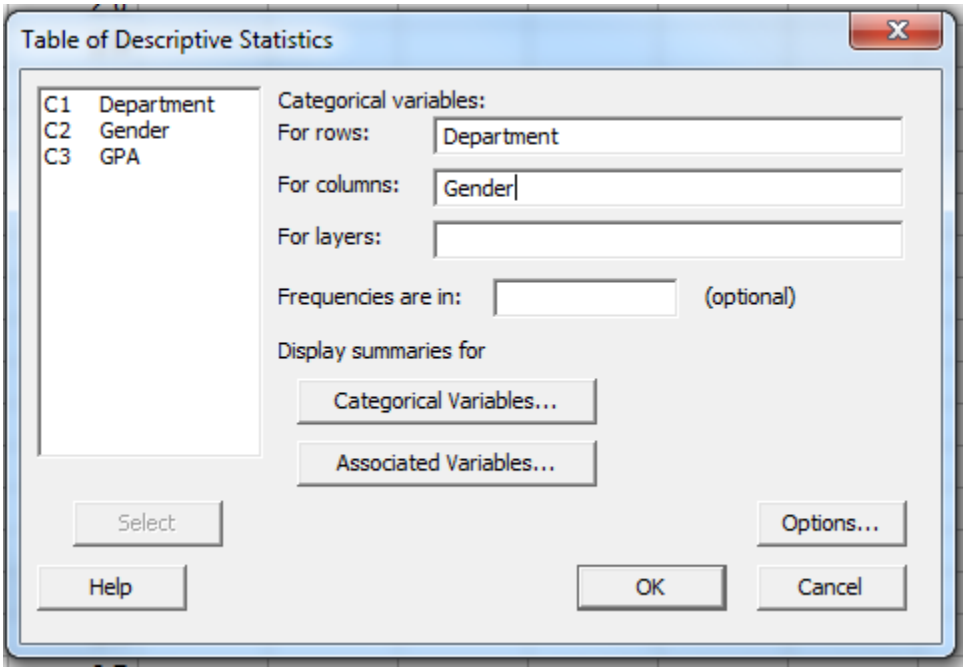
Chapter 2, Tables and Graphs





Tally for Discrete Variables: Gender

Gender	Count	Percent
F	26	52.00
M	24	48.00
N=	50	

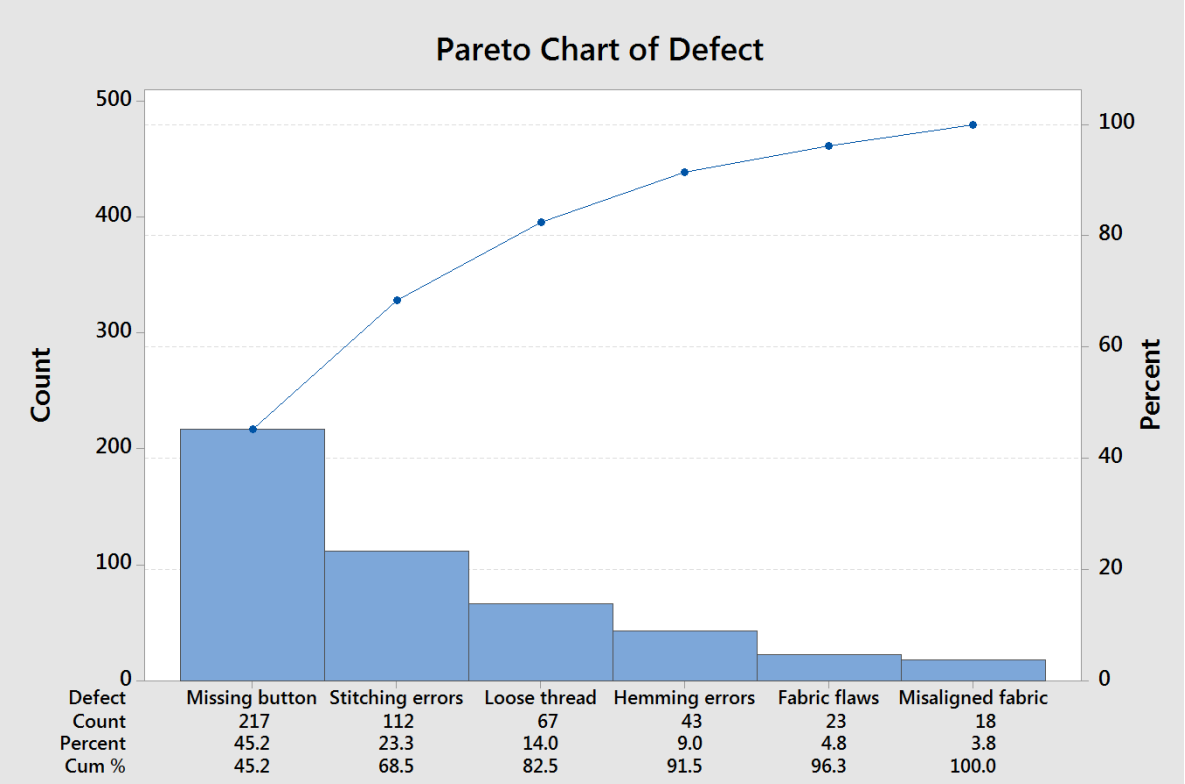


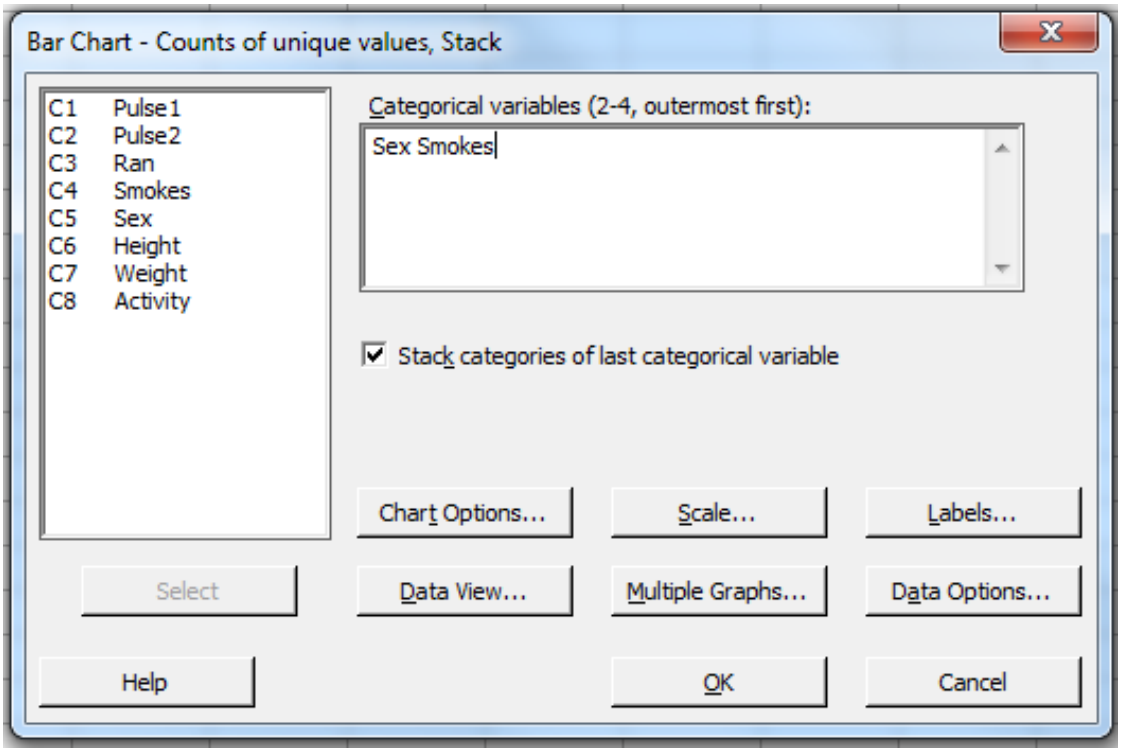
Tabulated statistics: Department, Gender

Rows: Department Columns: Gender

	F	M	All
Economics	2.833	3.070	2.928
	15	10	25
Stats	3.027	2.793	2.896
	11	14	25
All	2.915	2.908	2.912
	26	24	50

Cell Contents: GPA : Mean
Count


Pareto Chart of Defect
Count
Percent
500
400
300
200
100
0
100
80
60
40
20
0
Defect Missing button Stitching errors Loose thread Hemming errors Fabric flaws Misaligned fabric
Count 217 112 67 43 23 18
Percent 45.2 23.3 14.0 9.0 4.8 3.8
Cum % 45.2 68.5 82.5 91.5 96.3 100.0


Bar Chart - Counts of unique values, Stack
C1 Pulse1
C2 Pulse2
C3 Ran
C4 Smokes
C5 Sex
C6 Height
C7 Weight
C8 Activity
Categorical variables (2-4, outermost first):
Sex Smokes
Stack categories of last categorical variable
Chart Options...
Scale...
Labels...
Select
Data View...
Multiple Graphs...
Data Options...
Help
OK
Cancel

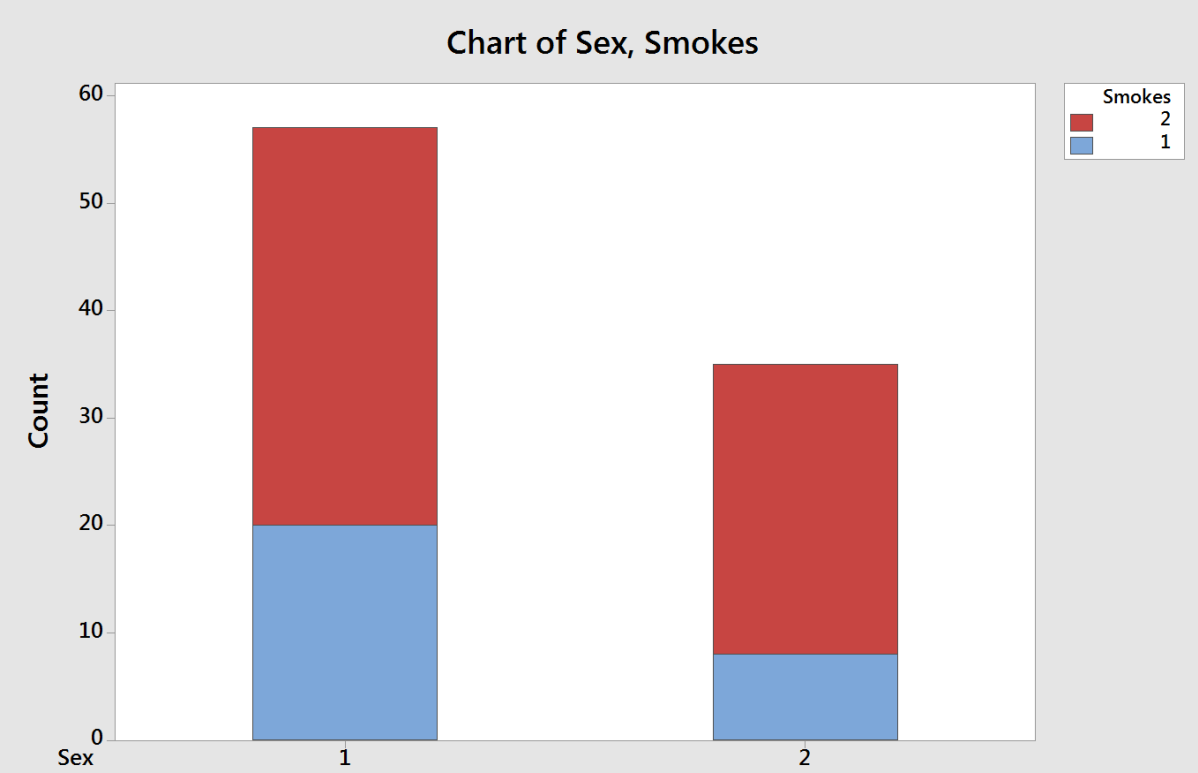
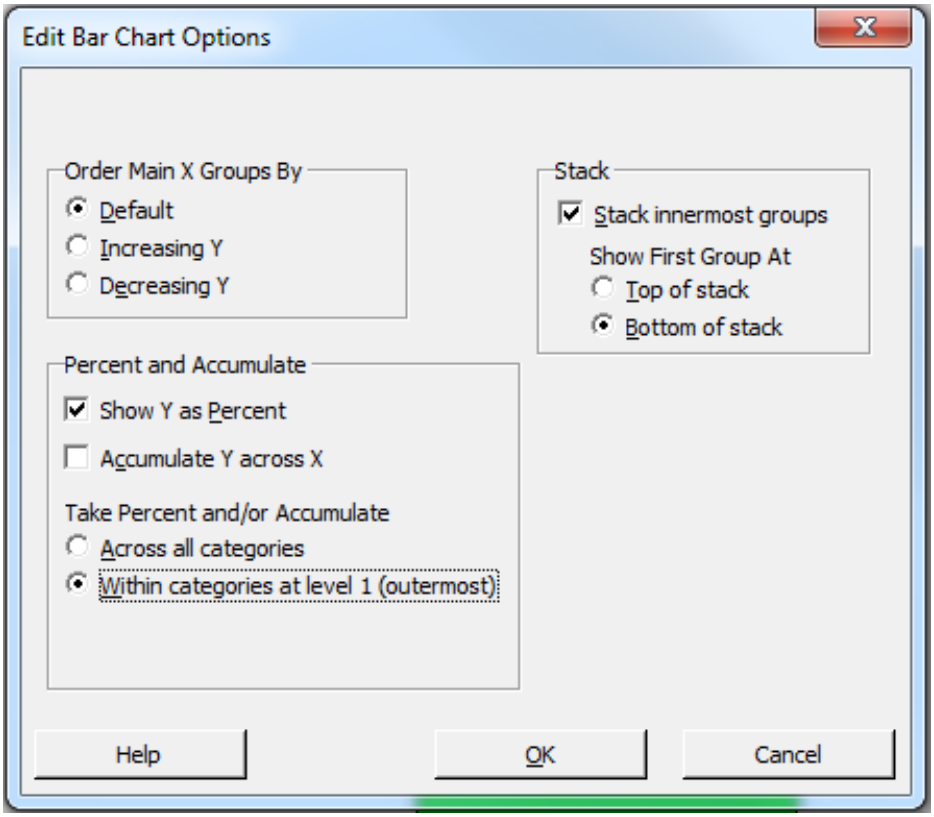


Chart of Sex, Smokes
Count
60
50
40
30
20
10
0
Sex
1
2
Smokes
2
1


Edit Bar Chart Options
Order Main X Groups By
Default
Increasing Y
Decreasing Y
Stack
Stack innermost groups
Show First Group At
Top of stack
Bottom of stack
Percent and Accumulate
Show Y as Percent
Accumulate Y across X
Take Percent and/or Accumulate
Across all categories
Within categories at level 1 (outermost)
Help
OK
Cancel

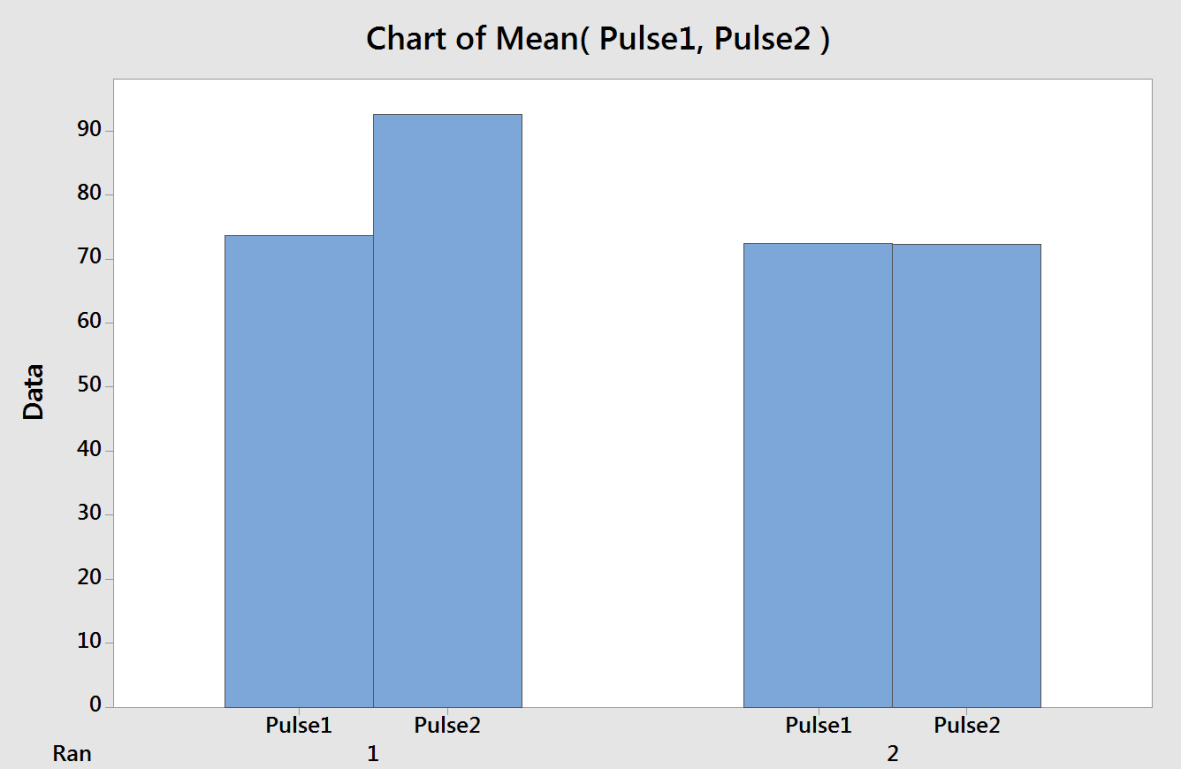
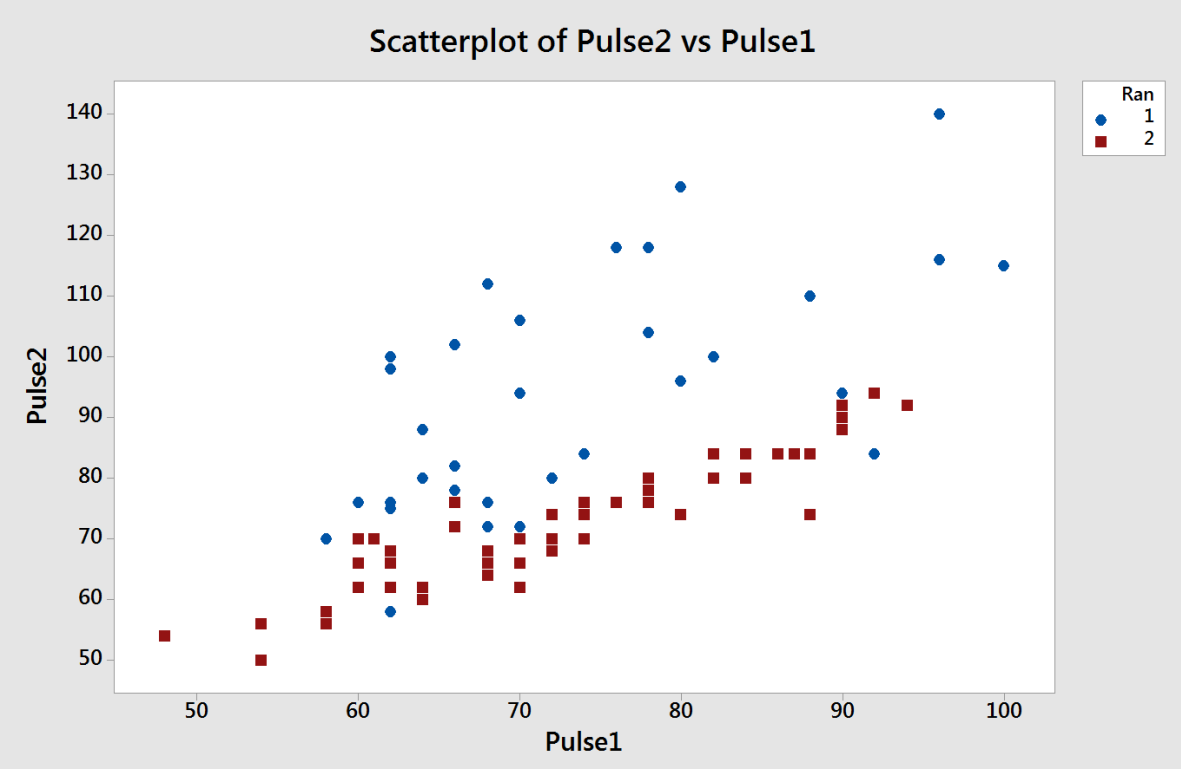
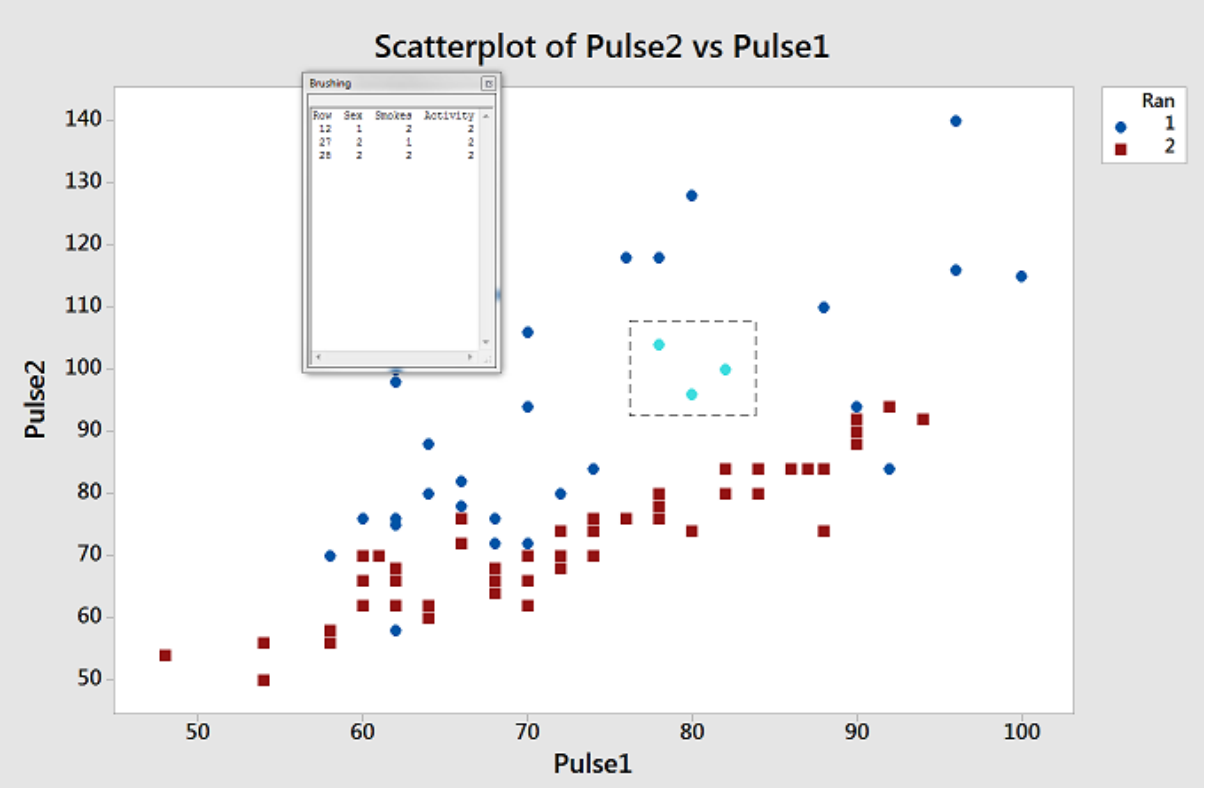
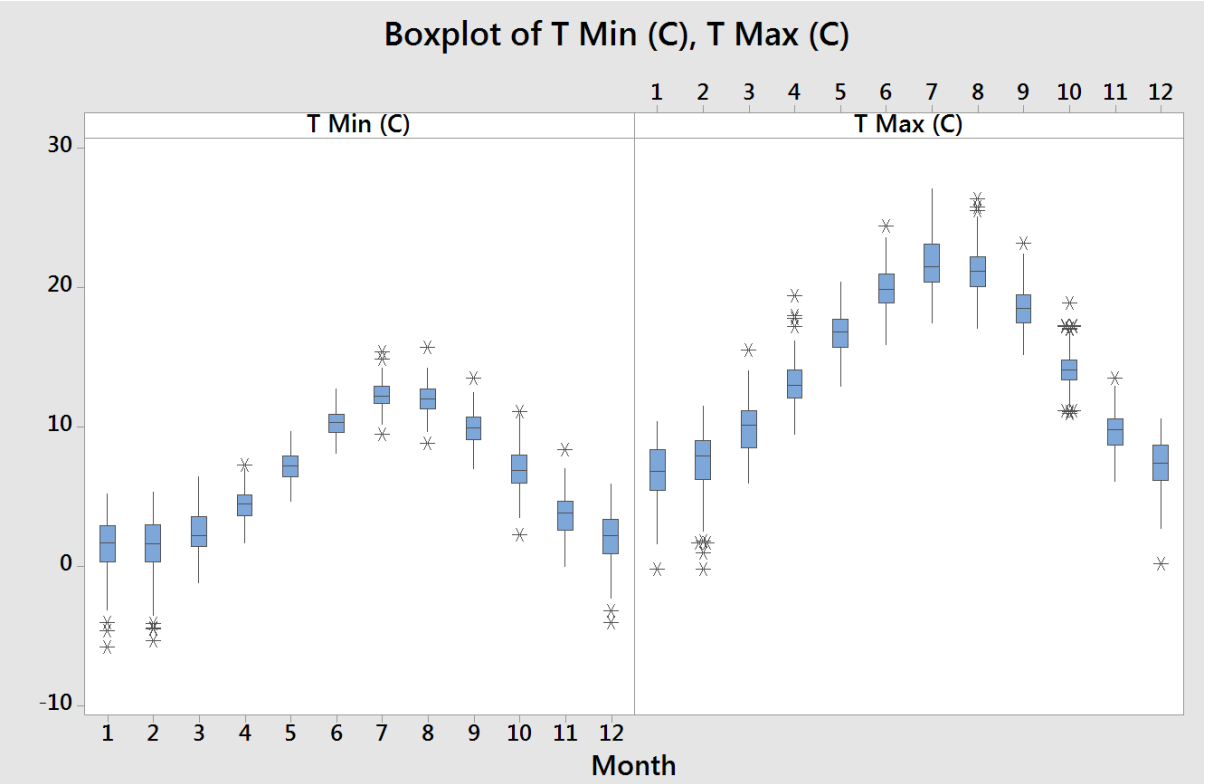
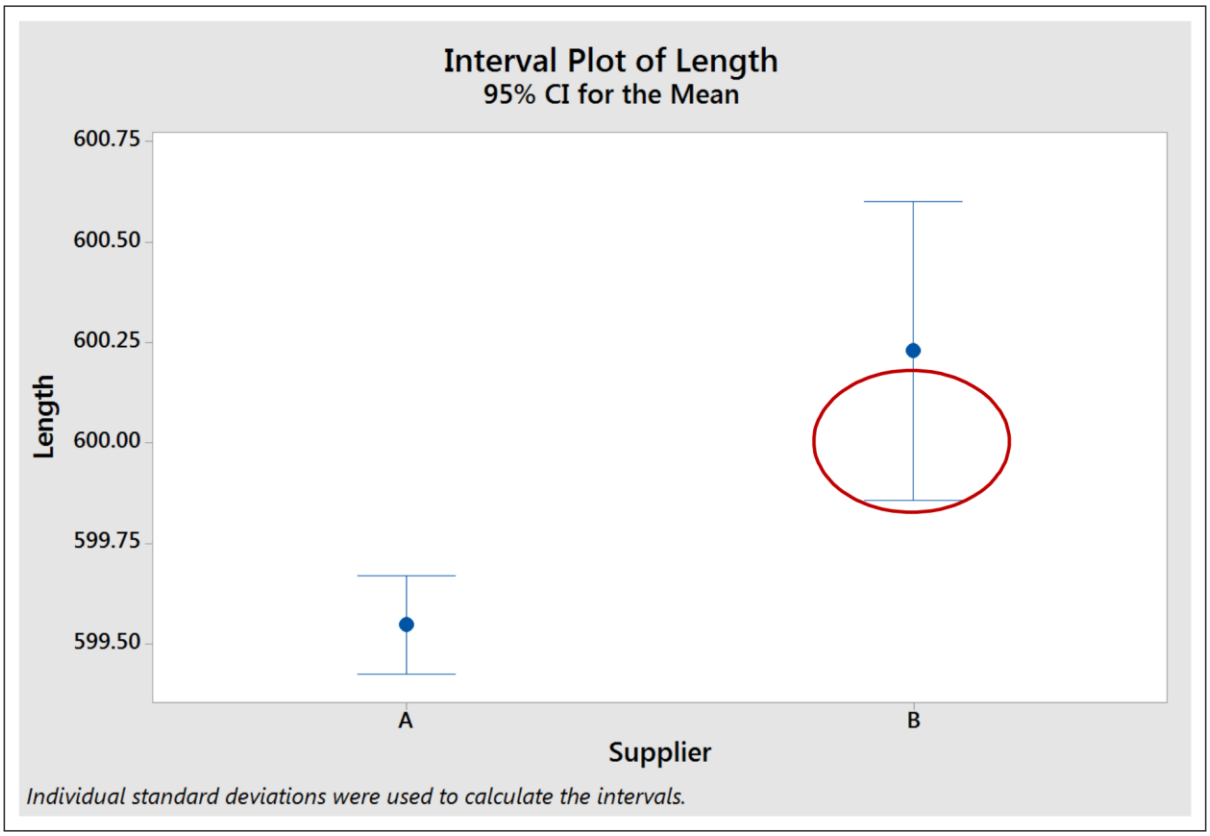


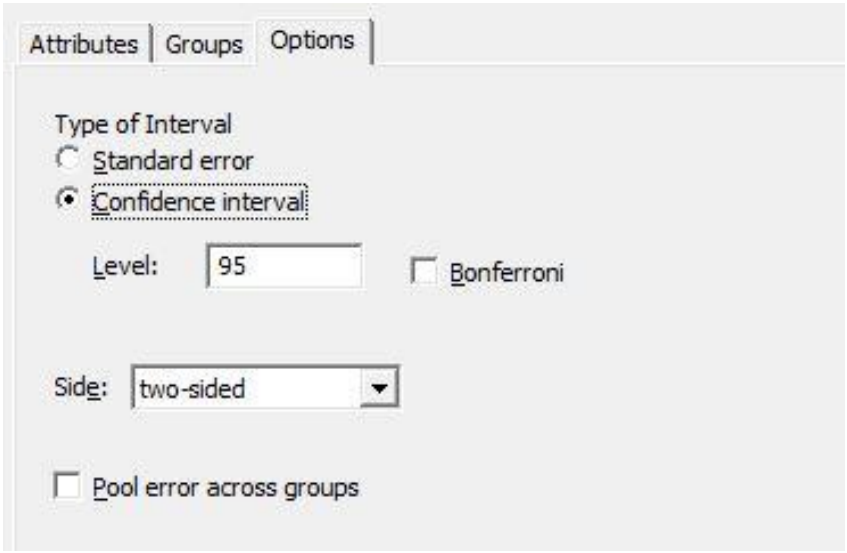
Chart of Mean(Pulse1, Pulse2)
Data
90
80
70
60
50
40
30
20
10
0
Pulse1
Pulse2
Pulse1
Pulse2
Ran
1
2

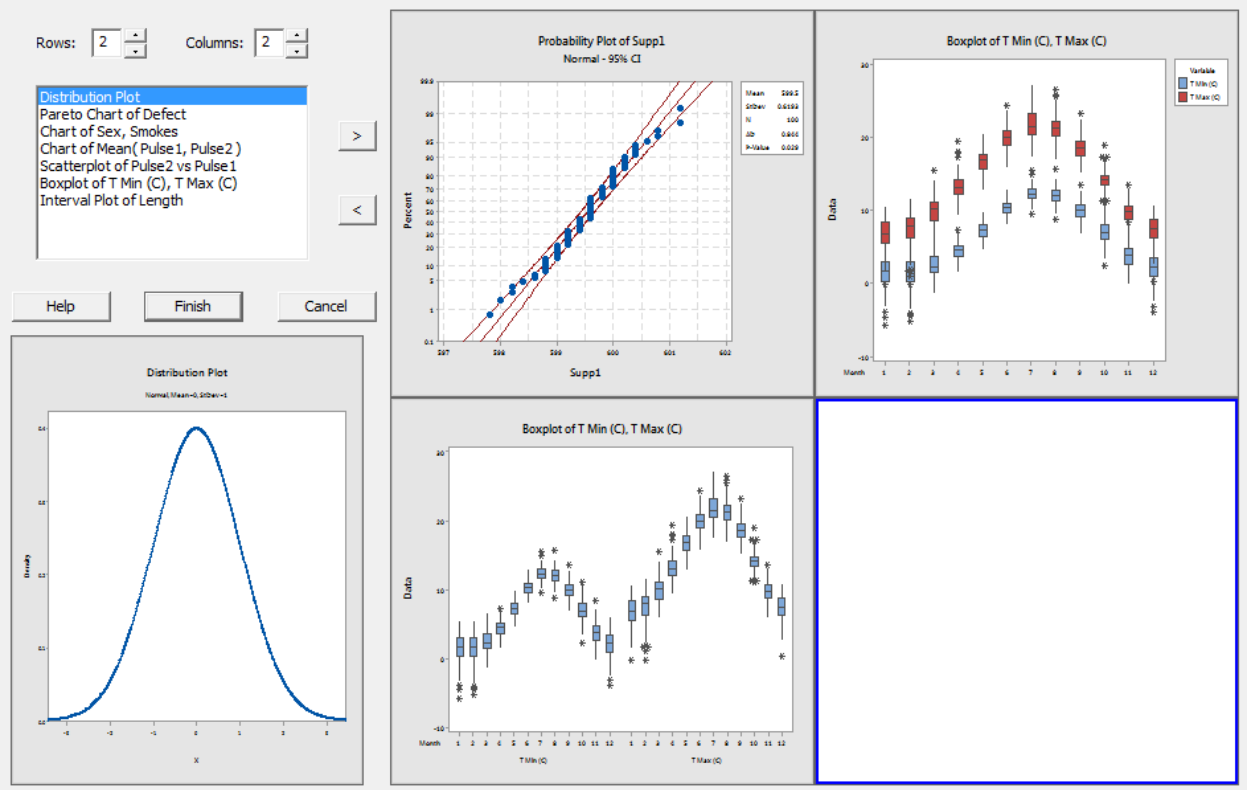

Scatterplot of Pulse2 vs Pulse1
Pulse2
140
130
120
110
100
90
80
70
60
50
50
60
70
80
90
100
Pulse1
Ran
1
2

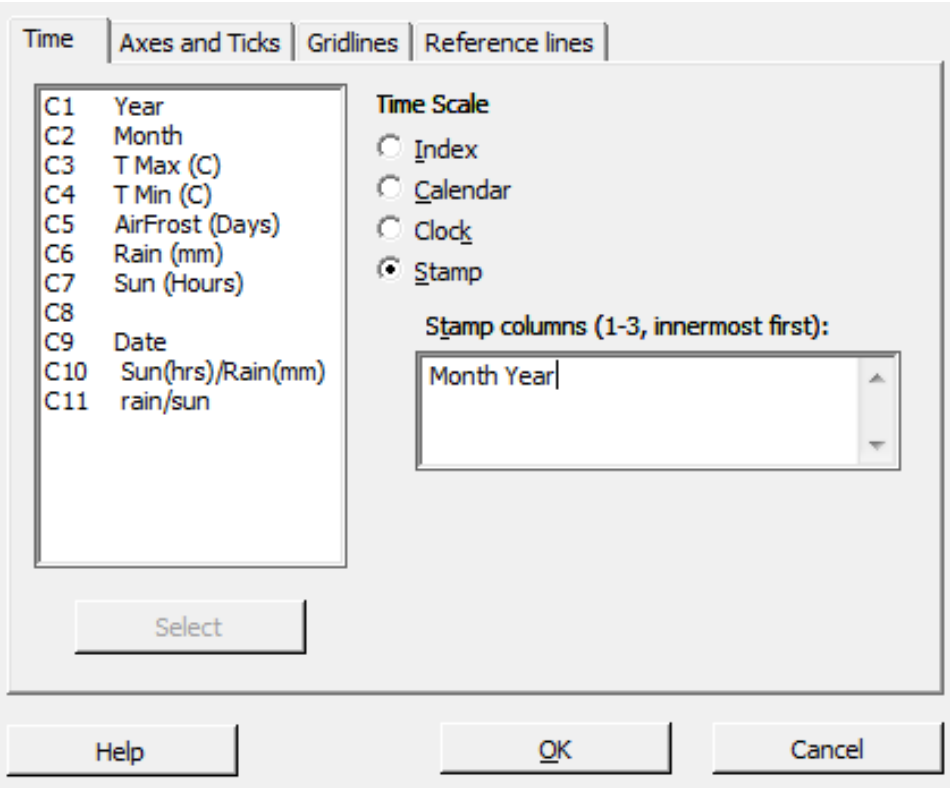

Scatterplot of Pulse2 vs Pulse1
Brushing
Row Sex Smokes Activity
12 1 2 2
27 2 1 2
28 2 2 2
Ran
1
2
Pulse2
Pulse1
140
130
120
110
100
90
80
70
60
50
50
60
70
80
90
100

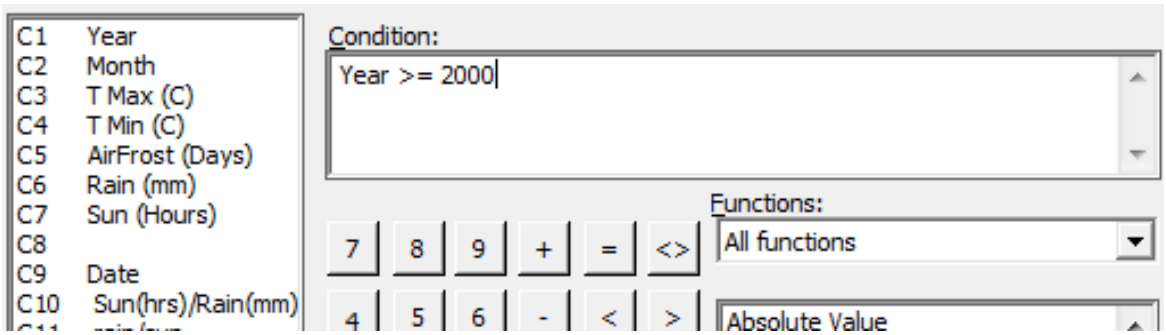

Boxplot of T Min (C), T Max (C)
T Min (C)
T Max (C)
1 2 3 4 5 6 7 8 9 10 11 12
30
20
10
0
-10
Month

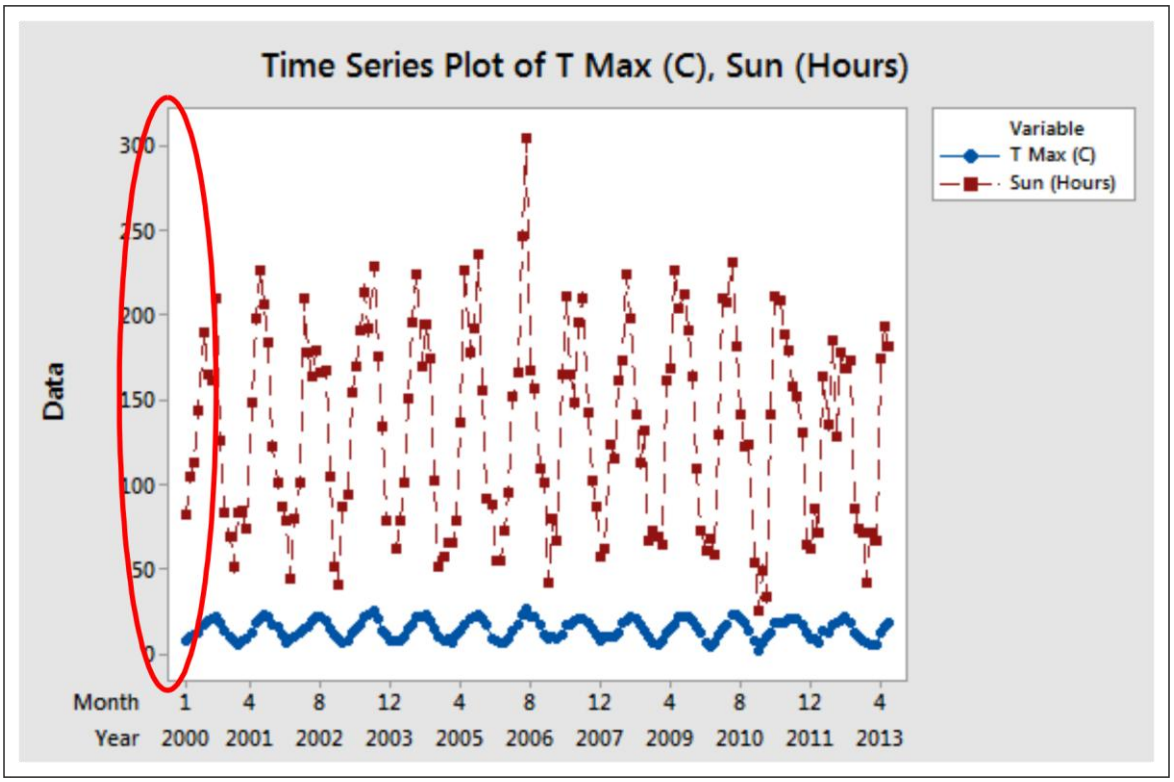

Interval Plot of Length
95% CI for the Mean
600.75
600.50
600.25
600.00
599.75
599.50
Length
A
B
Supplier
Individual standard deviations were used to calculate the intervals.

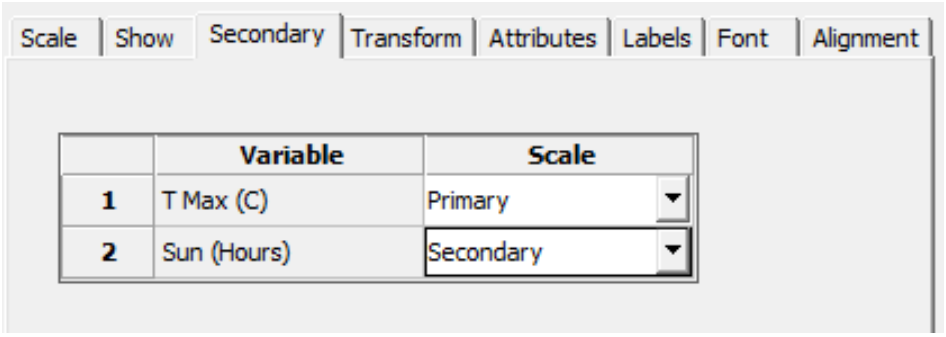

Attributes
Groups
Options
Type of Interval
Standard error
Confidence interval
Level:
95
Bonferroni
Side:
two-sided
Pool error across groups


Rows: 2
Columns: 2
Distribution Plot
Pareto Chart of Defect
Chart of Sex, Smokes
Chart of Mean(Pulse1, Pulse2)
Scatterplot of Pulse2 vs Pulse1
Boxplot of T Min (C), T Max (C)
Interval Plot of Length
>
<
Help
Finish
Cancel
Probability Plot of Supp1
Normal - 95% CI
Percent
Supp1
Boxplot of T Min (C), T Max (C)
Variable
T Min (C)
T Max (C)
Data
Month
Distribution Plot
Density
X
Boxplot of T Min (C), T Max (C)
Data
Month
T Min (C)
T Max (C)

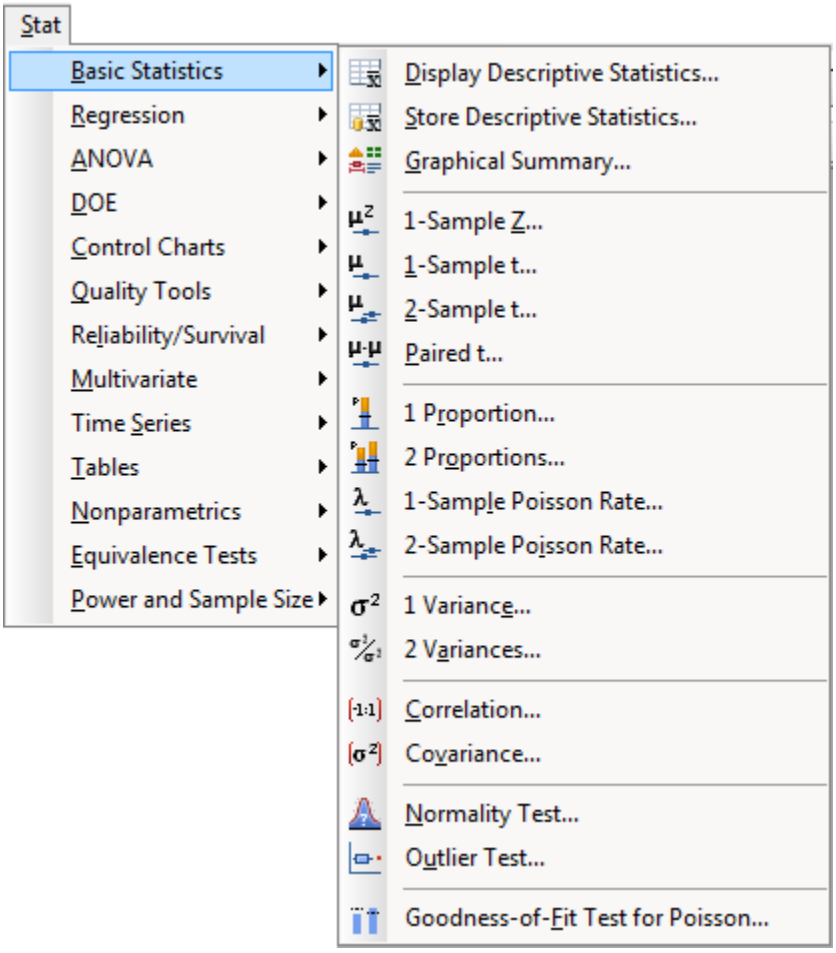

Time
Axes and Ticks
Gridlines
Reference lines
C1 Year
C2 Month
C3 T Max (C)
C4 T Min (C)
C5 AirFrost (Days)
C6 Rain (mm)
C7 Sun (Hours)
C8
C9 Date
C10 Sun(hrs)/Rain(mm)
C11 rain/sun
Time Scale
Index
Calendar
Clock
Stamp
Stamp columns (1-3, innermost first):
Month Year
Select
Help
OK
Cancel


C1 Year
C2 Month
C3 T Max (C)
C4 T Min (C)
C5 AirFrost (Days)
C6 Rain (mm)
C7 Sun (Hours)
C8
C9 Date
C10 Sun(hrs)/Rain(mm)
Condition:
Year >= 2000
Functions:
7 8 9 + = <>
4 5 6 - < >
All functions
Absolute Value

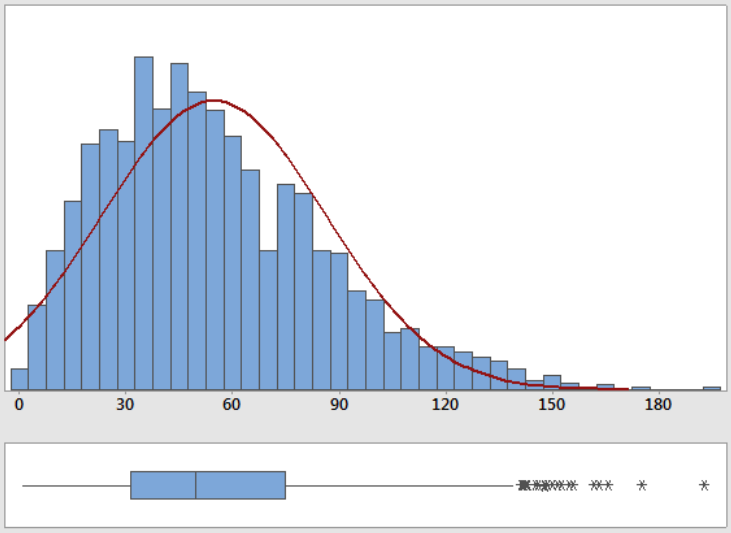

Time Series Plot of T Max (C), Sun (Hours)
Variable
T Max (C)
Sun (Hours)
Data
300
250
200
150
100
50
0
Month 1 4 8 12 4 8 12 4 8 12 4
Year 2000 2001 2002 2003 2005 2006 2007 2009 2010 2011 2013


Scale
Show
Secondary
Transform
Attributes
Labels
Font
Alignment
Variable
Scale
1
T Max (C)
Primary
2
Sun (Hours)
Secondary

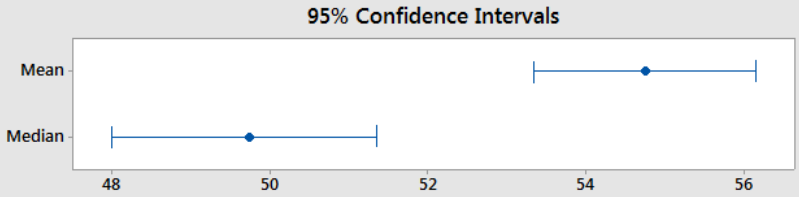
Chapter 3, Basic Statistical Tools



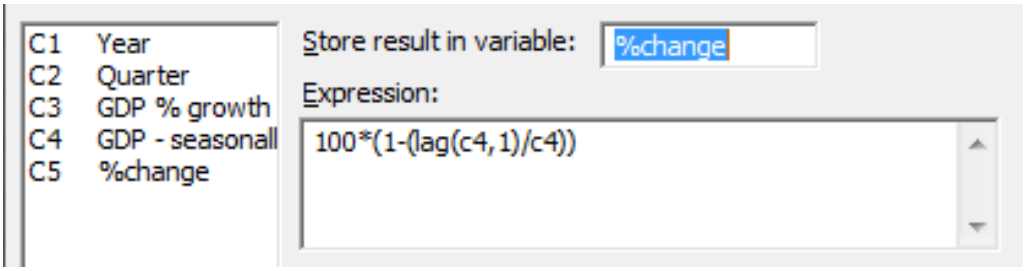
Summary Report for Rain (mm)

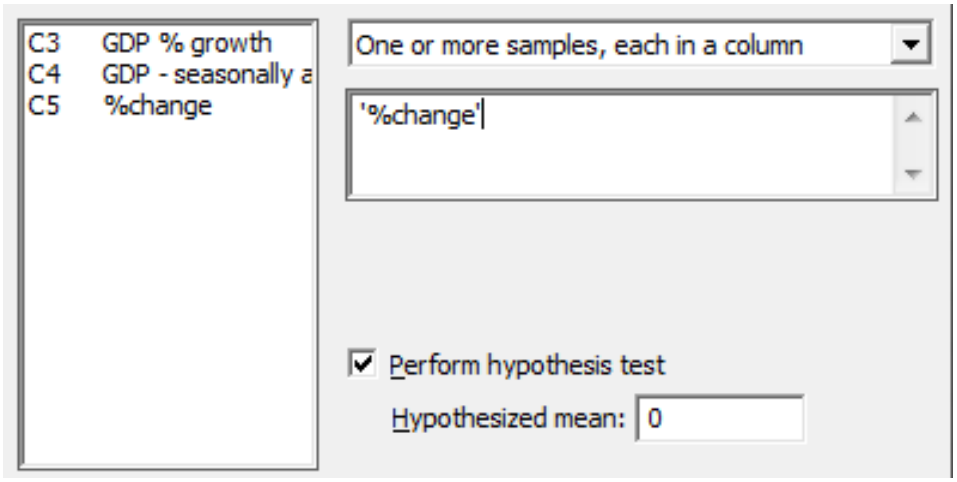


Anderson-Darling Normality Test	
A-Squared	18.20
P-Value	<0.005
Mean	54.743
StDev	31.441
Variance	988.521
Skewness	0.757477
Kurtosis	0.361225
N	1926
Minimum	0.500
1st Quartile	31.275
Median	49.750
3rd Quartile	74.825
Maximum	192.900
95% Confidence Interval for Mean	
53.338	56.148
95% Confidence Interval for Median	
48.000	51.350
95% Confidence Interval for StDev	
30.478	32.466



C1-T	C2-T	C3	C4
Year	Quarter	GDP % growth	GDP - seasonally adjusted
2009	Q2	-0.2	349261
2009	Q3	0.4	350643
2009	Q4	0.4	352091
2010	Q1	0.6	354177
2010	Q2	0.7	356701
2010	Q3	0.6	358885
2010	Q4	-0.4	357324
2011	Q1	0.5	359114
2011	Q2	0.1	359405
2011	Q3	0.6	361599
2011	Q4	-0.1	361130
2012	Q1	-0.1	360880
2012	Q2	-0.4	359538
2012	Q3	0.9	362914
2012	Q4	-0.3	361846
2013	Q1	0.3	362932





Specify values for any two of the following:

Sample sizes: 15

Differences:

Power values: 0.8 0.9

Standard deviation: 0.43

C1-T	C2-T	C3	C4
Year	Quarter	GDP % growth	GDP - seasonally adjusted
2009	Q2	-0.2	349261
2009	Q3	0.4	350643
2009	Q4	0.4	352091
2010	Q1	0.6	354177
2010	Q2	0.7	356701
2010	Q3	0.6	358885
2010	Q4	-0.4	357324
2011	Q1	0.5	359114
2011	Q2	0.1	359405
2011	Q3	0.6	361599
2011	Q4	-0.1	361130
2012	Q1	-0.1	360880
2012	Q2	-0.4	359538
2012	Q3	0.9	362914
2012	Q4	-0.3	361846
2013	Q1	0.3	362932

Specify values for any two of the following:

Sample sizes:

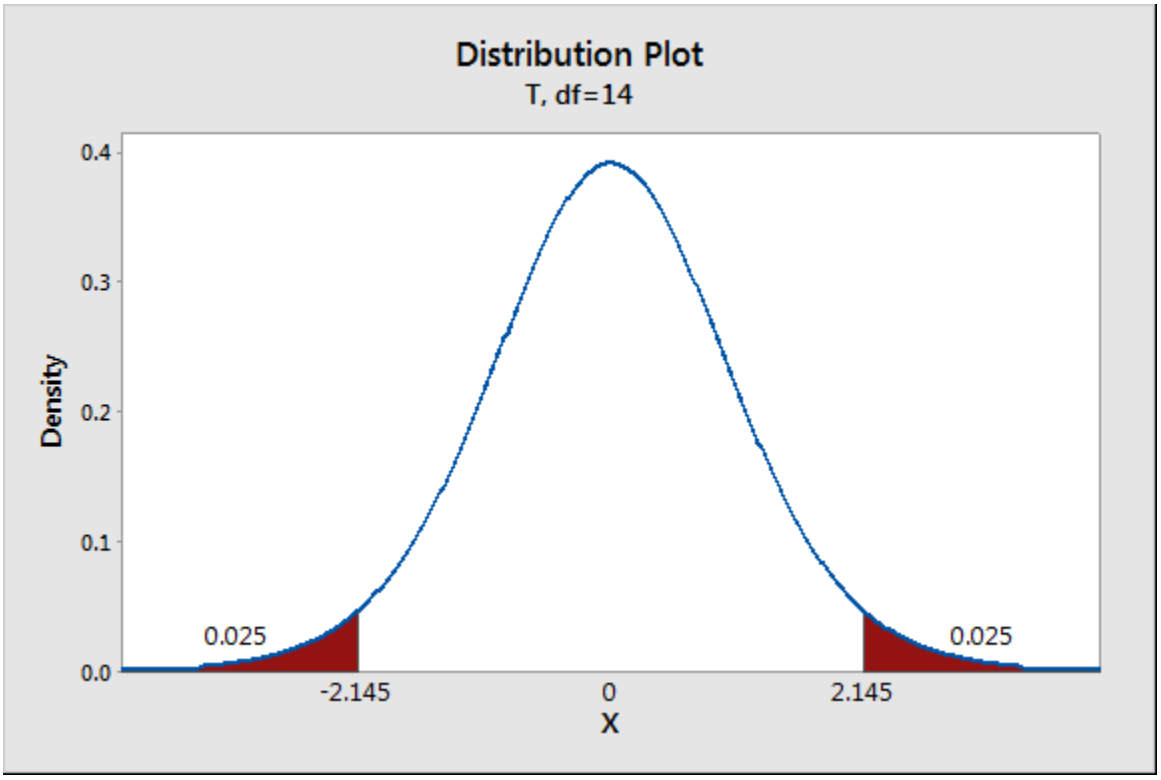
Differences: 1 2 3

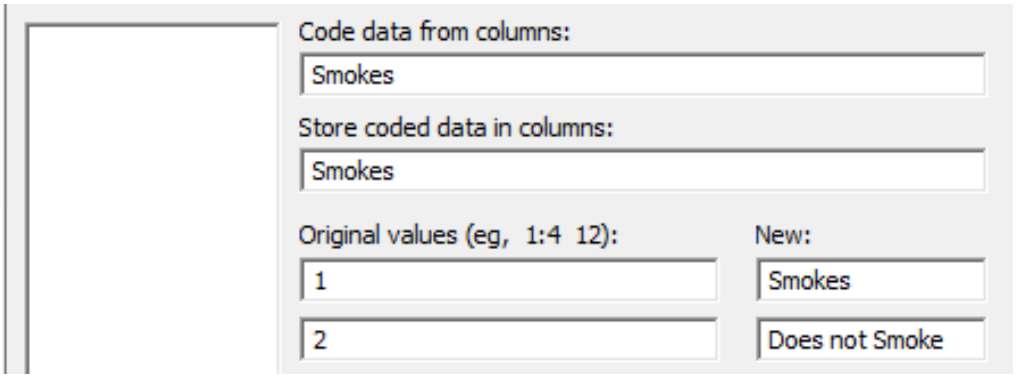
Power values: .8 .9

Standard deviation: 1

Difference	Sample Size	Target Power	Actual Power
1	17	0.8	0.807037
1	23	0.9	0.912498
2	6	0.8	0.876418
2	7	0.9	0.929070
3	4	0.8	0.938936
3	4	0.9	0.938936

The sample size is for each group.





Event = 2

Sex	X	N	Sample p
1	37	57	0.649123
2	27	35	0.771429

Difference = p (1) - p (2)
Estimate for difference: -0.122306
95% CI for difference: (-0.308592, 0.0639809)
Test for difference = 0 (vs not = 0): Z = -1.29 P-Value = 0.198

Enter your own sample names or use the defaults. Type in the data for the two samples.

Sample Name	Total Number Tested	Number of Defectives
After	150	6
Before	200	21

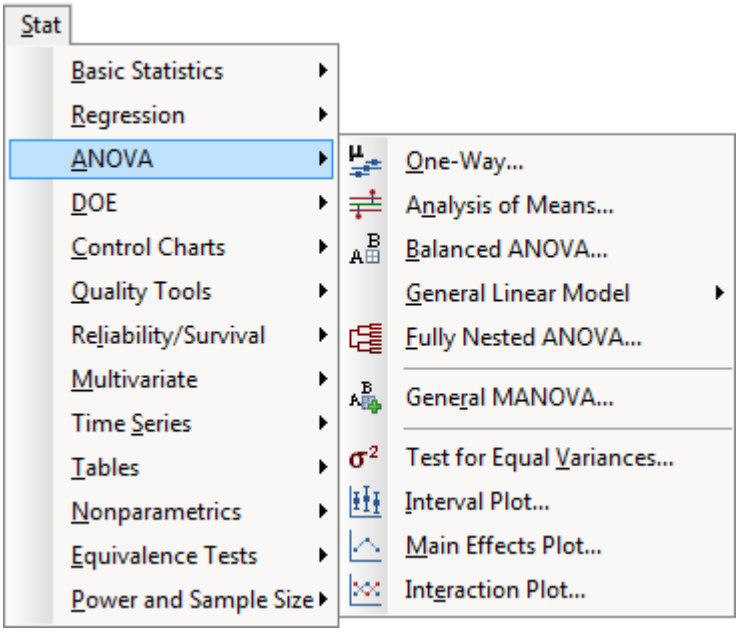
Test setup

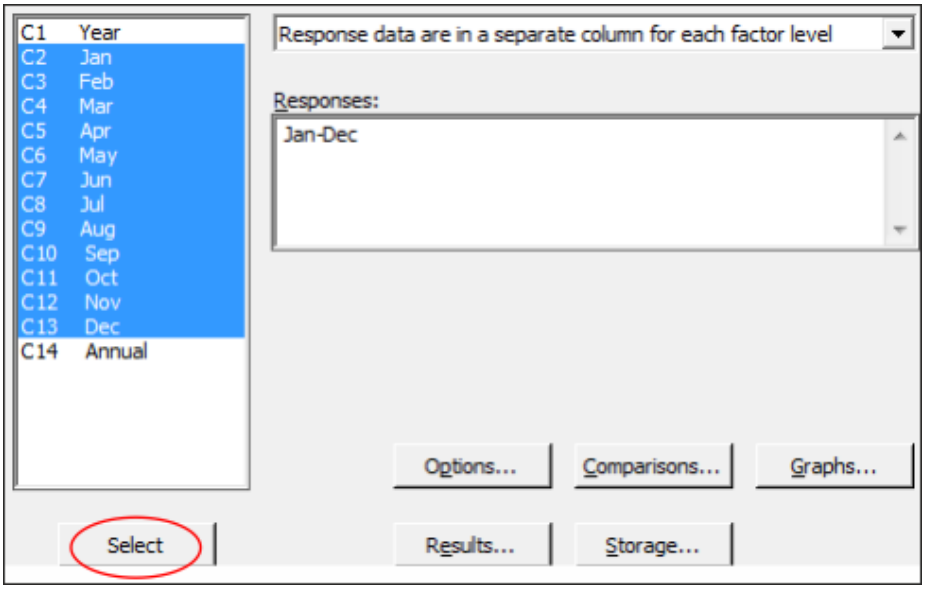
What do you want to determine?

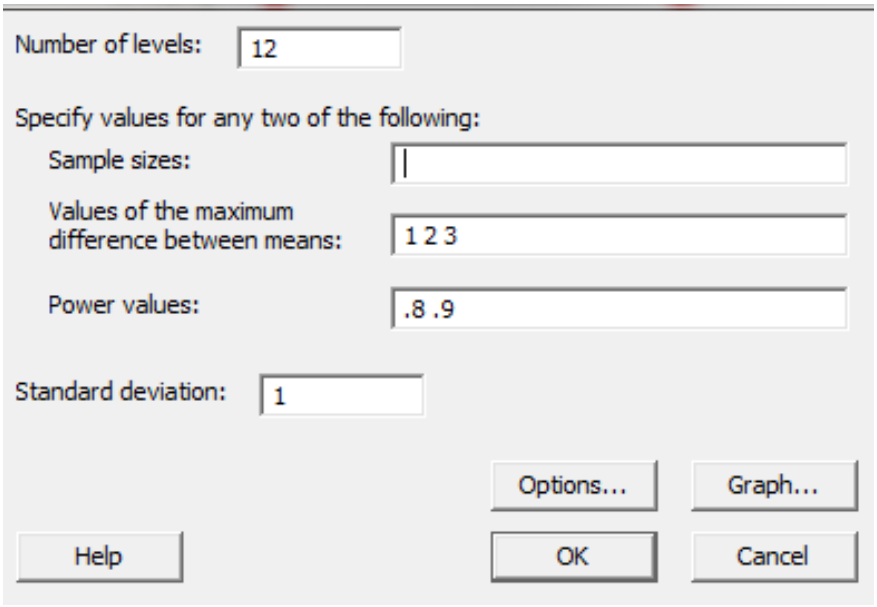
- ○ Is the % defective of After greater than the % defective of Before?
- ◉ Is the % defective of After less than the % defective of Before?
- ○ Is the % defective of After different from the % defective of Before?

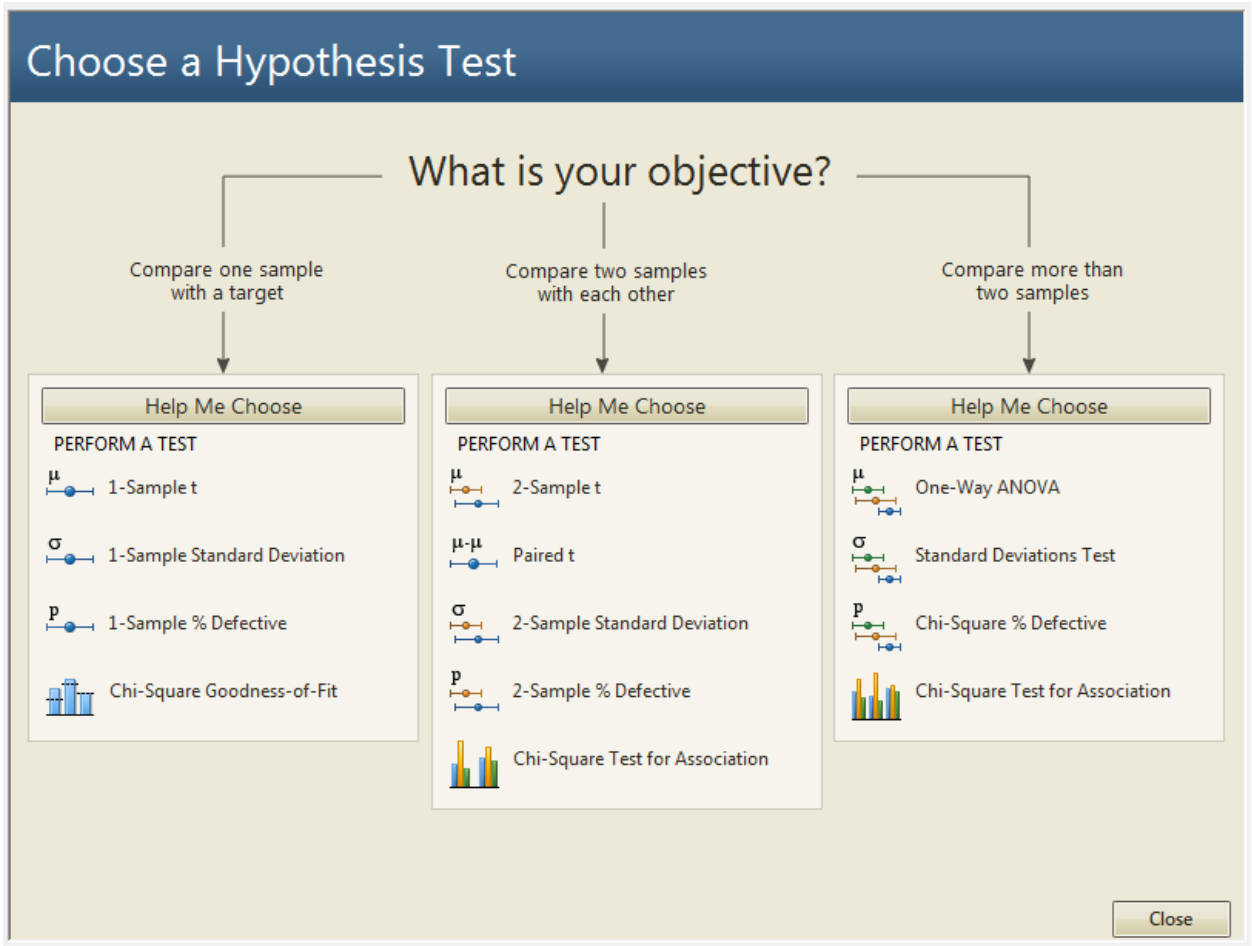
Enlisted	Service	Gender
392392	Army	Male
234002	Navy	Male
167164	Marine Corps	Male
206734	Air Force	Male
29374	Coast Guard	Male
59672	Army	Female
41294	Navy	Female
11049	Marine Corps	Female
51361	Air Force	Female
3854	Coast Guard	Female

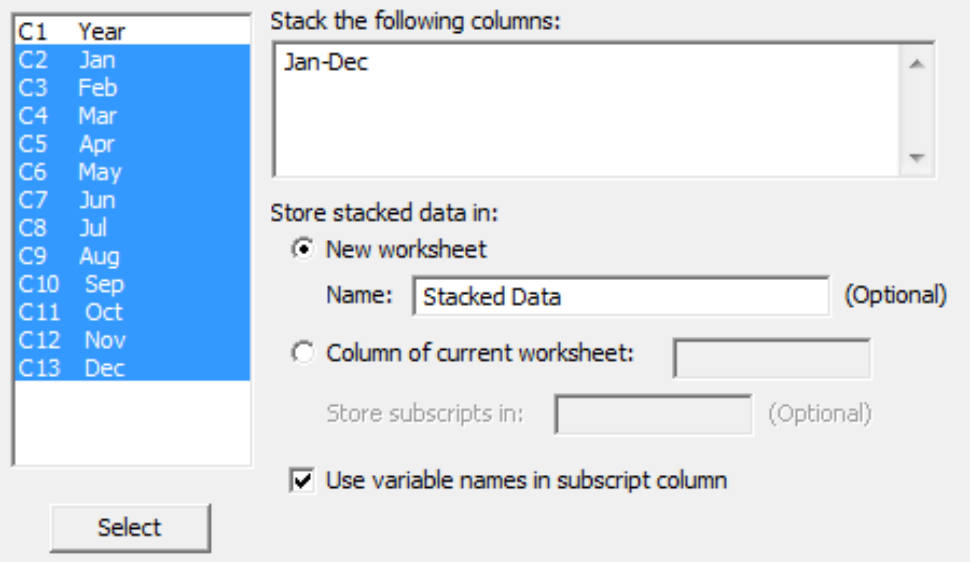
Chapter 4, Using Analysis of Variance

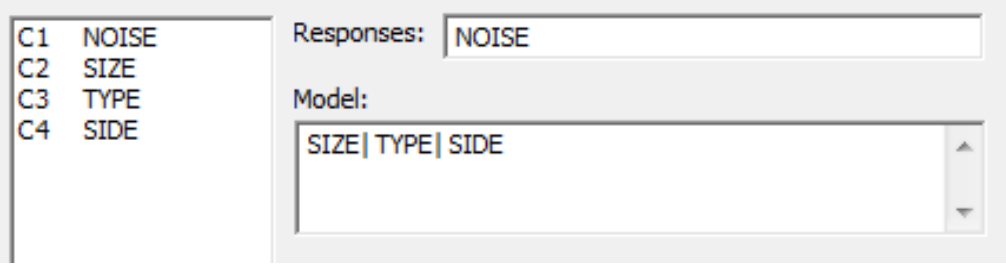




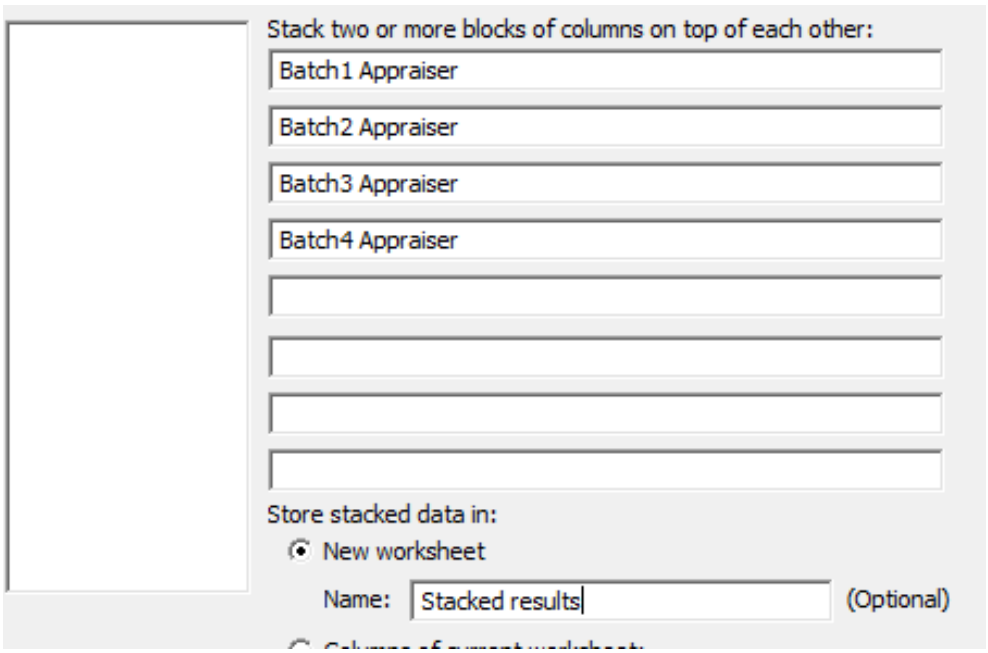

Number of levels: 12
Specify values for any two of the following:
Sample sizes:
Values of the maximum difference between means: 1 2 3
Power values: .8 .9
Standard deviation: 1
Options...
Graph...
Help
OK
Cancel

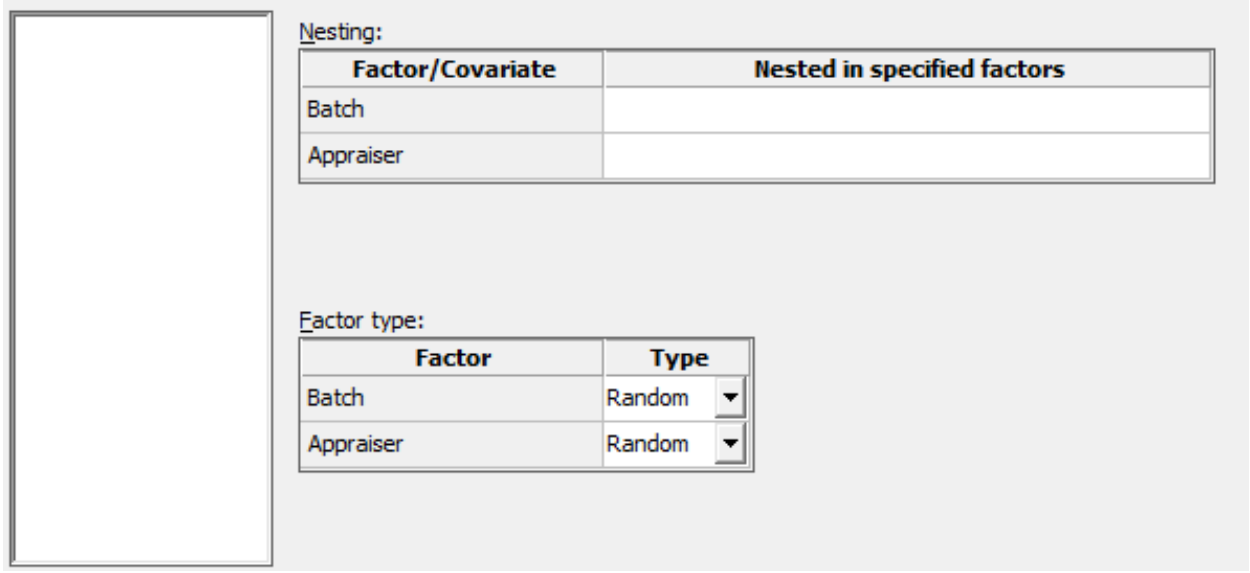

Choose a Hypothesis Test
What is your objective?
Compare one sample with a target
Compare two samples with each other
Compare more than two samples
Help Me Choose
PERFORM A TEST
1-Sample t
1-Sample Standard Deviation
1-Sample % Defective
Chi-Square Goodness-of-Fit
Help Me Choose
PERFORM A TEST
2-Sample t
Paired t
2-Sample Standard Deviation
2-Sample % Defective
Chi-Square Test for Association
Help Me Choose
PERFORM A TEST
One-Way ANOVA
Standard Deviations Test
Chi-Square % Defective
Chi-Square Test for Association
Close

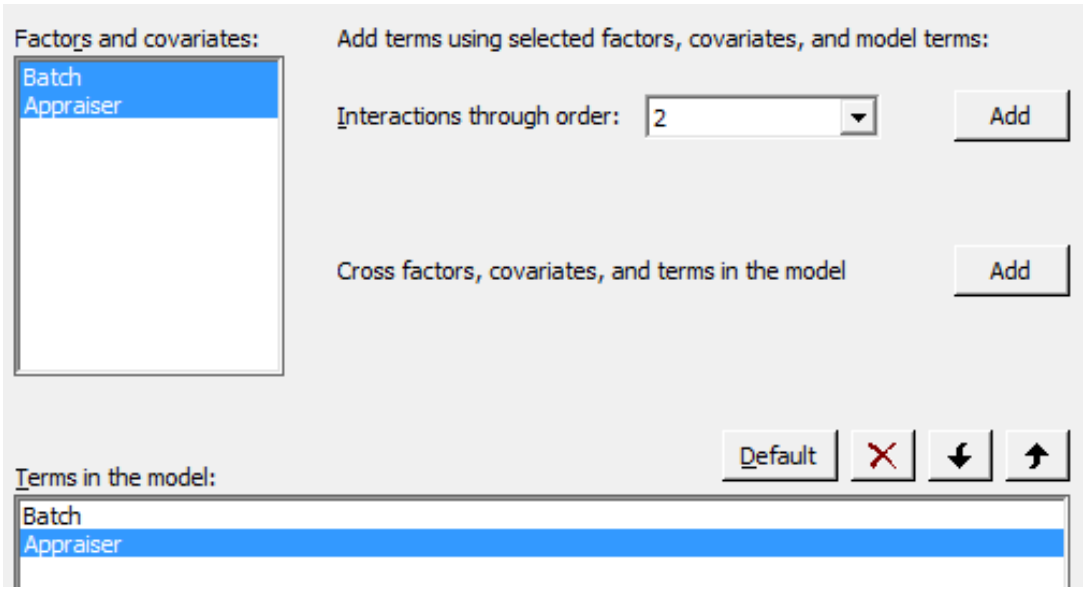




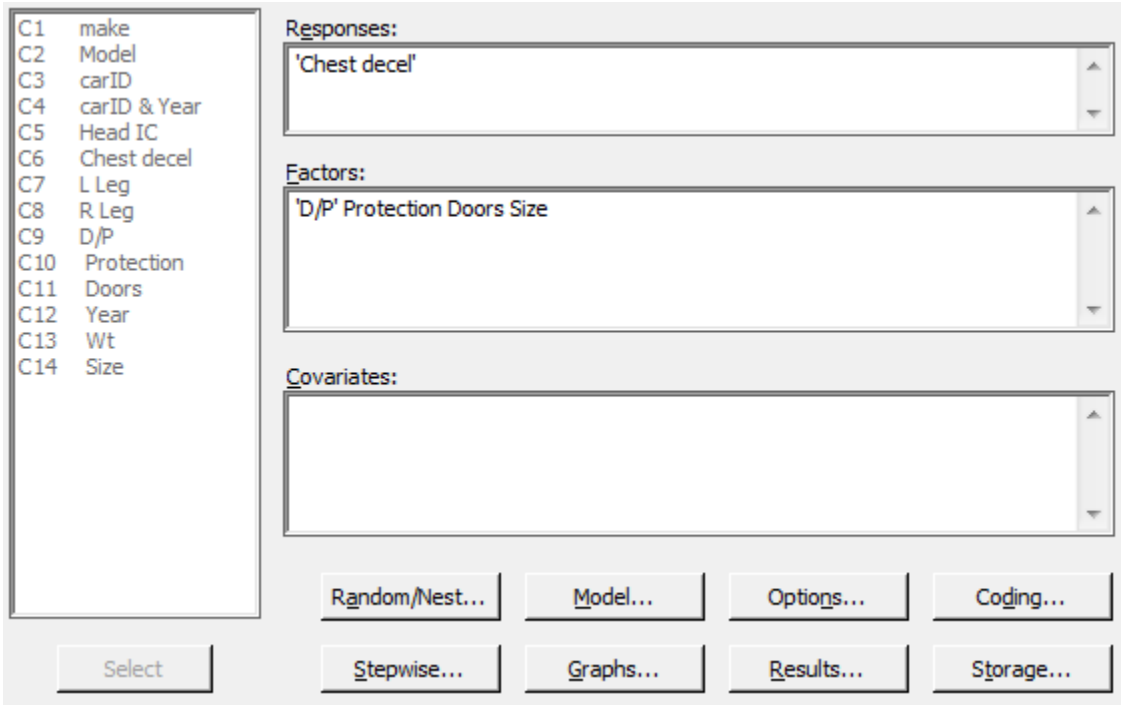
Appraiser	Batch1	Batch2	Batch3	Batch4
A	7.75	7.25	8.75	7.50
A	7.50	7.25	8.50	7.50
B	8.00	7.50	8.00	6.75
B	7.50	6.75	8.25	7.00
C	7.25	7.00	8.50	7.25
C	7.00	7.50	8.25	7.00
D	7.50	6.25	8.00	6.75
D	7.75	6.50	8.50	7.00

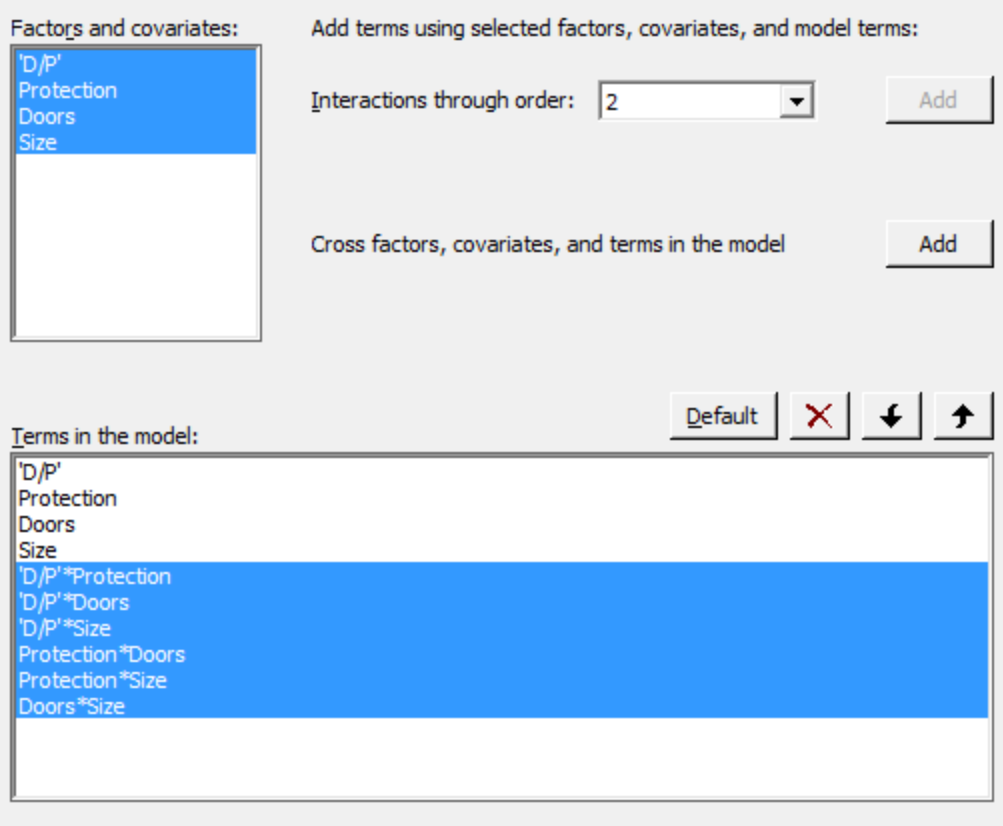

Stack two or more blocks of columns on top of each other:
Batch1 Appraiser
Batch2 Appraiser
Batch3 Appraiser
Batch4 Appraiser
Store stacked data in:
New worksheet
Name: Stacked results
(Optional)


Nesting:
Factor/Covariate
Nested in specified factors
Batch
Appraiser
Factor type:
Factor
Type
Batch
Random
Appraiser
Random



$$F = MS_{batch} / MS_{Batch*Appraiser}$$



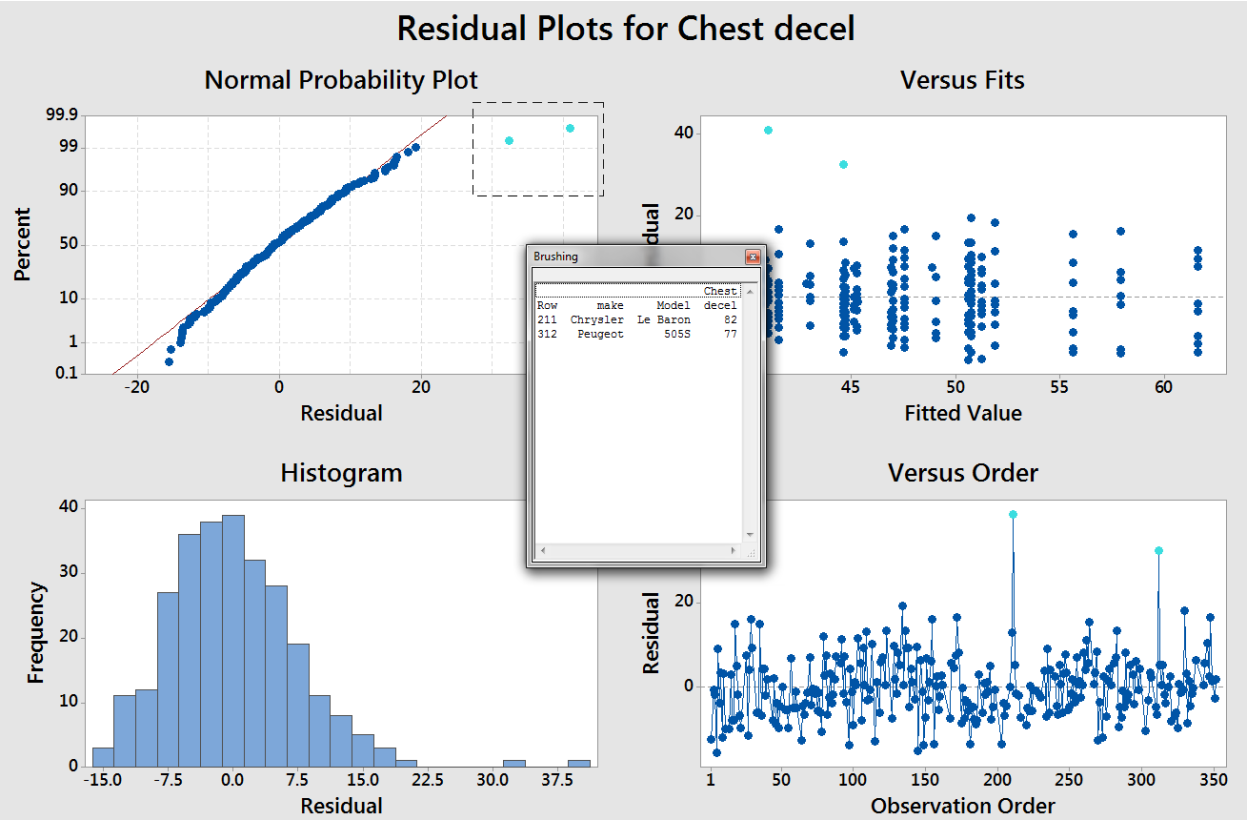


Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
D/P	1	458.1	458.06	7.67	0.006
Protection	4	538.3	134.57	2.25	0.064
Doors	1	659.6	659.60	11.04	0.001
Size	5	3243.9	648.79	10.86	0.000
D/P*Protection	4	96.6	24.15	0.40	0.806
D/P*Doors	1	130.2	130.15	2.18	0.141
D/P*Size	5	95.5	19.10	0.32	0.901
Doors*Size	5	203.0	40.60	0.68	0.639
Error	248	14818.2	59.75		
Lack-of-Fit	35	2234.6	63.85	1.08	0.358
Pure Error	213	12583.6	59.08		
Total	274	22757.9			

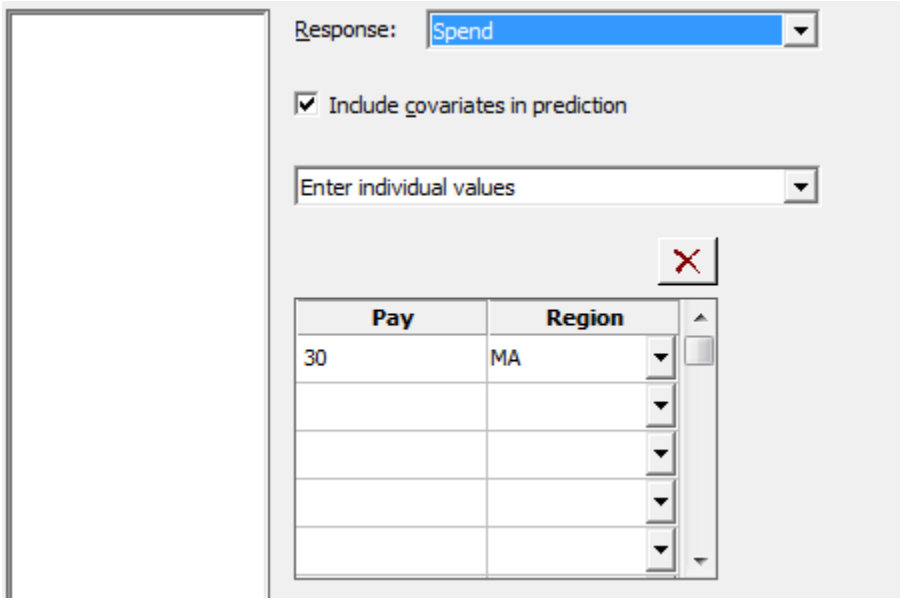
Analysis of Variance

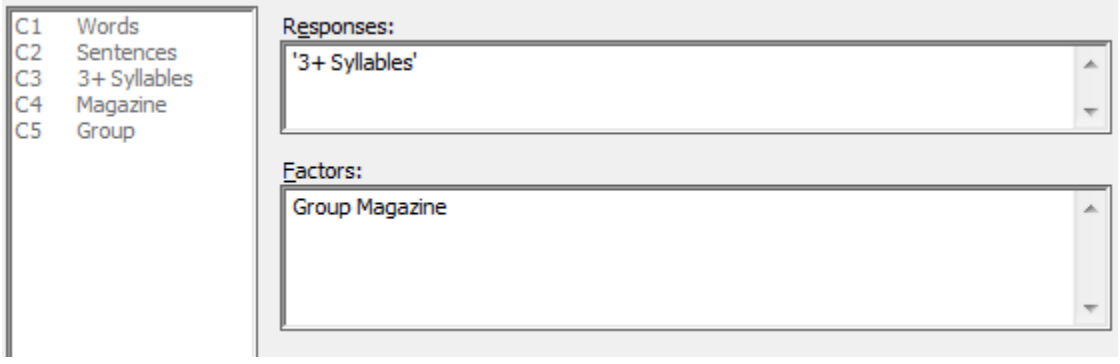
Source	DF	Adj SS	Adj MS	F-Value	P-Value
D/P	1	2487.4	2487.37	41.94	0.000
Doors	1	851.0	851.00	14.35	0.000
Size	5	3600.6	720.11	12.14	0.000
Error	267	15836.9	59.31		
Lack-of-Fit	54	3253.3	60.25	1.02	0.447
Pure Error	213	12583.6	59.08		
Total	274	22757.9			



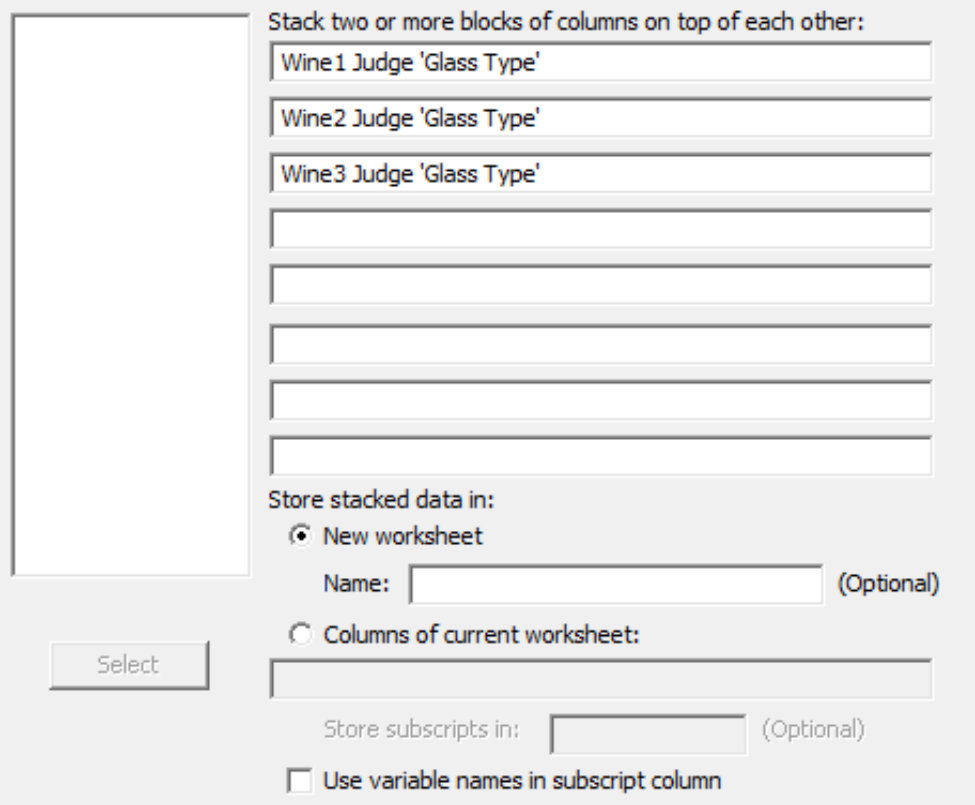
Analysis of Variance

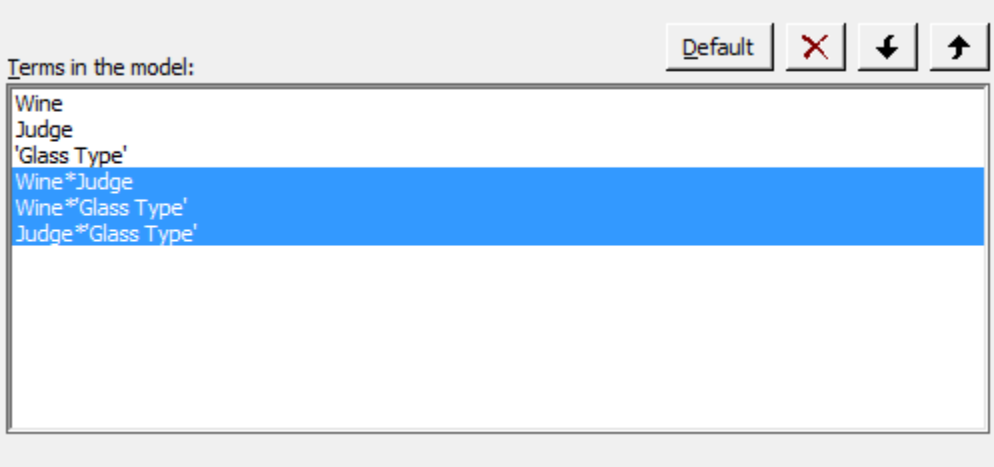
Source	DF	Adj SS	Adj MS	F-Value	P-Value
Pay	1	6.8875	6.88753	24.09	0.000
Region	8	3.0162	0.37702	1.32	0.269
Pay*Region	8	3.1138	0.38922	1.36	0.249
Error	33	9.4356	0.28593		
Lack-of-Fit	31	9.2775	0.29927	3.79	0.230
Pure Error	2	0.1581	0.07903		
Total	50	55.6447			

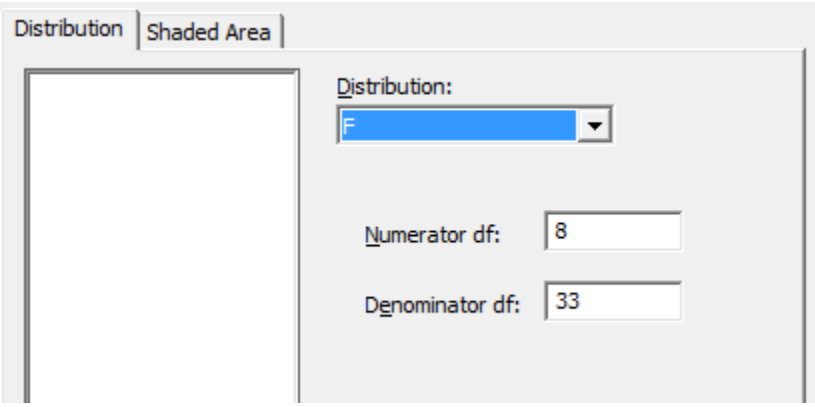


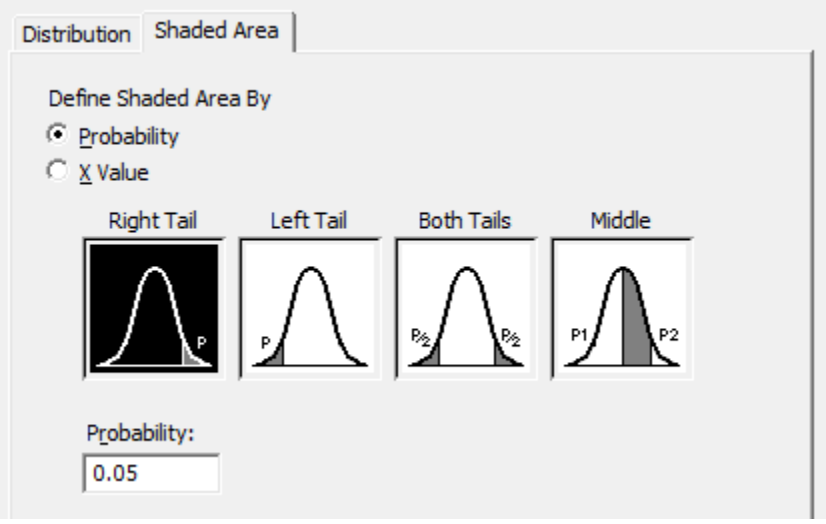


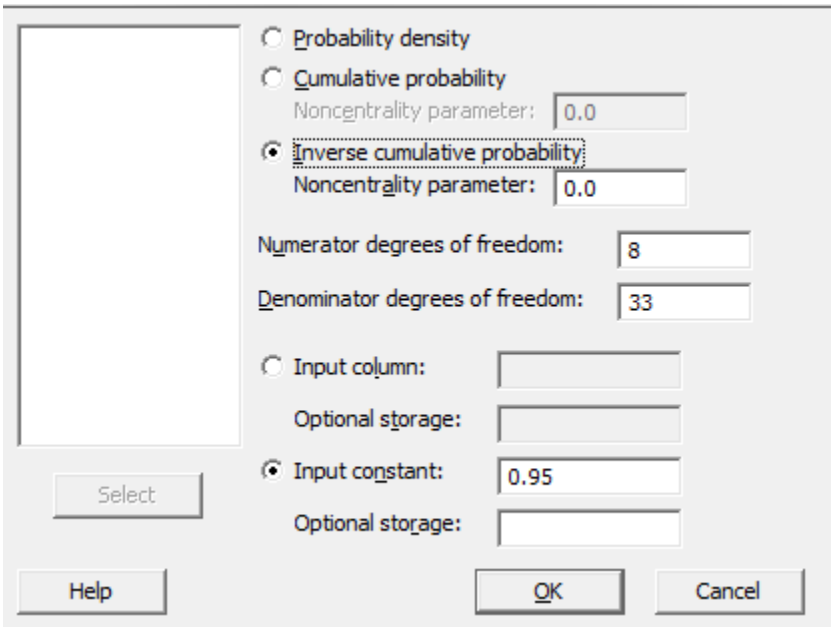
Judge	Wine1	Wine2	Wine3	Glass Type
A	23	18	26	1
A	20	16	23	2
A	22	19	25	1
B	25	22	28	1
B	23	19	25	2
B	22	19	25	2
C	20	17	23	2
C	23	19	25	1
C	23	19	27	2



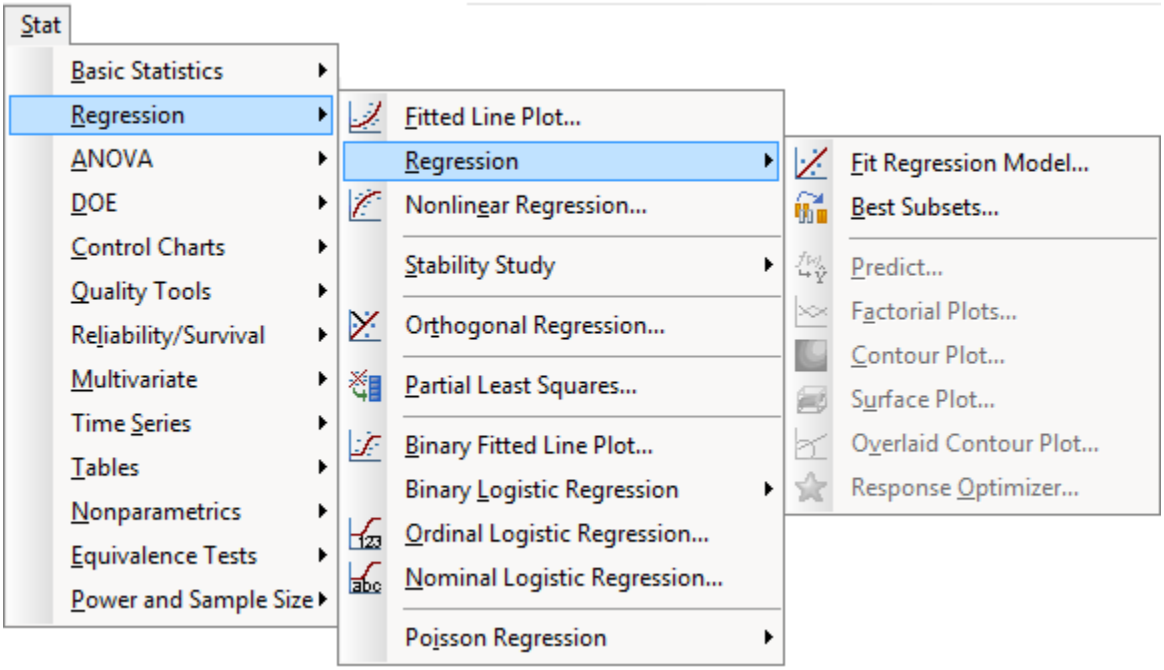

Default
Terms in the model:
Wine
Judge
'Glass Type'
Wine*Judge
Wine*'Glass Type'
Judge*'Glass Type'

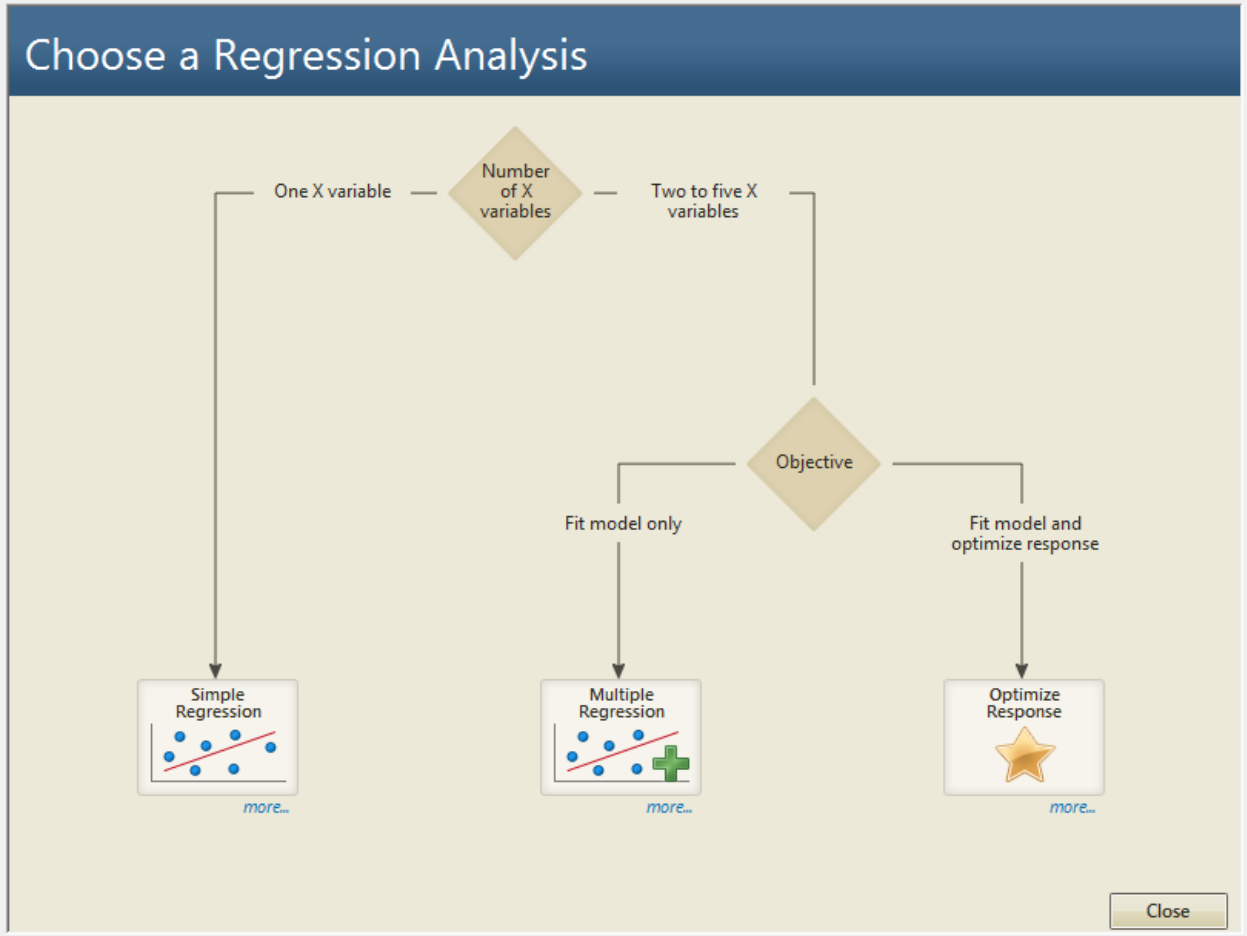

Distribution
Shaded Area
Distribution:
F
Numerator df:
8
Denominator df:
33


Distribution
Shaded Area
Define Shaded Area By
Probability
X Value
Right Tail
Left Tail
Both Tails
Middle
P
P
P/2
P/2
P1
P2
Probability:
0.05


Probability density
Cumulative probability
Noncentrality parameter: 0.0
Inverse cumulative probability
Noncentrality parameter: 0.0
Numerator degrees of freedom: 8
Denominator degrees of freedom: 33
Input column:
Optional storage:
Input constant: 0.95
Optional storage:
Select
Help
OK
Cancel

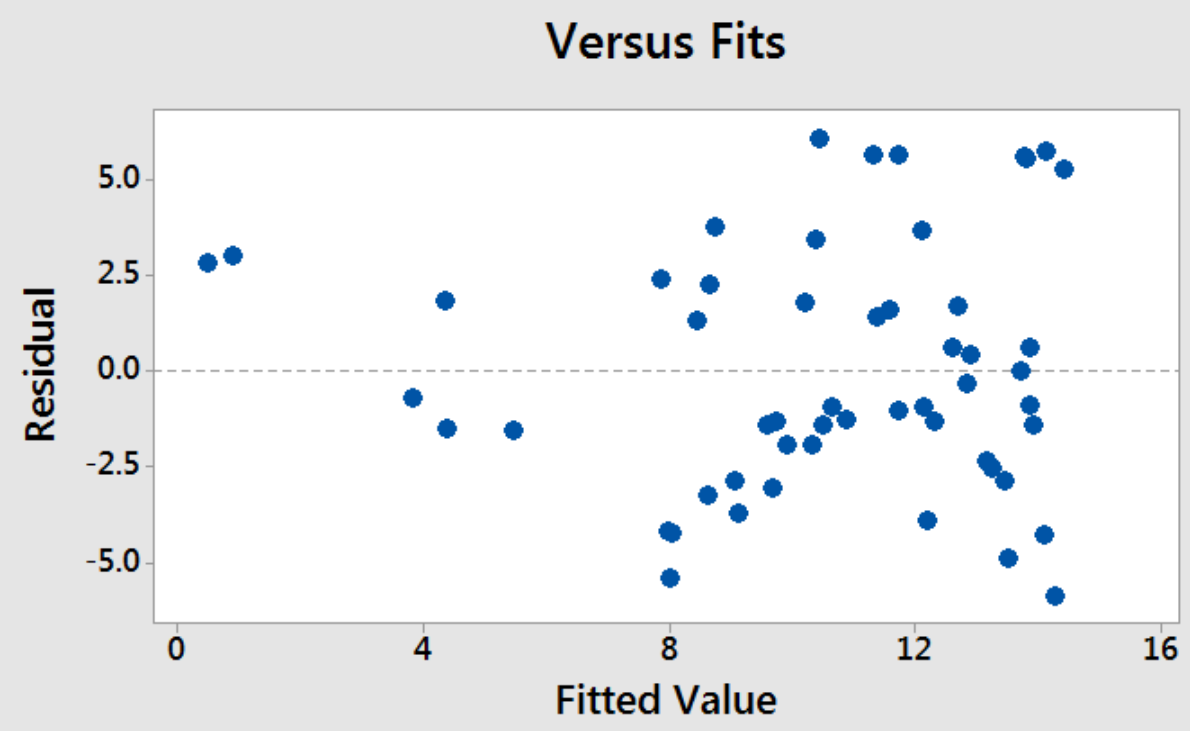
Chapter 5, Regression and Modeling the Relationship between X and Y

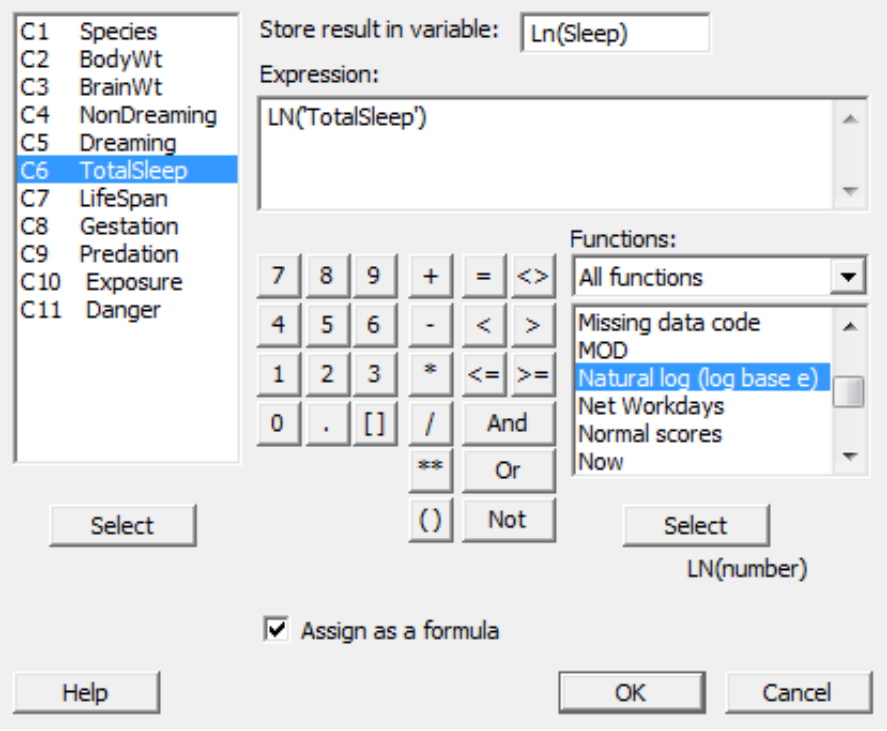


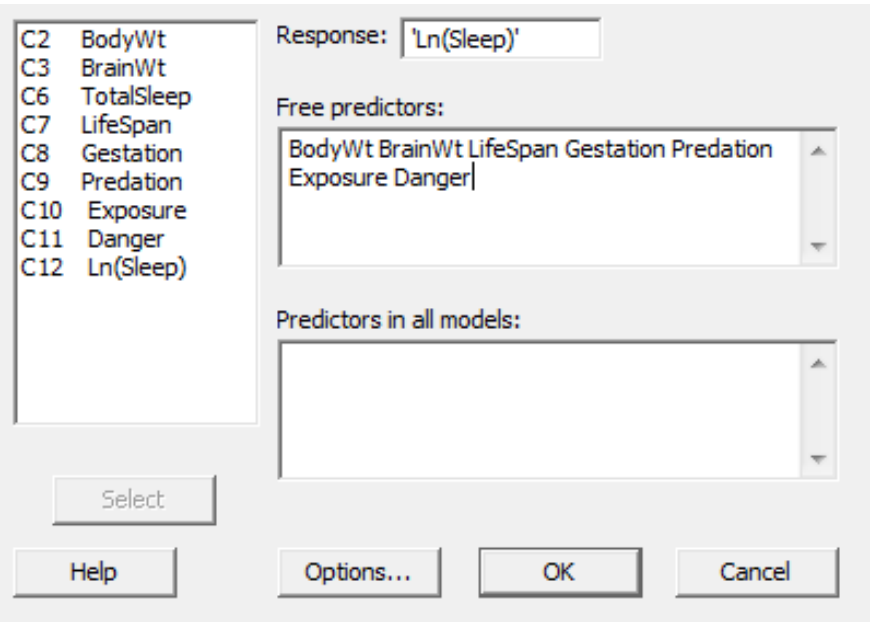


Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	16.60	1.08	15.40	0.000	
BodyWt	-0.00160	0.00146	-1.09	0.280	12.93
BrainWt	0.00232	0.00161	1.44	0.158	16.70
LifeSpan	-0.0398	0.0354	-1.13	0.266	2.80
Gestation	-0.01647	0.00621	-2.65	0.011	4.84
Predation	2.393	0.971	2.46	0.018	12.90
Exposure	0.633	0.559	1.13	0.263	4.80
Danger	-4.51	1.19	-3.80	0.000	17.71


Versus Fits
Residual
5.0
2.5
0.0
-2.5
-5.0
0
4
8
12
16
Fitted Value


C1 Species
C2 BodyWt
C3 BrainWt
C4 NonDreaming
C5 Dreaming
C6 TotalSleep
C7 LifeSpan
C8 Gestation
C9 Predation
C10 Exposure
C11 Danger
Store result in variable: Ln(Sleep)
Expression:
LN('TotalSleep')
Functions:
All functions
Missing data code
MOD
Natural log (log base e)
Net Workdays
Normal scores
Now
7 8 9 + = <>
4 5 6 - < >
1 2 3 * <= >=
0 . [] / And
** Or
() Not
Select
Select
LN(number)
Assign as a formula
Help
OK
Cancel

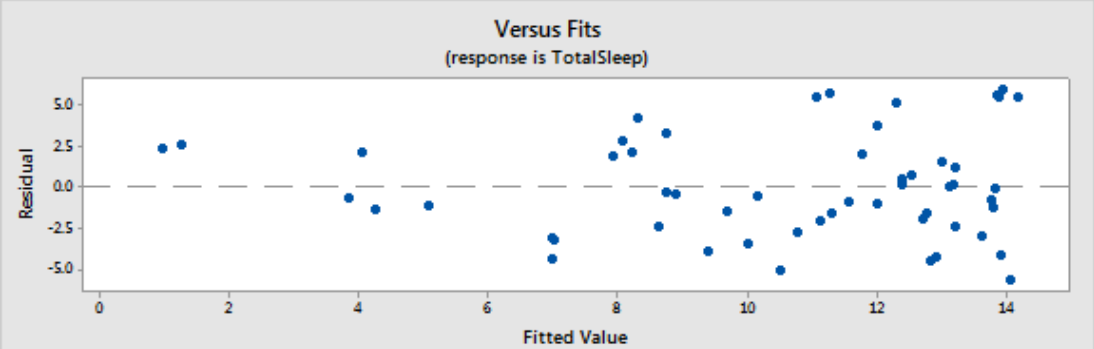


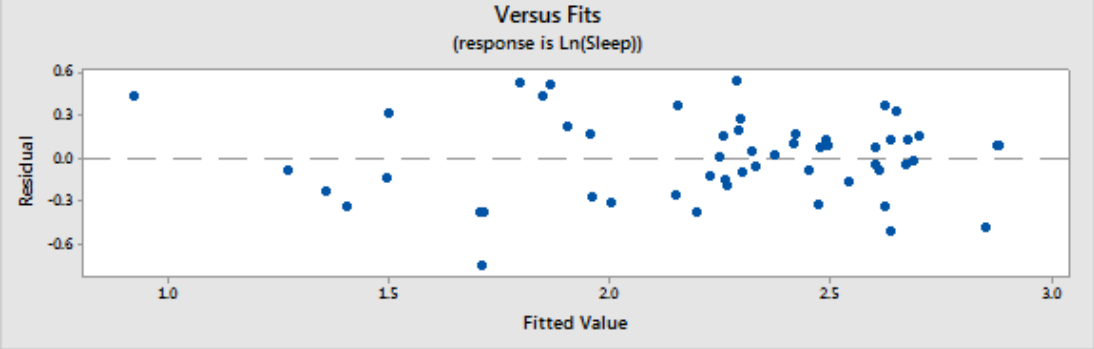
Analysis of Variance

Source	DF	Adj SS	Adj MS	F-Value	P-Value
Regression	3	10.5249	3.50829	40.23	0.000
Gestation	1	1.9890	1.98897	22.81	0.000
Predation	1	0.4688	0.46884	5.38	0.025
Danger	1	1.5108	1.51078	17.32	0.000
Error	50	4.3606	0.08721		
Lack-of-Fit	49	4.3547	0.08887	14.91	0.203
Pure Error	1	0.0060	0.00596		
Total	53	14.8855			

Model Summary

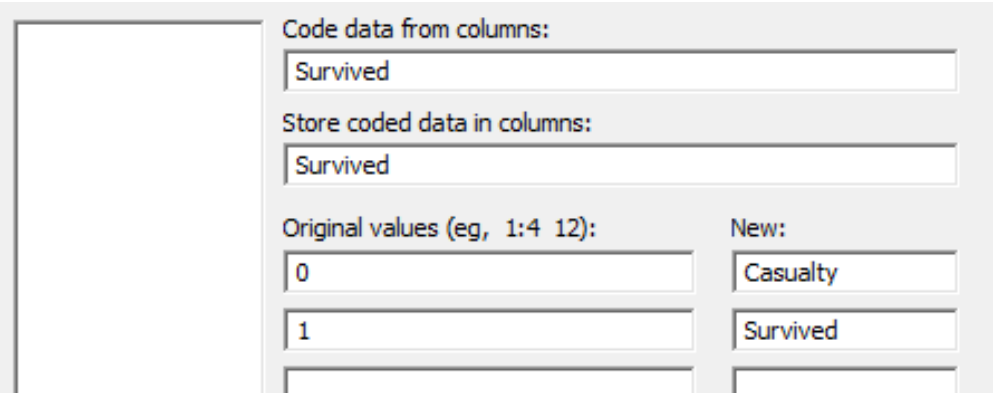
S	R-sq	R-sq(adj)	R-sq(pred)
0.295318	70.71%	68.95%	65.70%

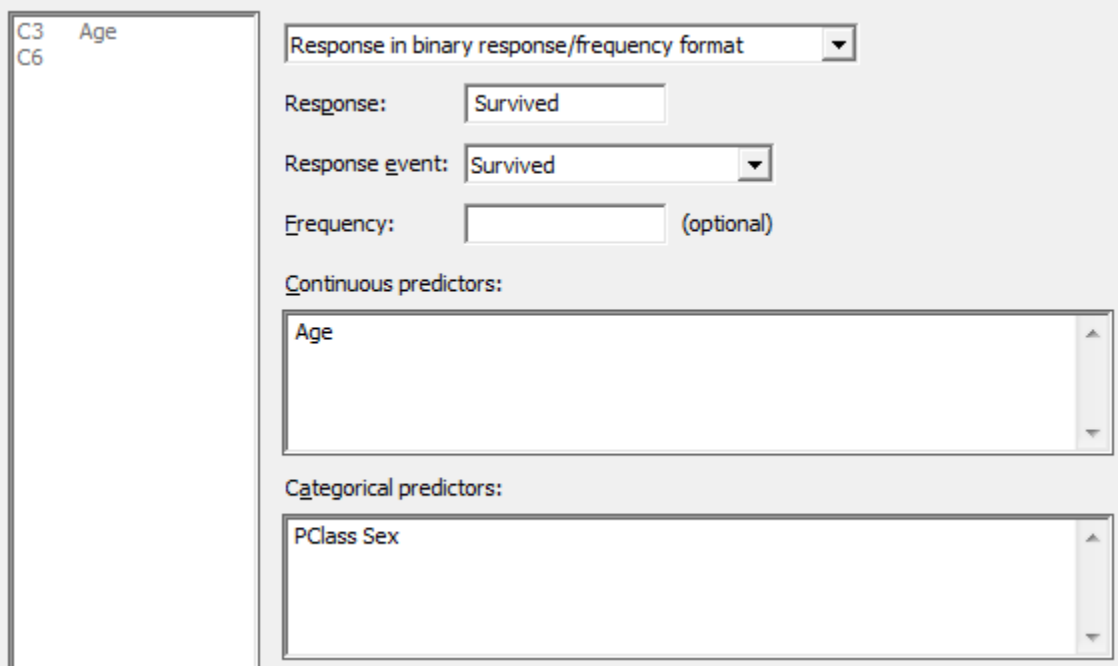




Coefficients

Term	Coef	SE Coef	T-Value	P-Value	VIF
Constant	2.359	0.197	11.97	0.000	
Gestation	-0.002109	0.000409	-5.16	0.000	2.29
Predation	0.421	0.110	3.81	0.000	18.26
Danger	-0.174	0.135	-1.29	0.204	25.06
Exposure	0.0953	0.0568	1.68	0.101	5.44
Predation*Danger	-0.0868	0.0276	-3.15	0.003	37.37

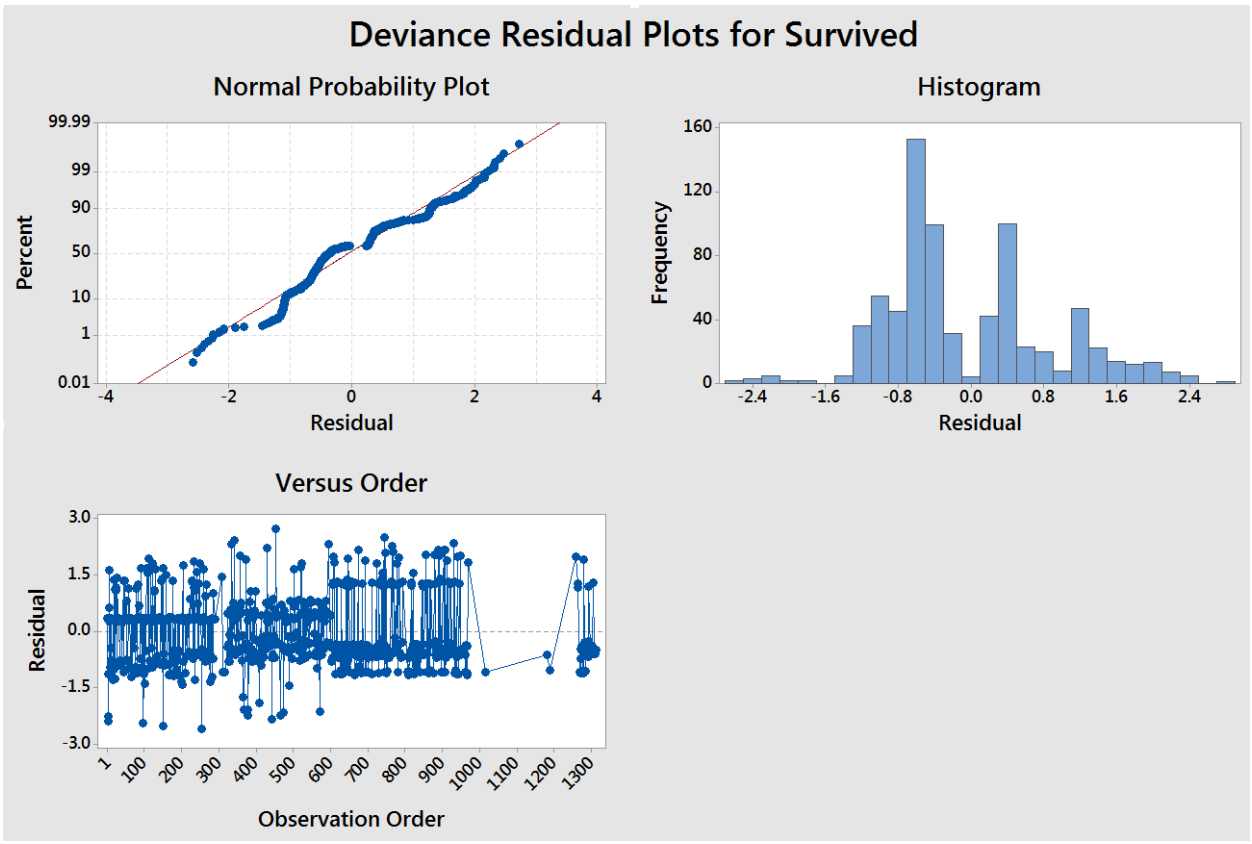


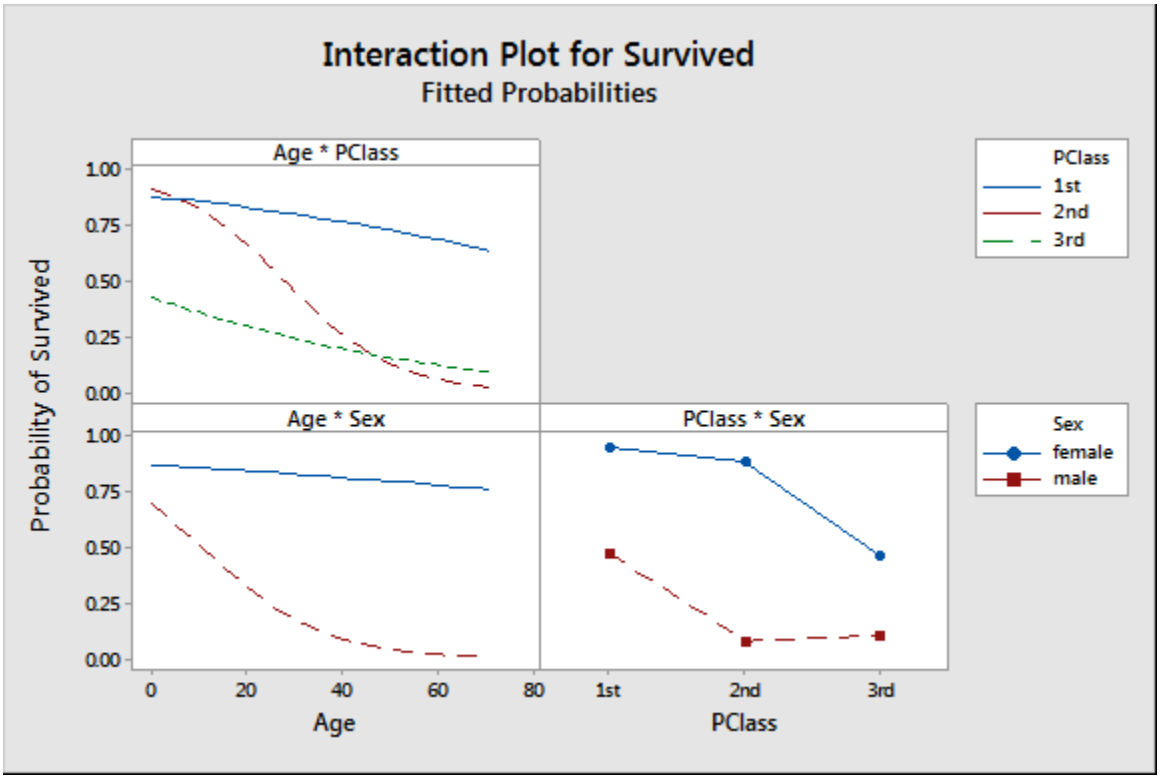


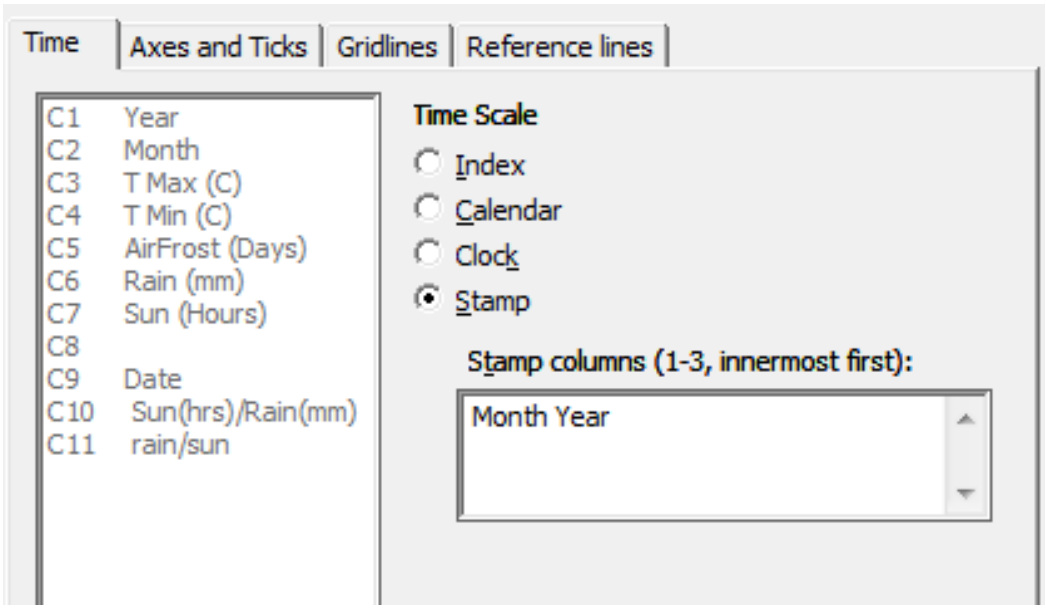
Deviance Table

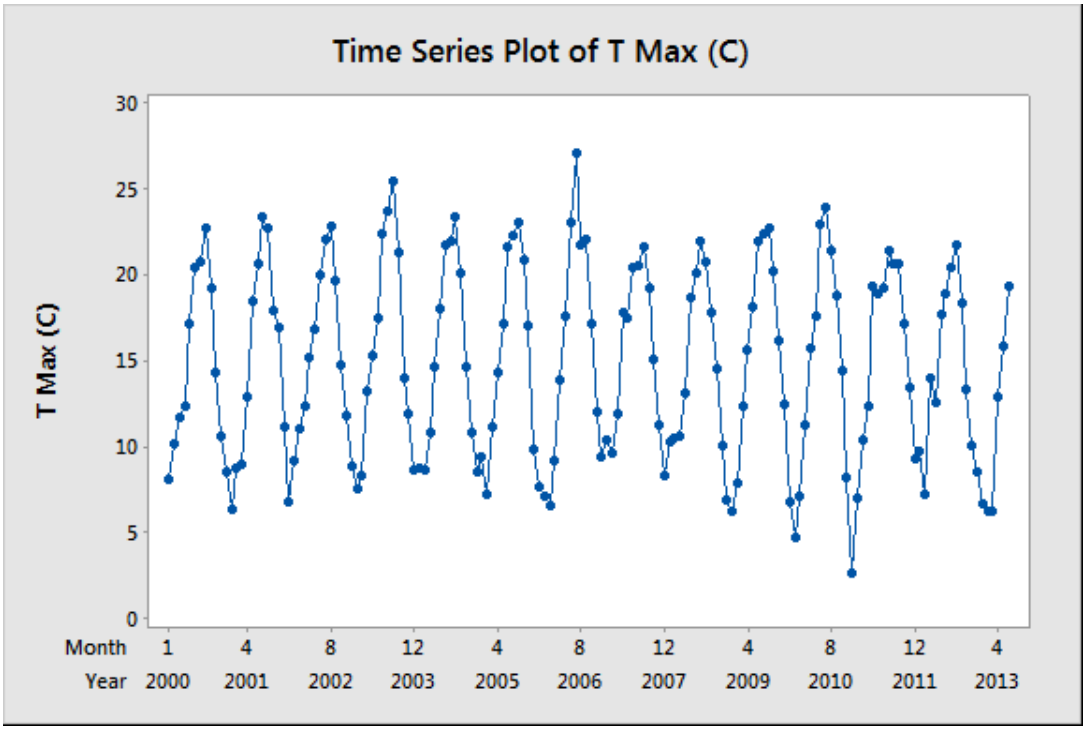
Source	DF	Adj Dev	Adj Mean	Chi-Square	P-Value
Regression	9	383.60	42.6227	383.60	0.000
Age	1	0.46	0.4595	0.46	0.498
PClass	2	32.94	16.4720	32.94	0.000
Sex	1	1.25	1.2526	1.25	0.263
Age*PClass	2	8.64	4.3184	8.64	0.013
Age*Sex	1	13.64	13.6395	13.64	0.000
PClass*Sex	2	21.07	10.5354	21.07	0.000
Error	746	642.66	0.8615		
Total	755	1026.26			

$$Y = \ln\left(\frac{\pi}{1-\pi}\right)$$


Deviance Residual Plots for Survived
Normal Probability Plot
Percent
99.99
99
90
50
10
1
0.01
-4
-2
0
2
4
Residual
Histogram
Frequency
160
120
80
40
0
-2.4
-1.6
-0.8
0.0
0.8
1.6
2.4
Residual
Versus Order
Residual
3.0
1.5
0.0
-1.5
-3.0
1
100
200
300
400
500
600
700
800
900
1000
1100
1200
1300
Observation Order


Interaction Plot for Survived
Fitted Probabilities
Age * PClass
Age * Sex
PClass * Sex
Probability of Survived
1.00
0.75
0.50
0.25
0.00
0
20
40
60
80
Age
1st
2nd
3rd
PClass
PClass
1st
2nd
3rd
Sex
female
male


Time
Axes and Ticks
Gridlines
Reference lines
C1 Year
C2 Month
C3 T Max (C)
C4 T Min (C)
C5 AirFrost (Days)
C6 Rain (mm)
C7 Sun (Hours)
C8
C9 Date
C10 Sun(hrs)/Rain(mm)
C11 rain/sun
Time Scale
Index
Calendar
Clock
Stamp
Stamp columns (1-3, innermost first):
Month Year


Time Series Plot of T Max (C)
T Max (C)
30
25
20
15
10
5
0
Month 1 4 8 12 4 8 12 4 8 12 4
Year 2000 2001 2002 2003 2005 2006 2007 2009 2010 2011 2013

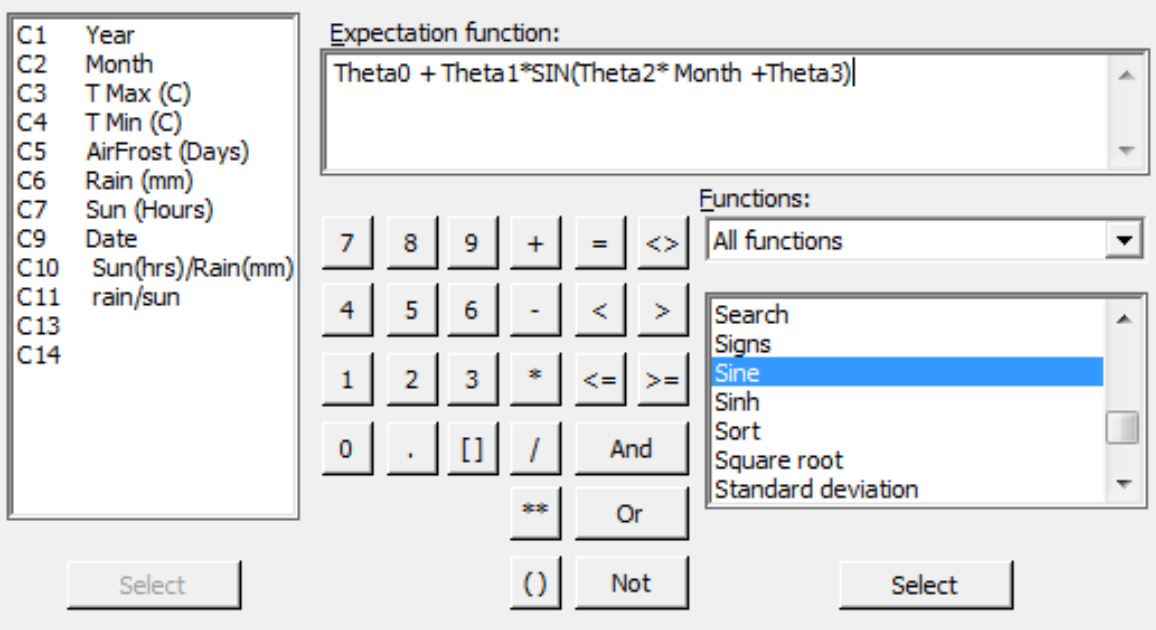
$$\theta_0 + \theta_1 * \sin\left(\theta_2 * Month + \theta_3\right)$$

θ_0 = Mean temperature

θ_1 = Magnitude of the sine wave

$\theta_2 = 2 * \pi / 12$

θ_3 = Offset for the start of the sine wave

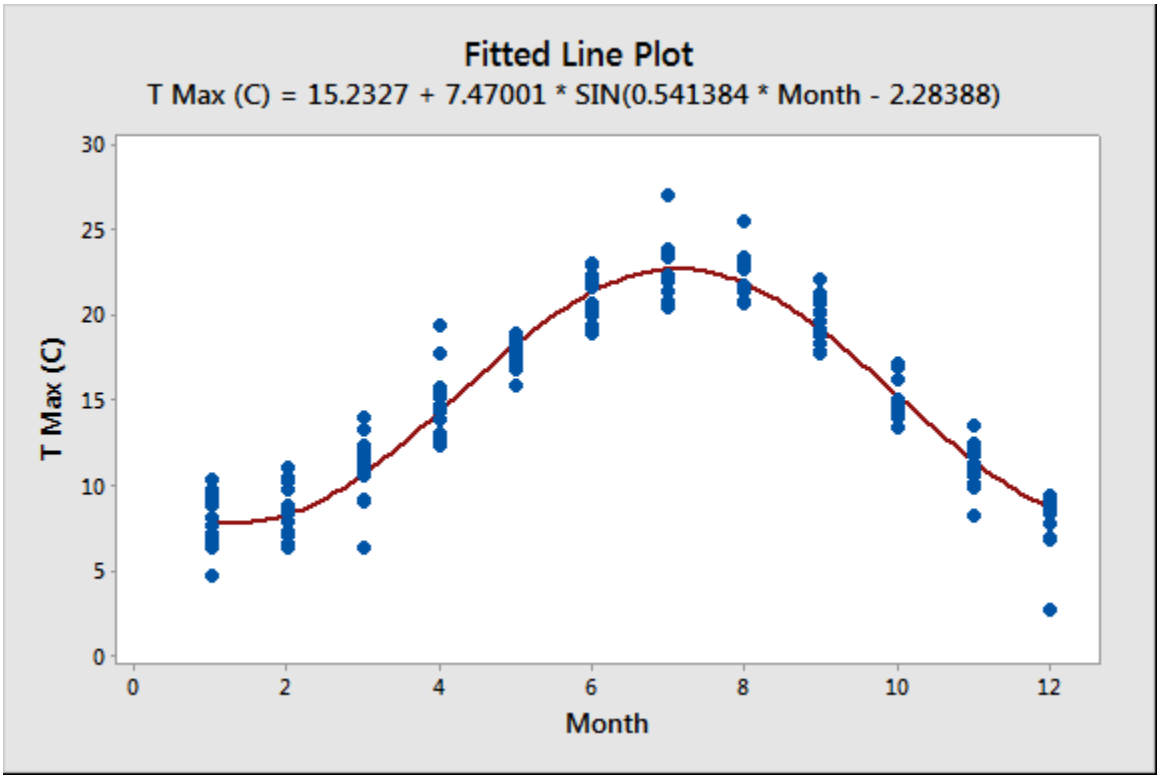


Function

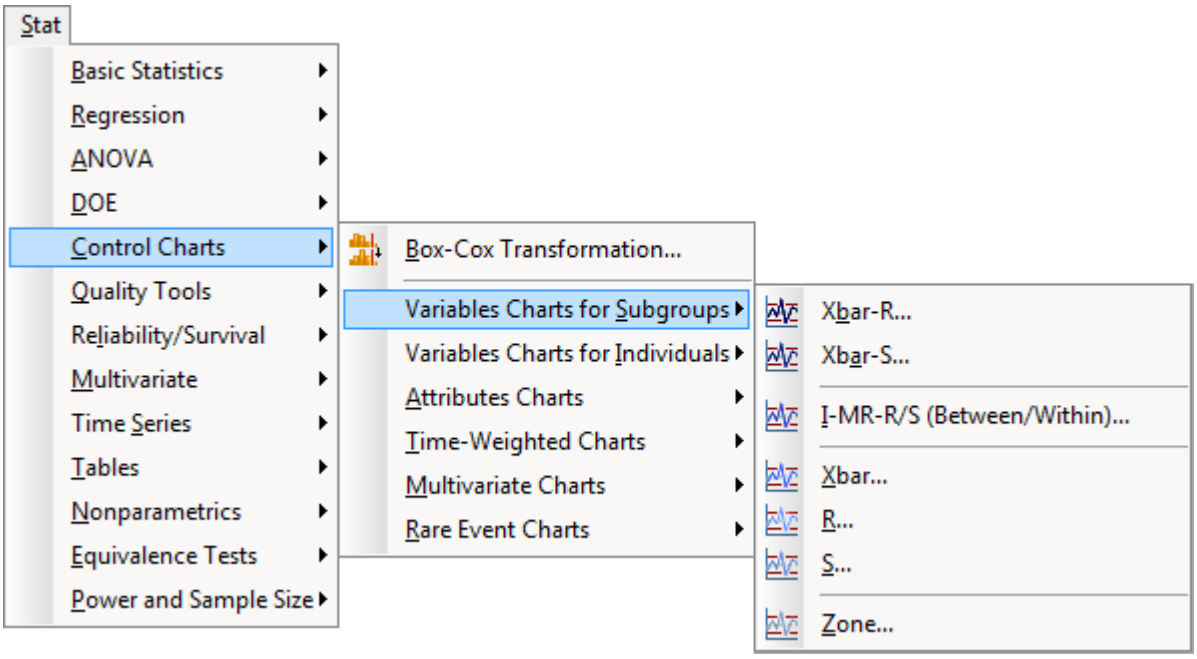
Theta0 + Theta1*SIN(Theta2* Month +Theta3)

Required starting values:

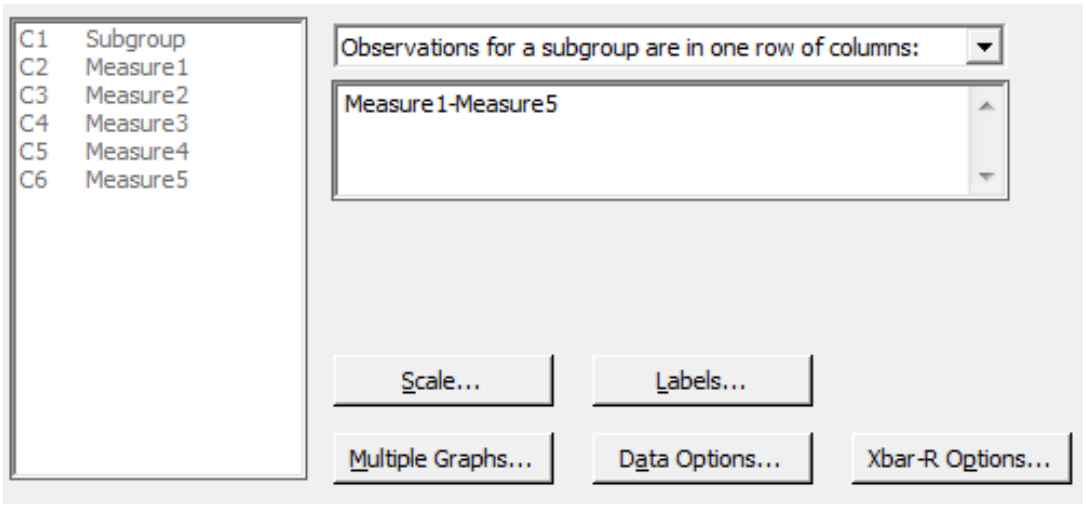
Parameter	Values	Locked
Theta0	15	☐
Theta1	10	☐
Theta2	0.52359878	☐
Theta3	0	☐

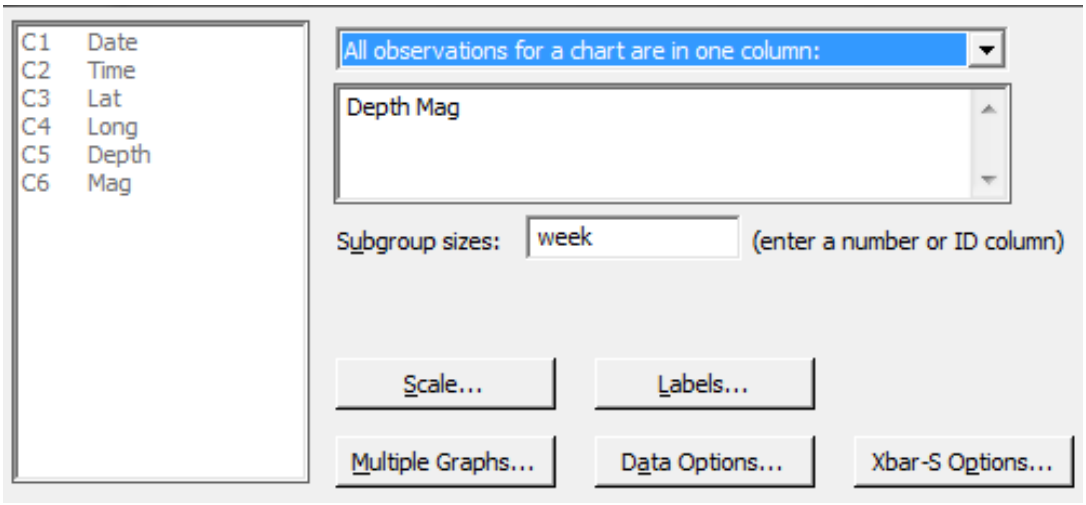


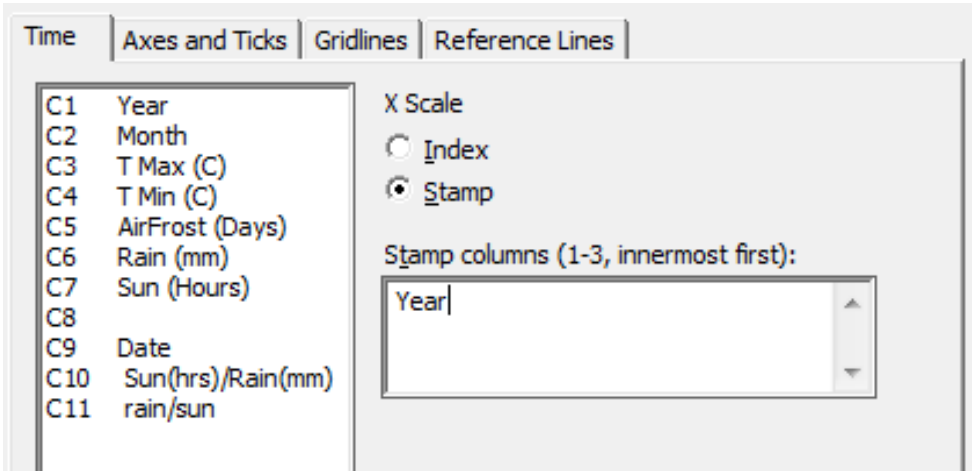
Chapter 6, Understanding Process Variation with Control Charts

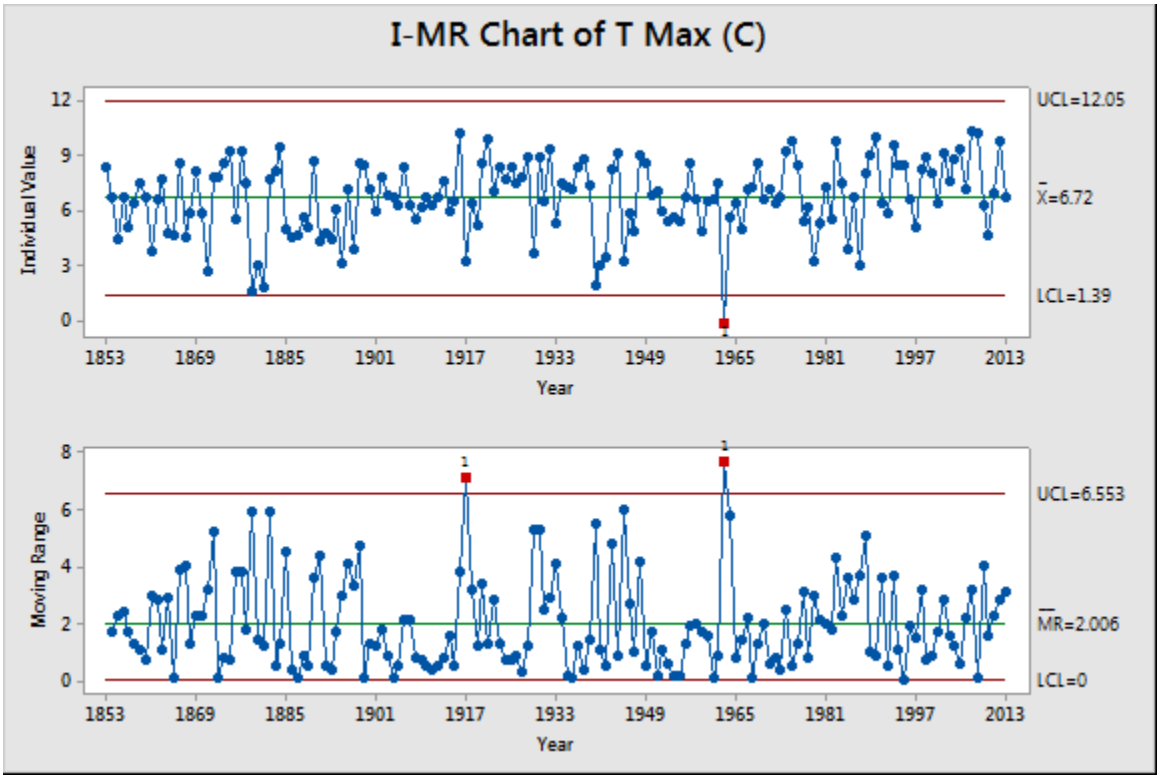


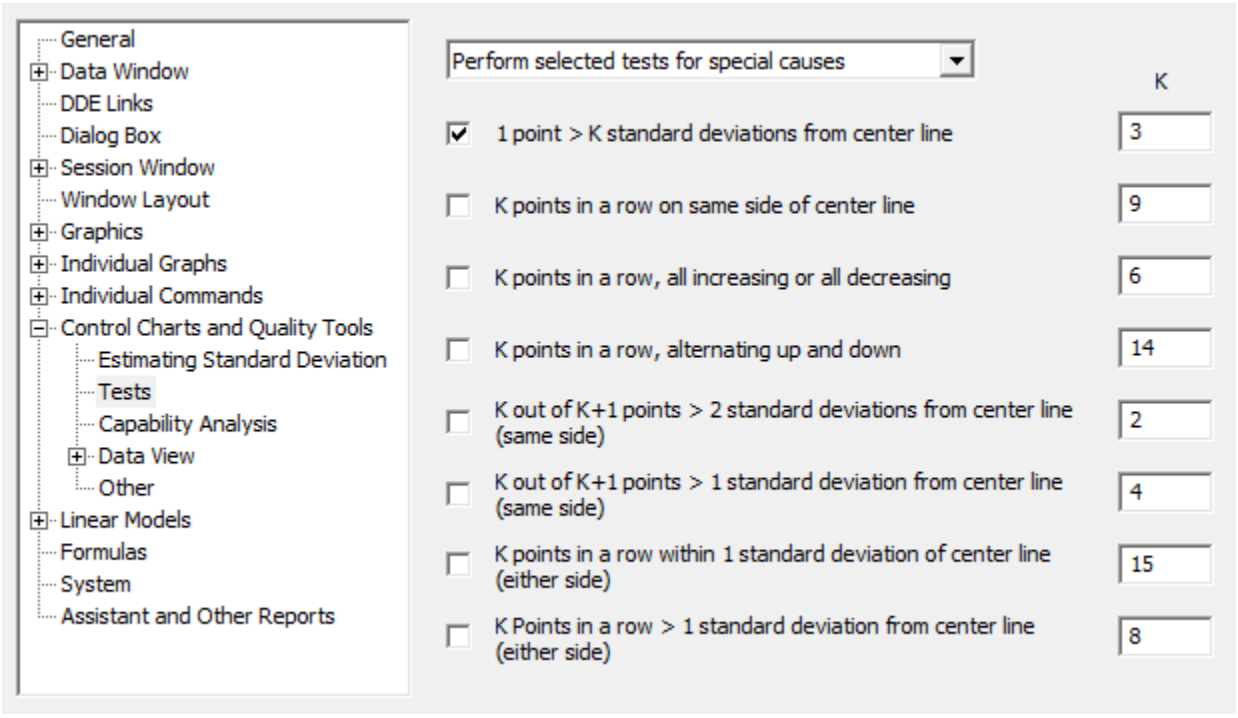
Subgroup	Measure1	Measure2	Measure3	Measure4	Measure5		Stacked Data	Stacked Subgroup
1	15.84	15.55	15.39	15.45	15.75		15.84	1
2	15.79	15.09	14.72	15.20	14.74		15.55	1
3	15.73	15.35	15.06	15.40	15.52		15.39	1
							15.45	1
							15.75	1
							15.79	2
							15.09	2
							14.72	2
							15.20	2
							14.74	2
							15.73	3
							15.35	3
							15.06	3
							15.40	3
							15.52	3

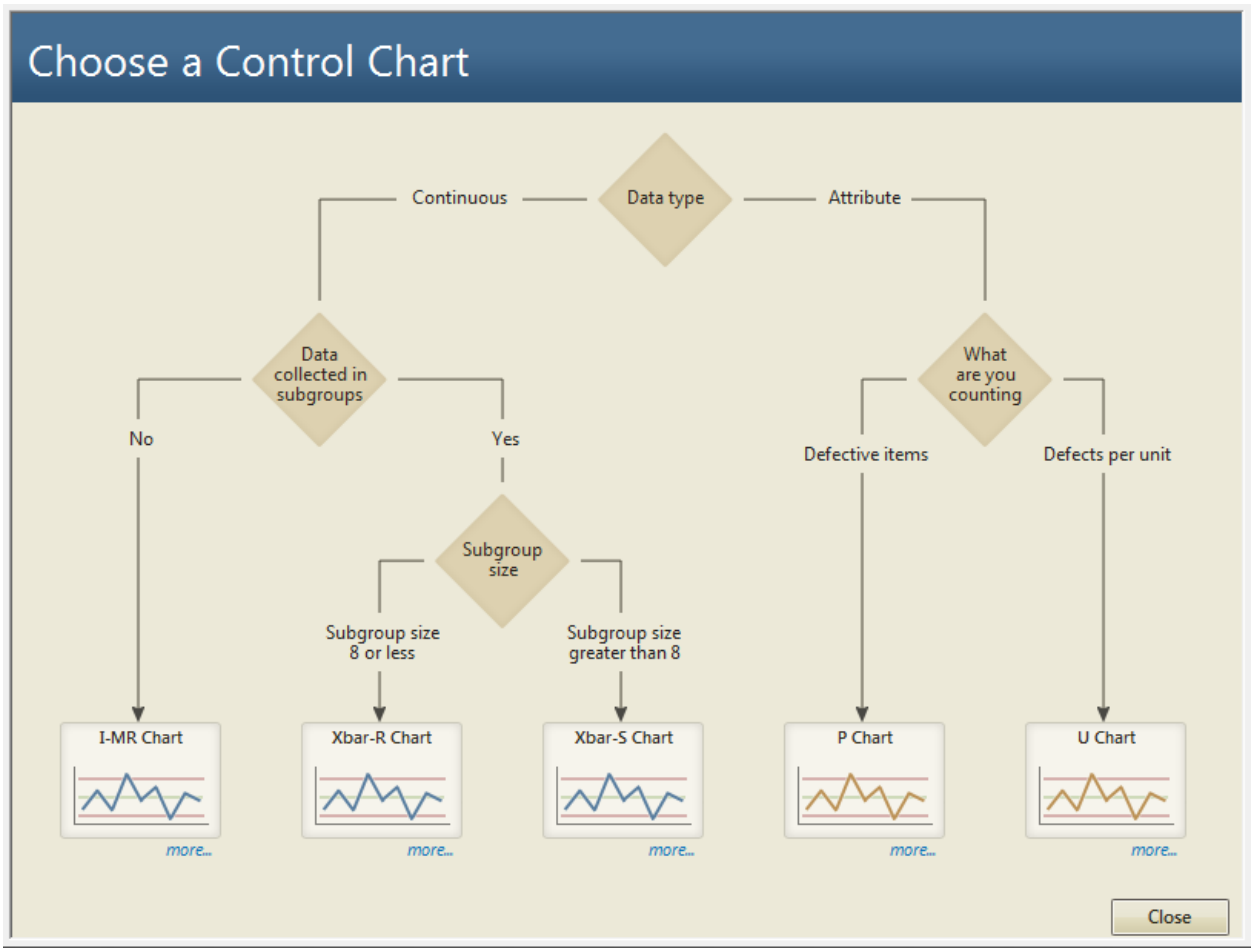

C1 Subgroup
C2 Measure1
C3 Measure2
C4 Measure3
C5 Measure4
C6 Measure5
Observations for a subgroup are in one row of columns:
Measure1-Measure5
Scale...
Labels...
Multiple Graphs...
Data Options...
Xbar-R Options...


C1 Date
C2 Time
C3 Lat
C4 Long
C5 Depth
C6 Mag
All observations for a chart are in one column:
Depth Mag
Subgroup sizes: week
(enter a number or ID column)
Scale...
Labels...
Multiple Graphs...
Data Options...
Xbar-S Options...


Time
Axes and Ticks
Gridlines
Reference Lines
C1 Year
C2 Month
C3 T Max (C)
C4 T Min (C)
C5 AirFrost (Days)
C6 Rain (mm)
C7 Sun (Hours)
C8
C9 Date
C10 Sun(hrs)/Rain(mm)
C11 rain/sun
X Scale
Index
Stamp
Stamp columns (1-3, innermost first):
Year


I-MR Chart of T Max (C)
Individual Value
12
9
6
3
0
UCL=12.05
X=6.72
LCL=1.39
1853
1869
1885
1901
1917
1933
1949
1965
1981
1997
2013
Year
Moving Range
8
6
4
2
0
UCL=6.553
MR=2.006
LCL=0
1
1
1853
1869
1885
1901
1917
1933
1949
1965
1981
1997
2013
Year

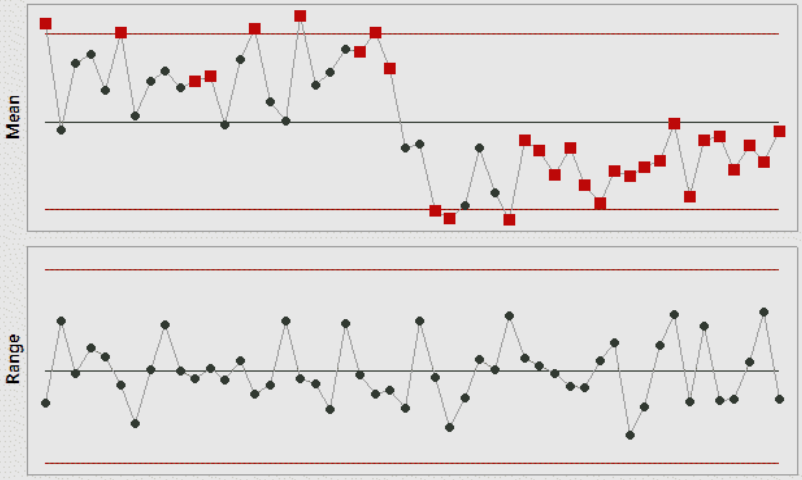

General
Data Window
DDE Links
Dialog Box
Session Window
Window Layout
Graphics
Individual Graphs
Individual Commands
Control Charts and Quality Tools
Estimating Standard Deviation
Tests
Capability Analysis
Data View
Other
Linear Models
Formulas
System
Assistant and Other Reports
Perform selected tests for special causes
K
1 point > K standard deviations from center line
3
K points in a row on same side of center line
9
K points in a row, all increasing or all decreasing
6
K points in a row, alternating up and down
14
K out of K+1 points > 2 standard deviations from center line (same side)
2
K out of K+1 points > 1 standard deviation from center line (same side)
4
K points in a row within 1 standard deviation of center line (either side)
15
K Points in a row > 1 standard deviation from center line (either side)
8


Choose a Control Chart
Data type
Continuous
Attribute
Data collected in subgroups
No
Yes
What are you counting
Defective items
Defects per unit
Subgroup size
Subgroup size 8 or less
Subgroup size greater than 8
I-MR Chart
Xbar-R Chart
Xbar-S Chart
P Chart
U Chart
more...
more...
more...
more...
more...
Close

Xbar-R Chart of Measure1, ..., Measure5
Report Card

Check	Status	Description
Stability		The process variation is stable. No subgroups are out of control on the R chart. However, the process mean may not be stable. 30 (60.0%) subgroups are out of control on the Xbar chart (you may see 0.7% out-of-control subgroups by chance, even when the process is stable). You should investigate out-of-control subgroups and omit those with special causes from the calculations.
Amount of Data		You do not need to be concerned about the precision of your control limits because 100 or more data points are included in the calculations.
Correlated Data		Your data passed the correlation test. The correlation between consecutive data points within each subgroup is less than 0.2.
Alternative Charts		This chart is intended to monitor process control. If your primary objective is to explore your data or compare your process before and after a change, use the Graphical Analysis Control Charts or the Before/After Control Charts.

Xbar-R Chart of Measure1, ..., Measure5
Stability Report

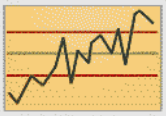


Assess the stability of the mean and variation of your process and look for patterns that can help you distinguish between common and special causes. Typically, a process that exhibits only common causes has a constant mean and constant variability. However, global trends or cyclical patterns may also be common causes. Other patterns, such as shifts and drifts, may be special causes.

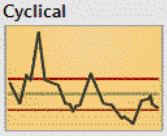
Chart	Test	Out-of-Control Subgroups
Xbar	Test 1: Outside control limits	1, 6, 15, 18, 23, 27, 28, 32
	Test 2: Shift in mean	11, 12, 22-24, 33-50

Look for these patterns:

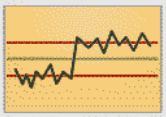
Global Trend



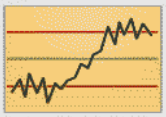
Cyclical



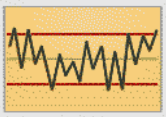
Shifts



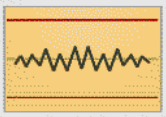
Drifts



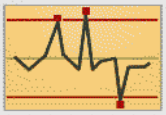
Oscillation

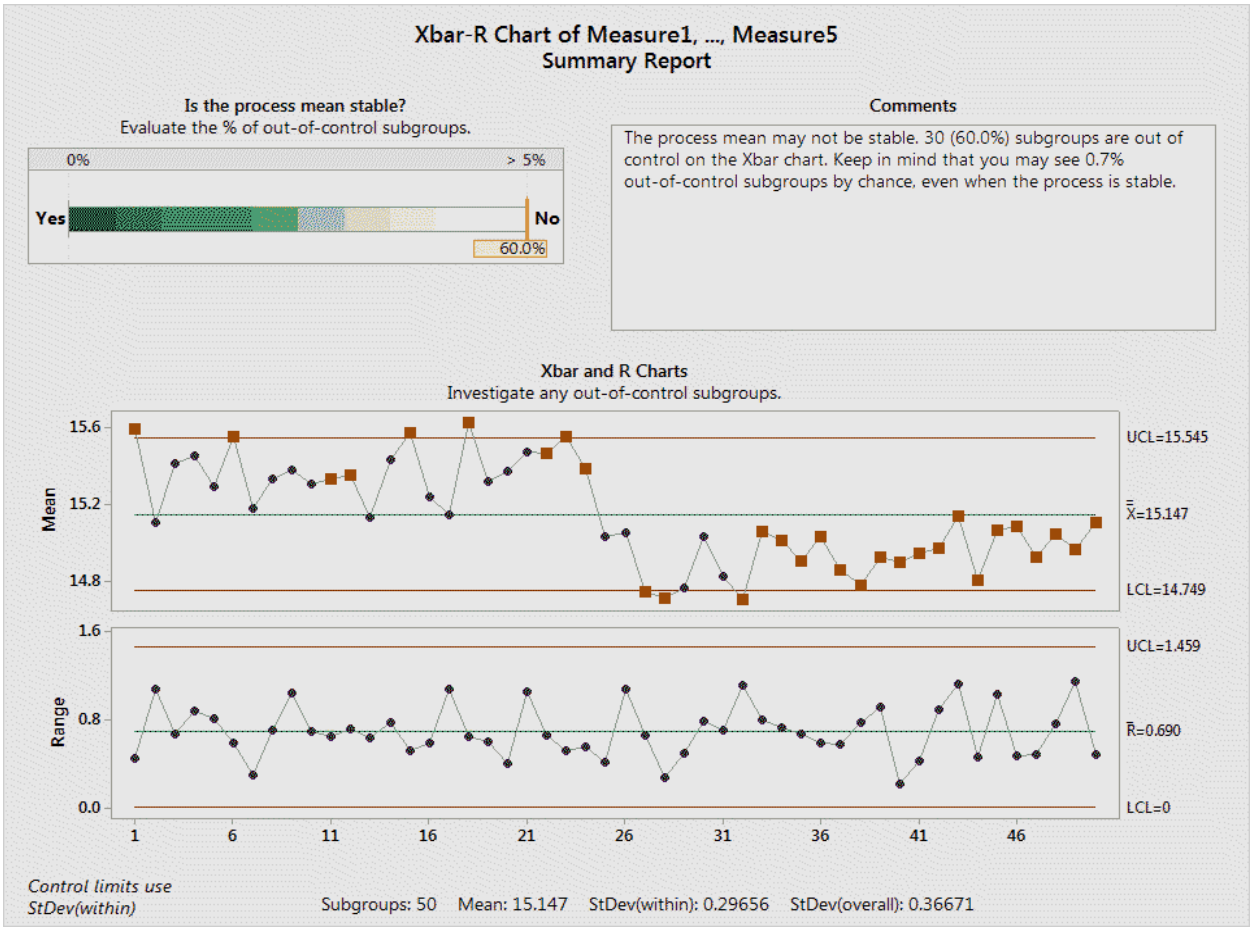


Mixture

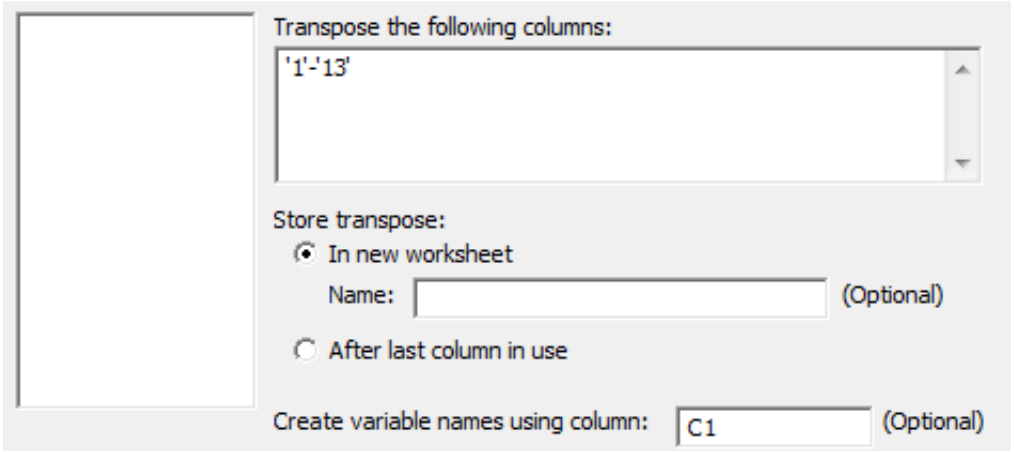


Excessive Out of Control

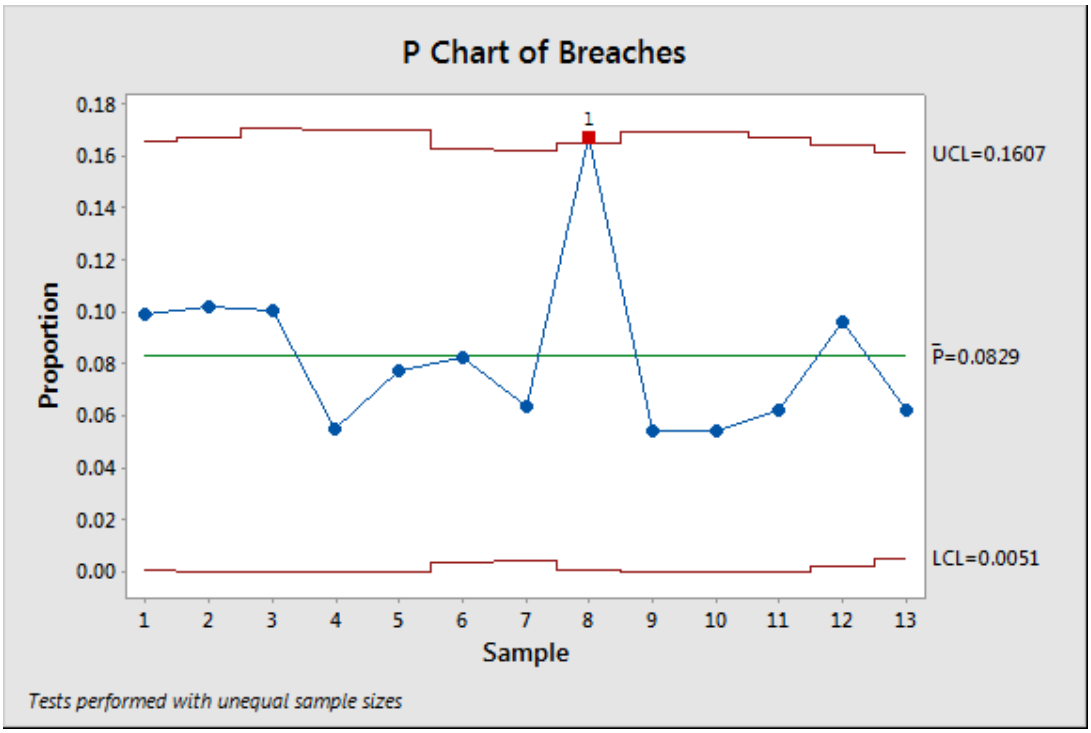


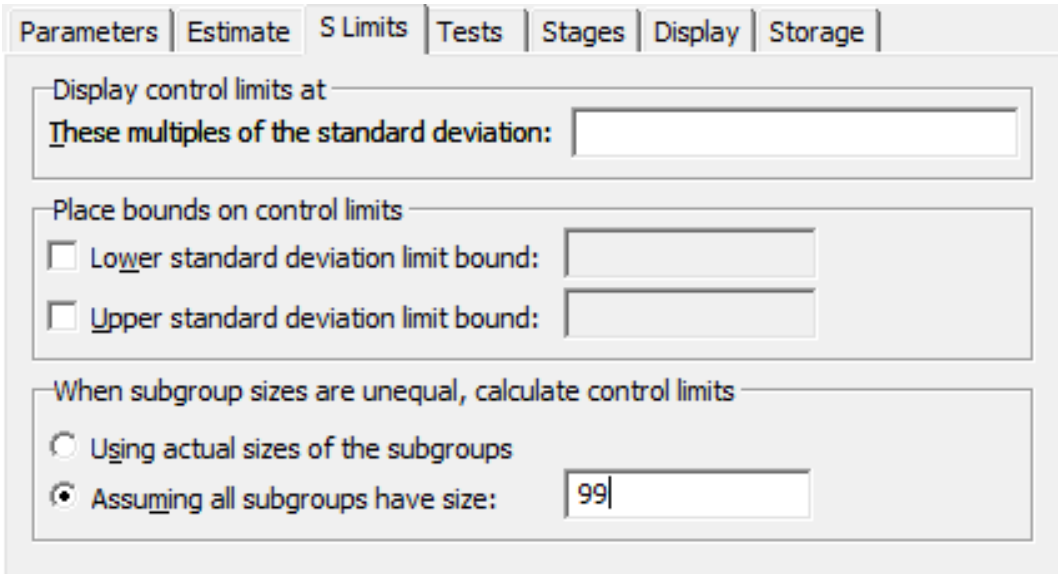


	1	2	3	4	5	6	7	8	9	10	11	12	13
A&E attendance	101	98	90	91	91	109	110	102	93	92	97	104	113
Breaches	10	10	9	5	7	9	7	17	5	5	6	10	7

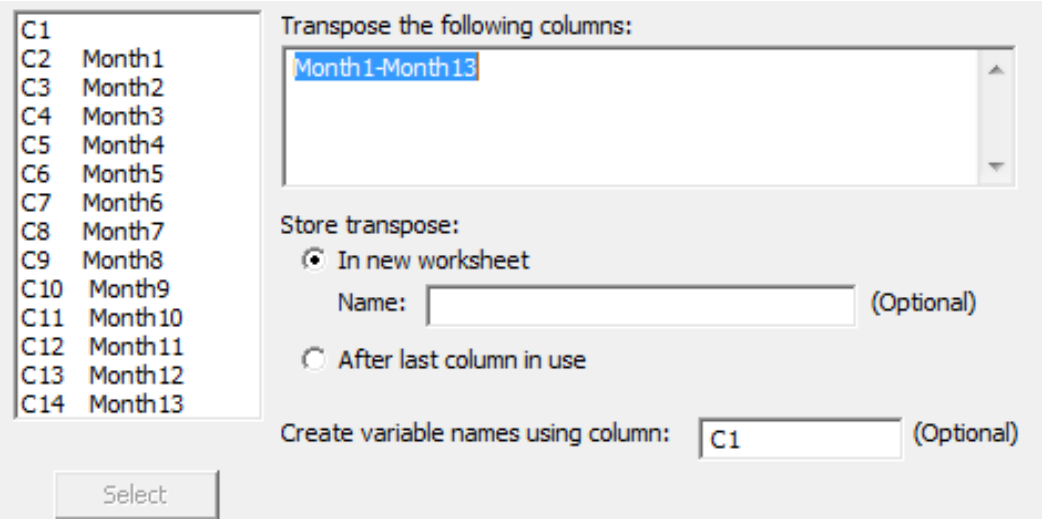


$$p \pm 3\sqrt{\frac{p(1-p)}{n_i}}$$

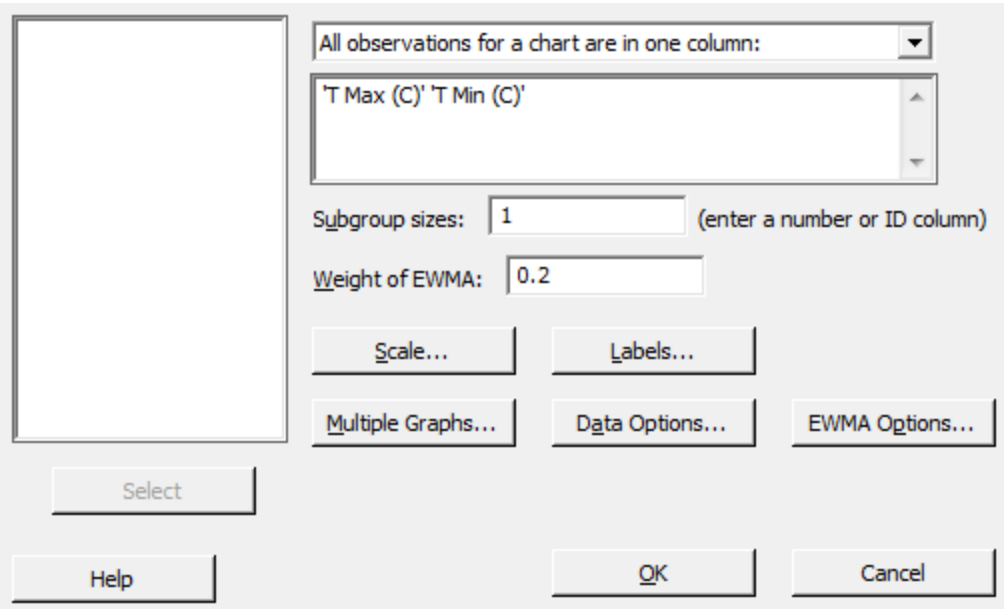




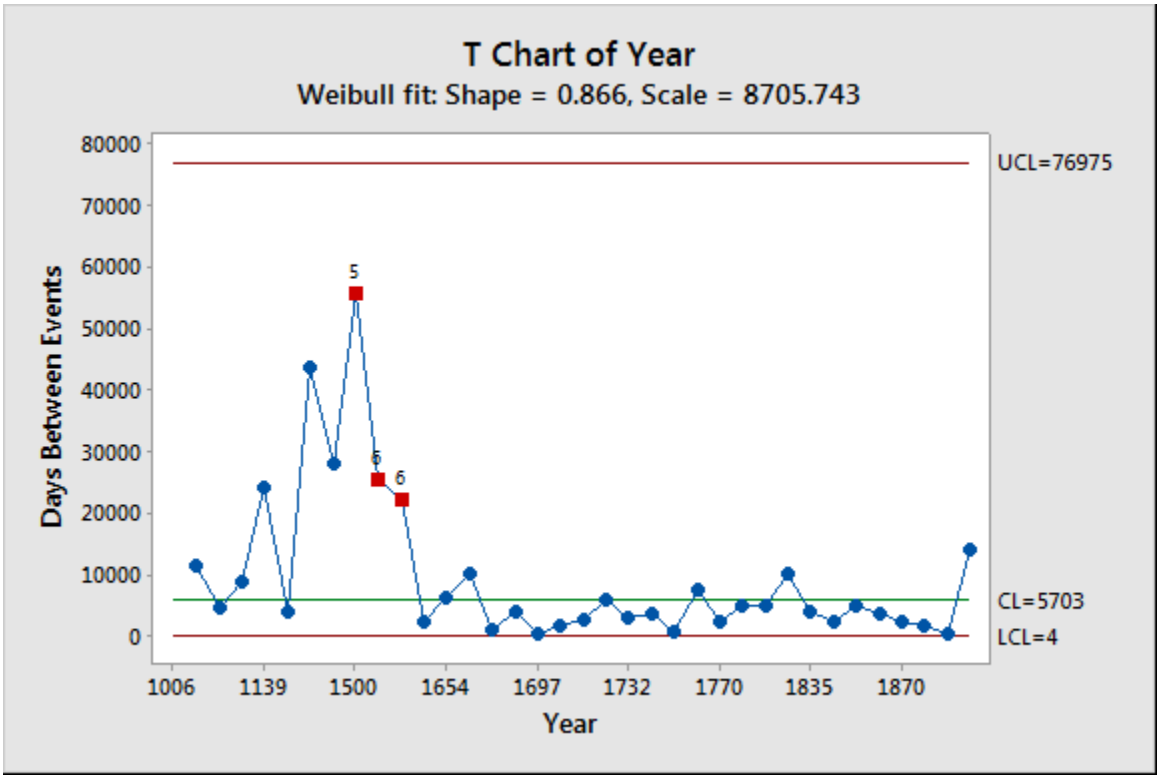
	Month1	Month2	Month3	Month4	Month5	Month6	Month7	Month8	Month9	Month10	Month11	Month12	Month13
Falls	1	4	3	4	2	3	5	2	0	2	6	2	5
Beds Occupied	1048	996	918	995	866	896	876	930	832	830	829	822	912



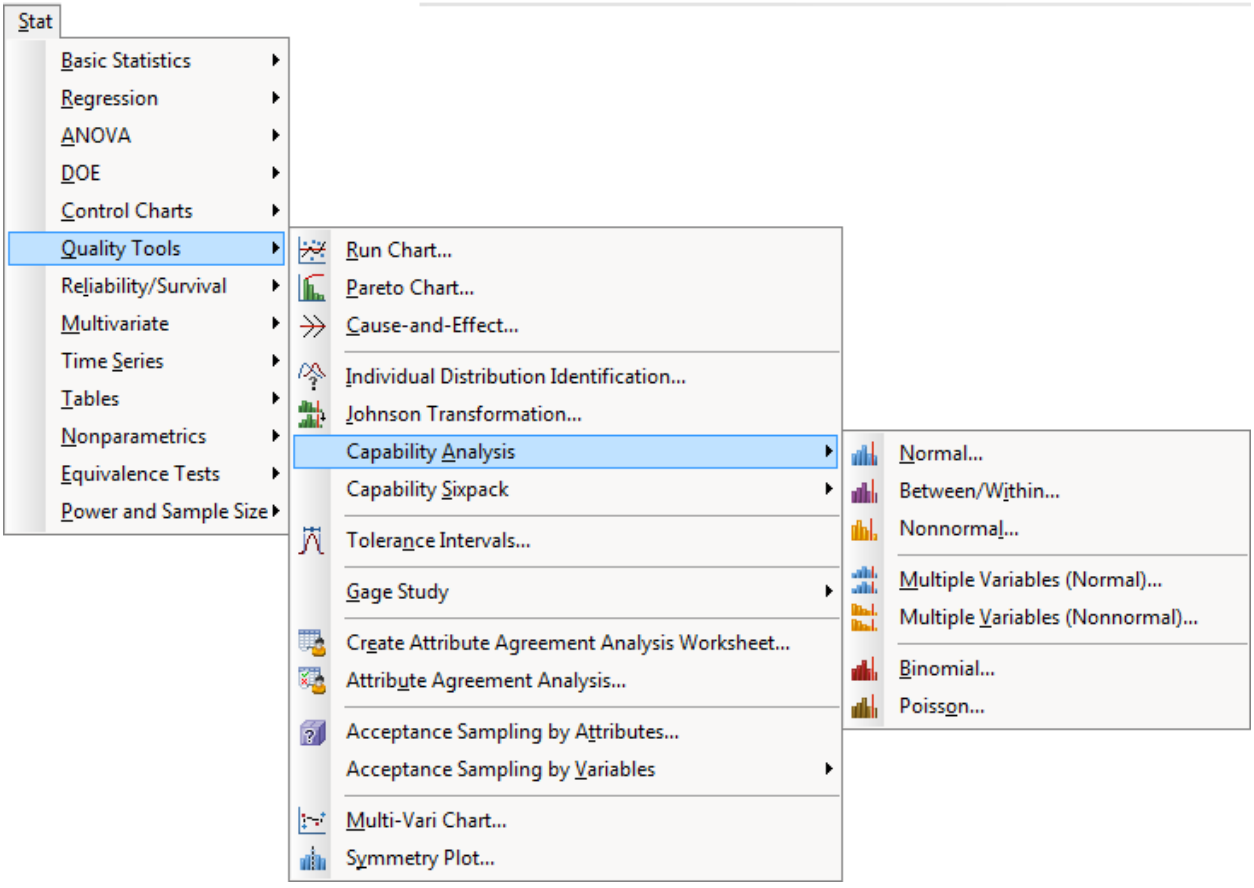
$$u \pm 3\sqrt{\frac{\mu}{n_i}}$$

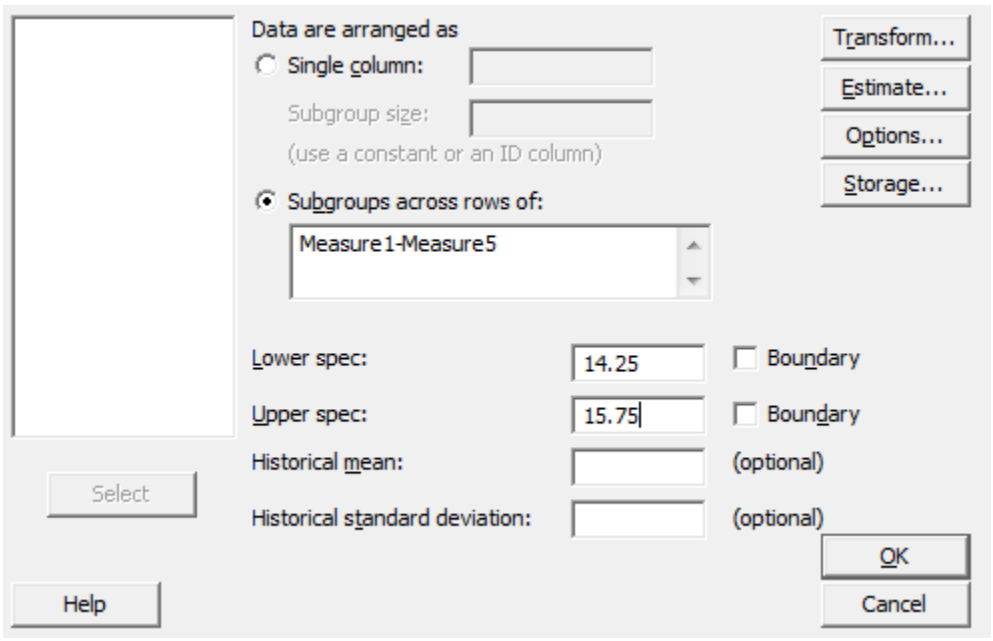


```
EWMAChart 'T Max (C)' 1.
NOTE *** Closed graph:  Graph4

* ERROR * Could not process command with missing subgroup mean.
```

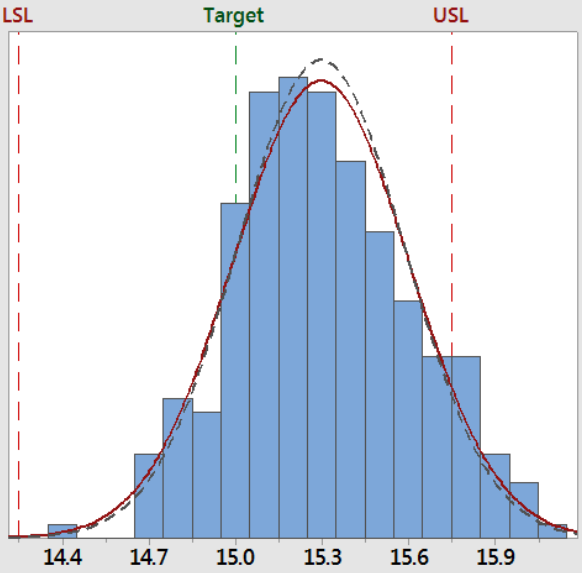


Chapter 7, Capability, Process Variation, and Specifications





Process Capability Report for Measure1, ..., Measure5
(using 95.0% confidence)



Process Data	
LSL	14.25
Target	15
USL	15.75
Sample Mean	15.2972
Sample N	250
StDev(Overall)	0.304343
StDev(Within)	0.291146

Overall
Within

Overall Capability	
Pp	0.82
CI for Pp	(0.75, 0.89)
PPL	1.15
PPU	0.50
Ppk	0.50
CI for Ppk	(0.44, 0.56)
Cpm	0.59
LB for Cpm	0.55

Potential (Within) Capability	
Cp	0.86
CI for Cp	(0.77, 0.94)
CPL	1.20
CPU	0.52
Cpk	0.52
CI for Cpk	(0.45, 0.58)

Performance	Observed	Expected Overall	Expected Within
PPM < LSL	0.00	290.08	161.15
PPM > USL	88000.00	68384.90	59929.17
PPM Total	88000.00	68674.98	60090.32

C1 Wait time (1 Mins
C2 Wait time (5mins

Select

Data are arranged as

Single column: 'Wait time (1 Mins

Subgroup size: 1

(use a constant or an ID column)

Subgroups across rows of:

Use all distributions and transformations

Specify

Distribution 1: Normal

Distribution 2: Exponential

Distribution 3: Weibull

Distribution 4: Gamma

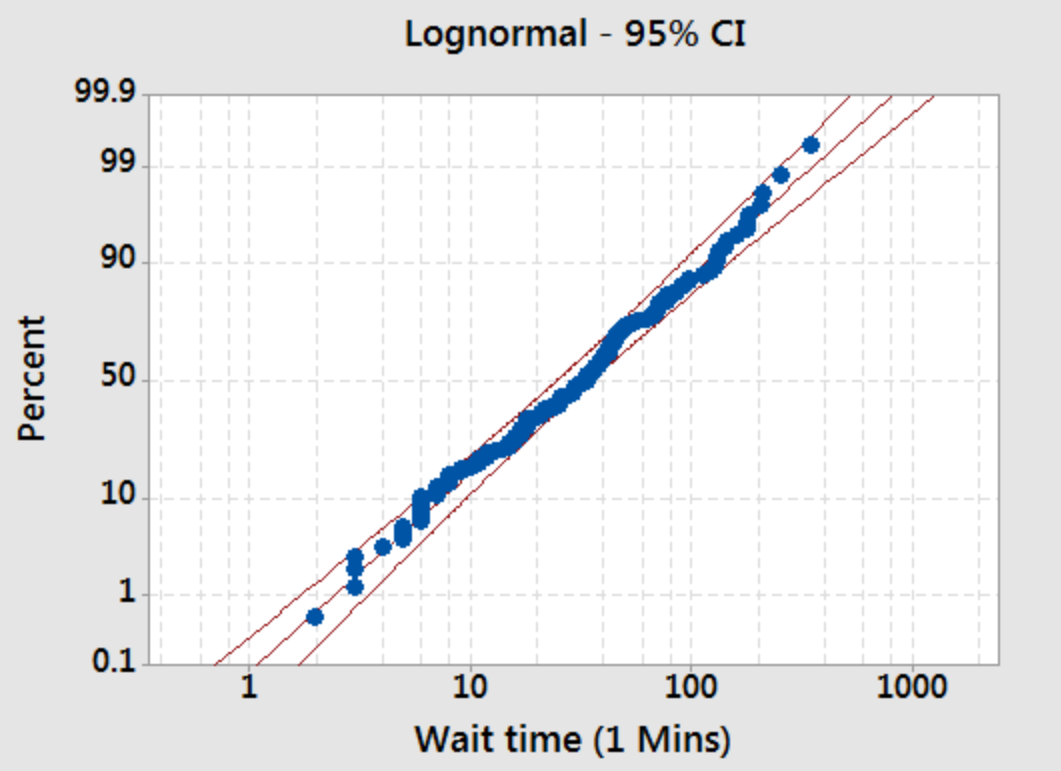
Box-Cox...

Johnson...

Options...

Results...

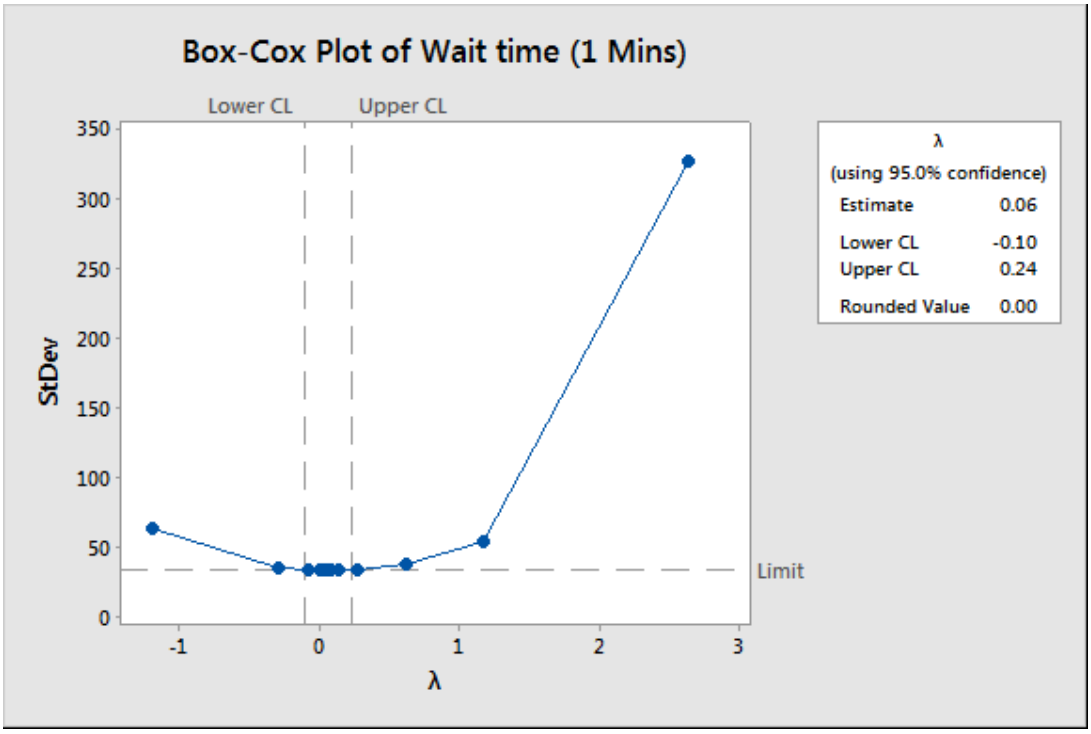
OK

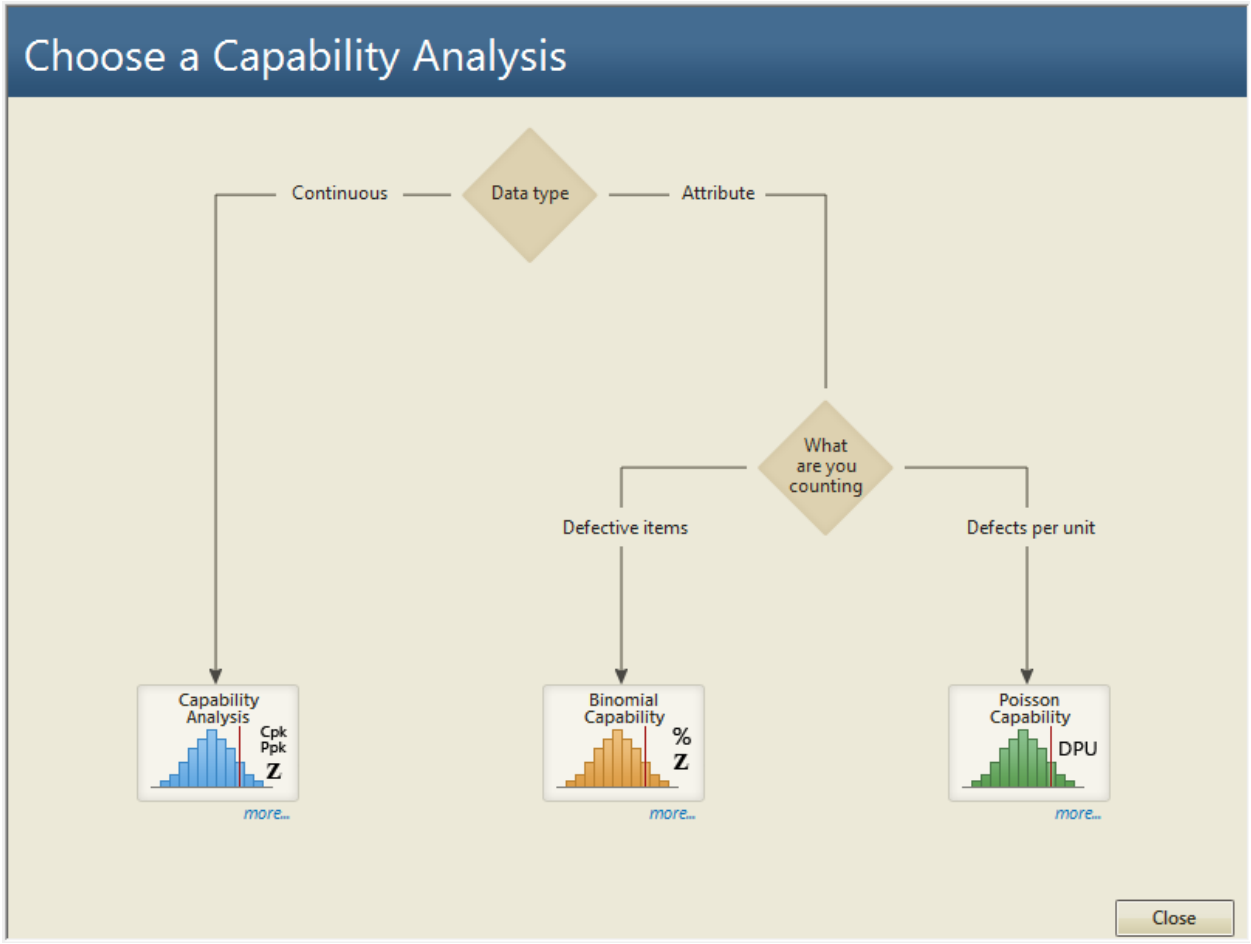


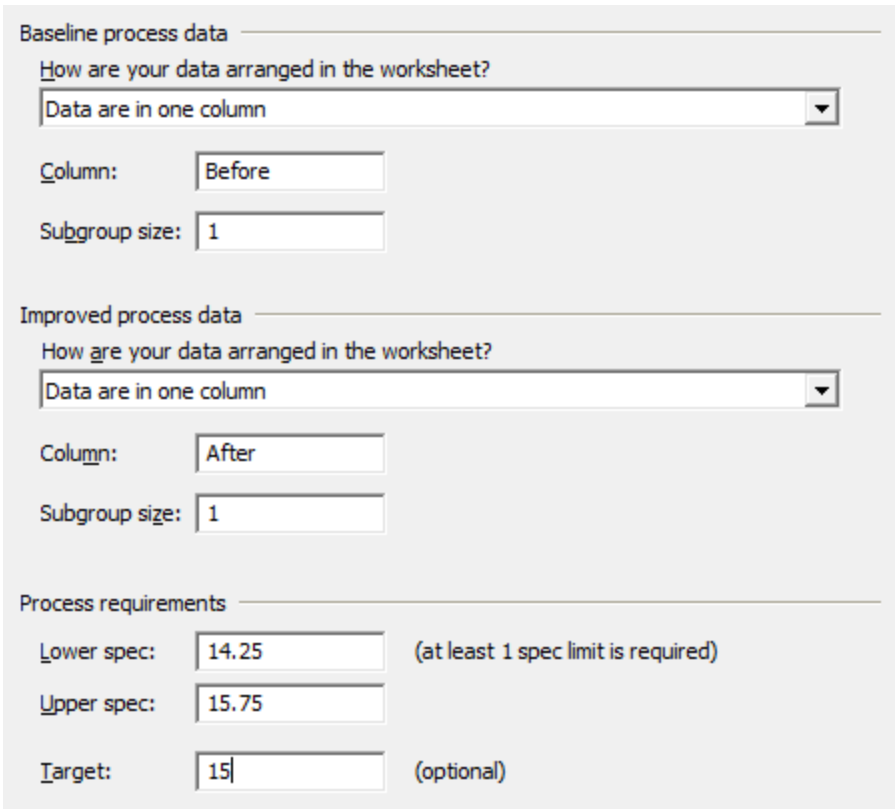
Goodness of Fit Test

Distribution	AD	P	LRT P
Normal	10.511	<0.005	
Box-Cox Transformation	0.394	0.371	
Lognormal	0.394	0.371	
3-Parameter Lognormal	0.420	*	0.857
Exponential	1.110	0.087	
2-Parameter Exponential	0.906	0.141	0.003
Weibull	1.124	<0.010	
3-Parameter Weibull	0.632	0.103	0.001
Smallest Extreme Value	17.844	<0.010	
Largest Extreme Value	4.453	<0.010	
Gamma	1.226	<0.005	
3-Parameter Gamma	0.765	*	0.003
Logistic	6.810	<0.005	
Loglogistic	0.455	0.217	
3-Parameter Loglogistic	0.548	*	0.235
Johnson Transformation	0.306	0.562	

$$PpU = \frac{UCL - X_{0.5}}{X_{0.99865} - X_{0.5}}$$


Box-Cox Plot of Wait time (1 Mins)
Lower CL
Upper CL
StDev
350
300
250
200
150
100
50
0
Limit
-1
0
1
2
3
λ
λ
(using 95.0% confidence)
Estimate 0.06
Lower CL -0.10
Upper CL 0.24
Rounded Value 0.00


Choose a Capability Analysis
Data type
Continuous
Attribute
What are you counting
Defective items
Defects per unit
Capability Analysis
Cpk
Ppk
Z
more...
Binomial Capability
%
Z
more...
Poisson Capability
DPU
more...
Close




```
Sample Size                       67
Critical Distance (k Value)       2.66087
Maximum Standard Deviation (MSD)  0.259840

Z.LSL = (mean - lower spec)/standard deviation
Z.USL = (upper spec - mean)/standard deviation
Accept lot if standard deviation <= MSD, Z.LSL >= k and Z.USL >= k; otherwise reject.


  Percent  Probability  Probability
Defective    Accepting    Rejecting    AOQ     ATI
      0.1        0.952        0.048  0.094   304.6
      1.0        0.106        0.894  0.105  4475.6

Average outgoing quality limit (AOQL) = 0.200 at 0.394 percent defective.
```

Compare User Defined Sampling Plans

Options...

Graphs...

Measurement type: Go / no go (defective)

Units for quality levels: Percent defective

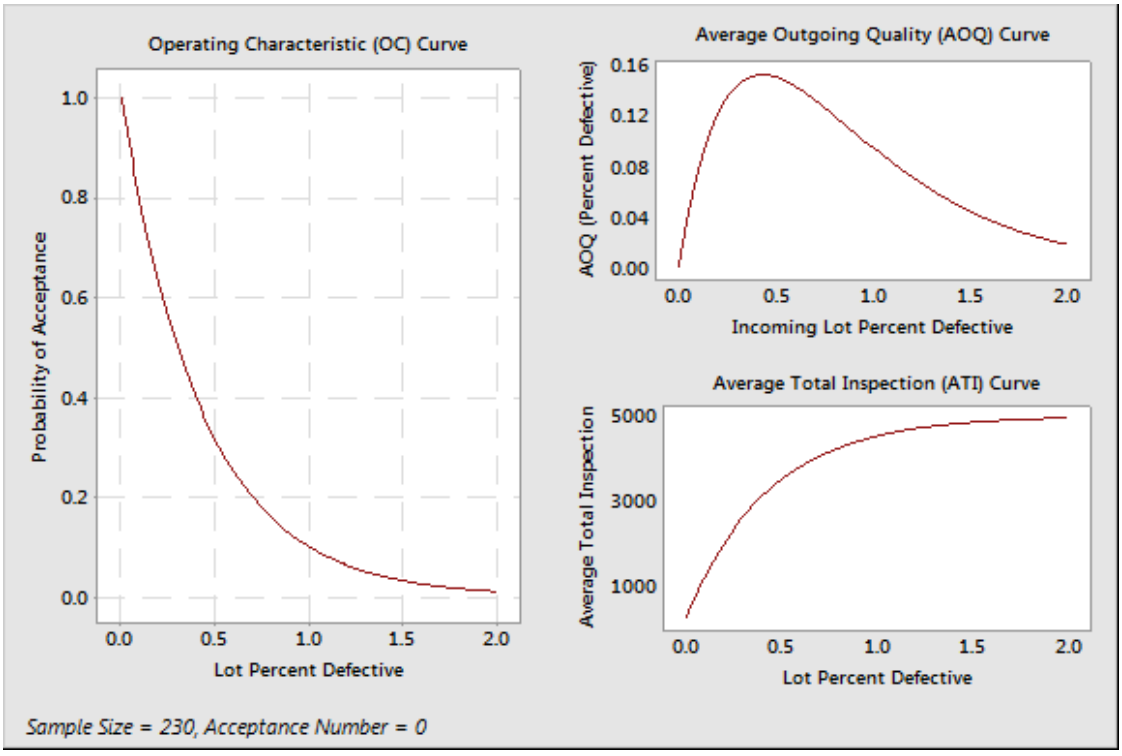
Acceptable quality level (AQL): .1

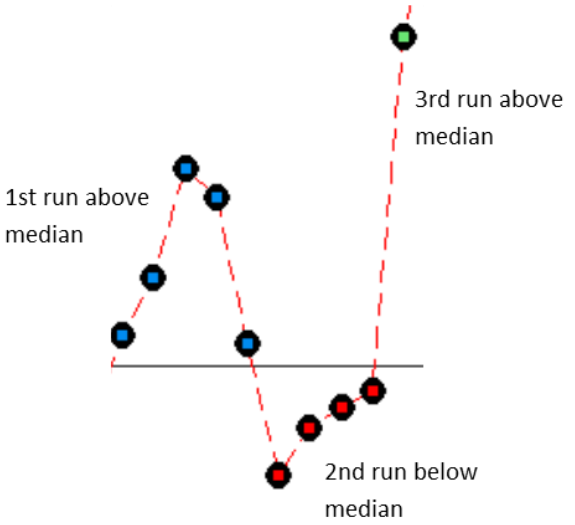
Rejectable quality level (RQL or LTPD): 1

Sample sizes: 230

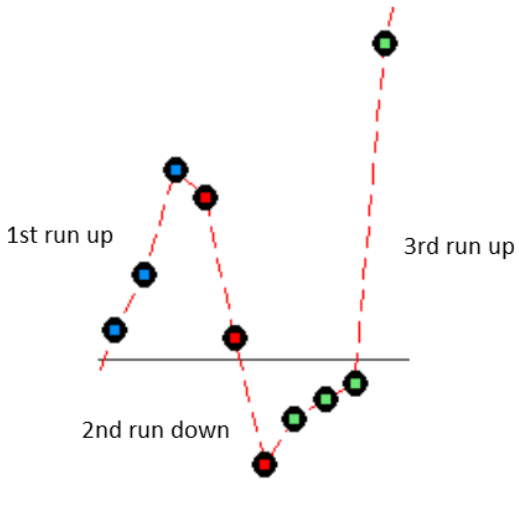
Acceptance numbers: 0

Lot size: 5000

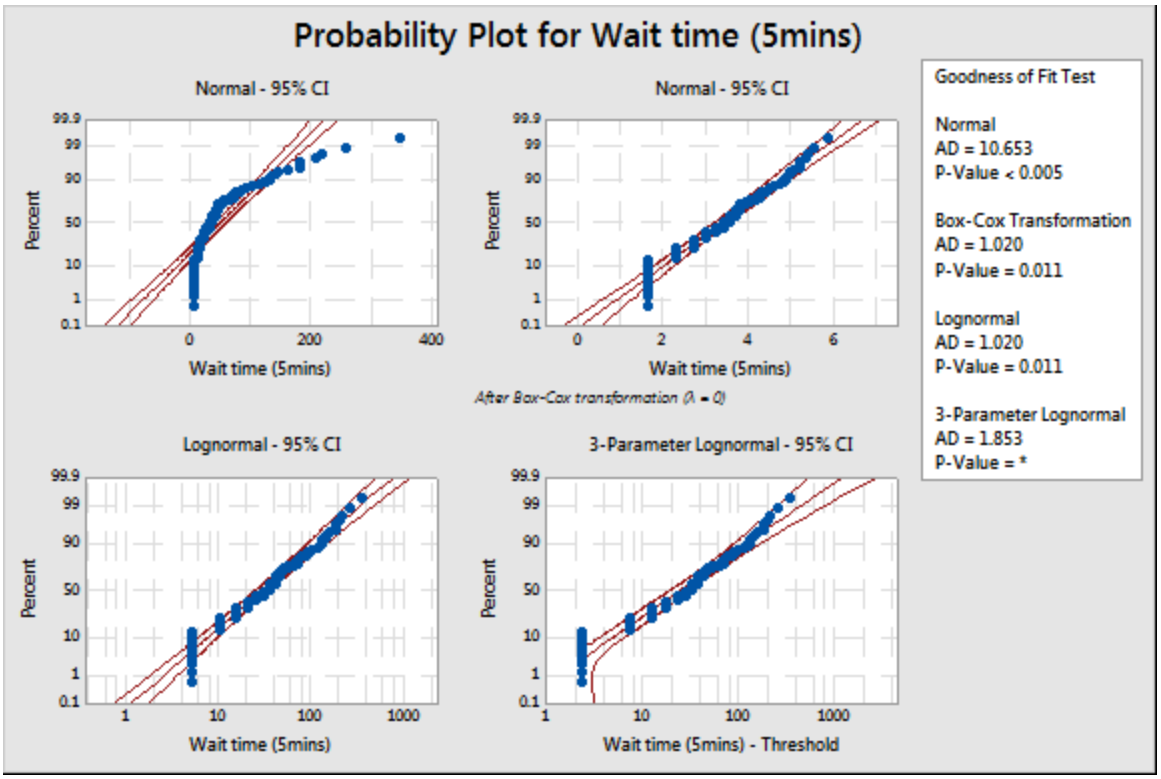




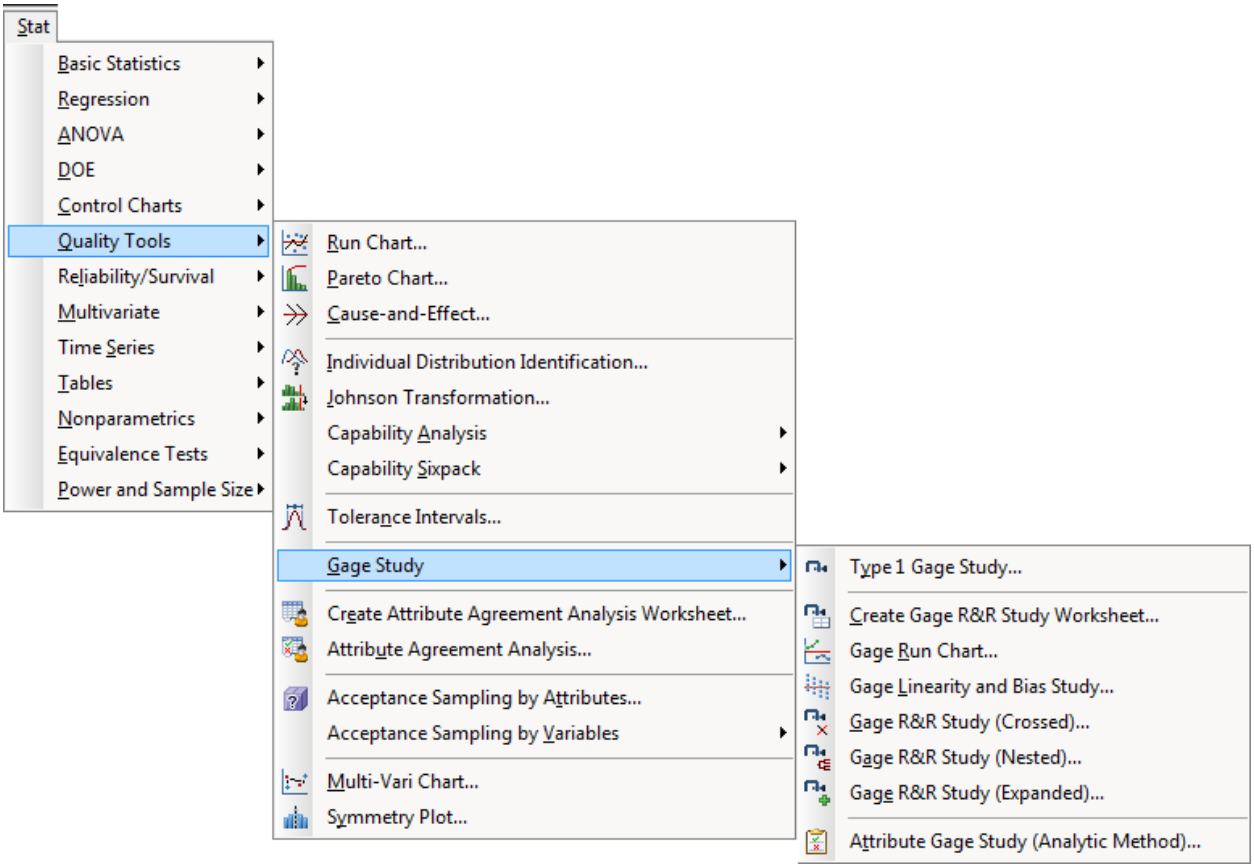
Runs about median



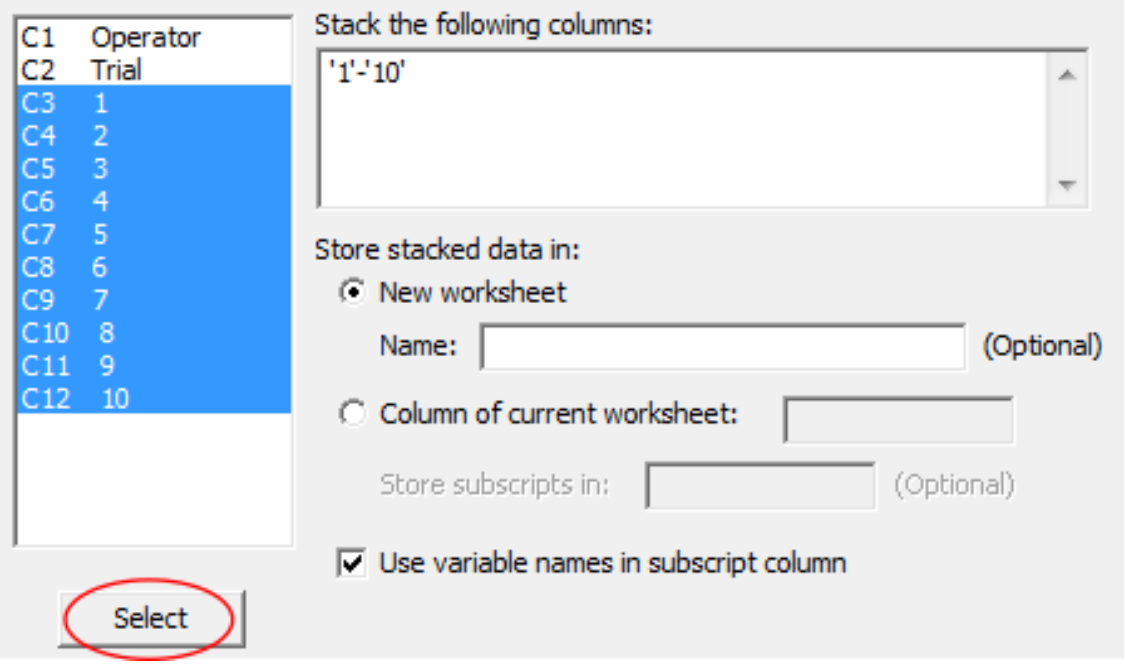
Runs up or down

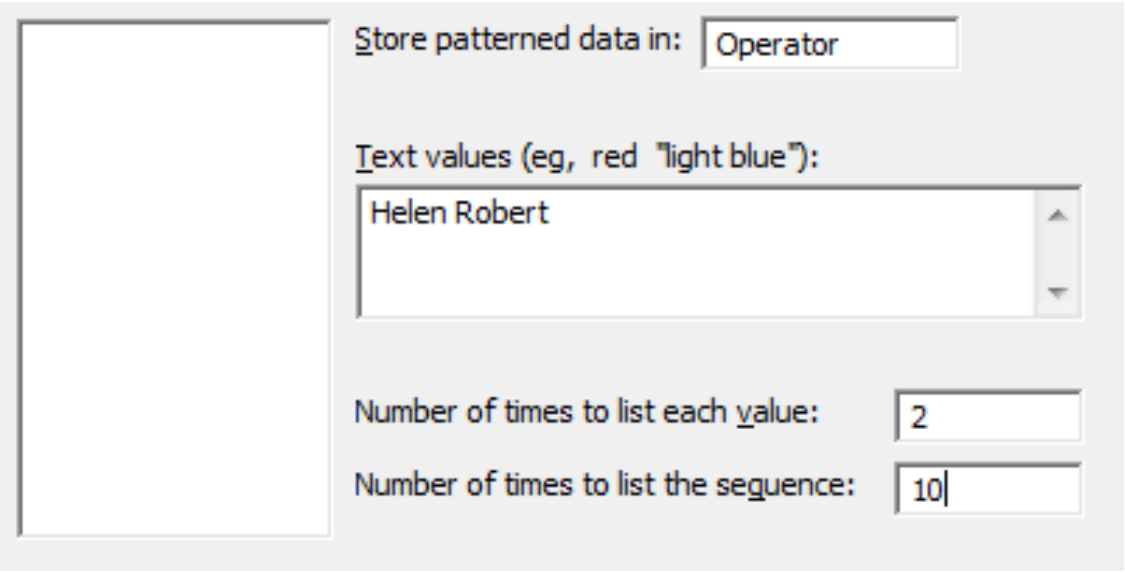


Chapter 8, Measurement Systems Analysis



		Part					
	Trial	1	2	3	4	5	6
Operator A	1						
	2						
	Means						
	Range						
Operator B	1						
	2						
	Means						
	Range						

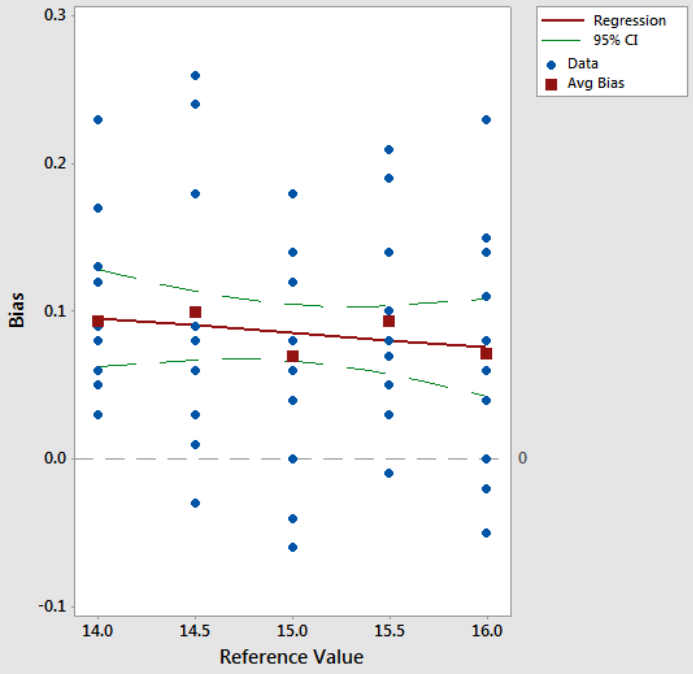

C1 Operator
C2 Trial
C3 1
C4 2
C5 3
C6 4
C7 5
C8 6
C9 7
C10 8
C11 9
C12 10
Stack the following columns:
'1'-'10'
Store stacked data in:
New worksheet
Name:
(Optional)
Column of current worksheet:
Store subscripts in:
(Optional)
Use variable names in subscript column
Select


Store patterned data in: Operator
Text values (eg, red "light blue"):
Helen Robert
Number of times to list each value: 2
Number of times to list the sequence: 10

Gage Linearity and Bias Report for Result

Gage name:
Date of study:

Reported by:
Tolerance:
Misc:



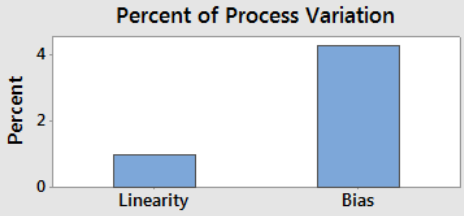
Gage Linearity

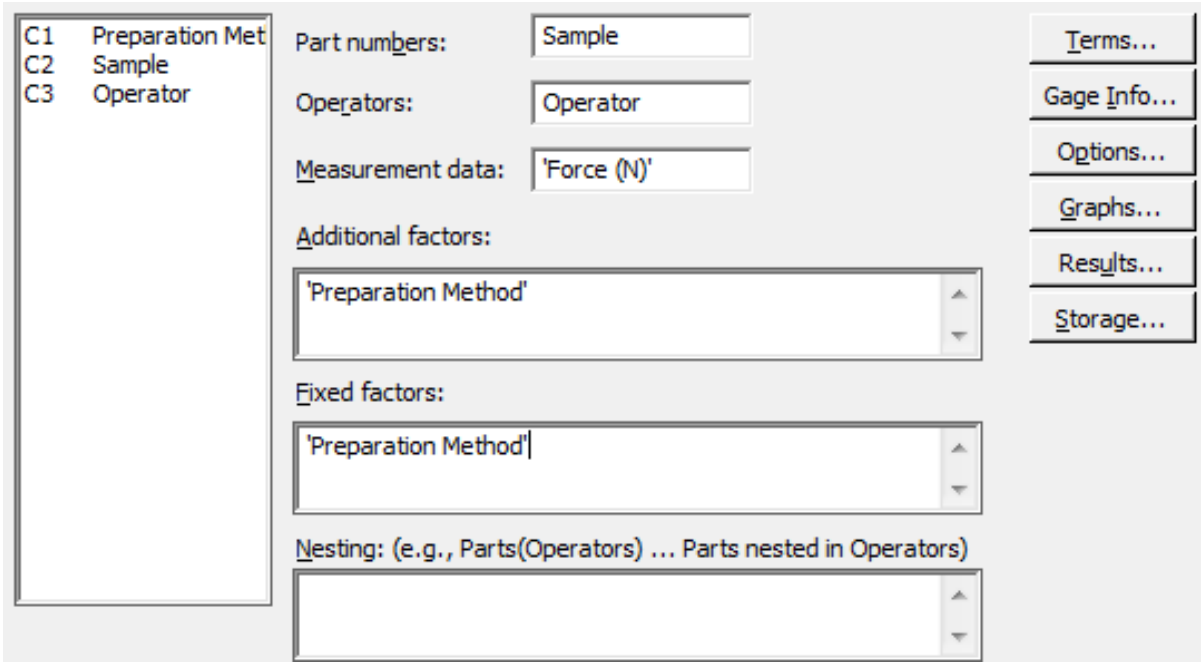
Predictor	Coef	SE Coef	P
Constant	0.2330	0.2026	0.255
Slope	-0.00983	0.01349	0.469

S	0.0739040	R-Sq	0.9%
Linearity	0.0196667	%Linearity	1.0

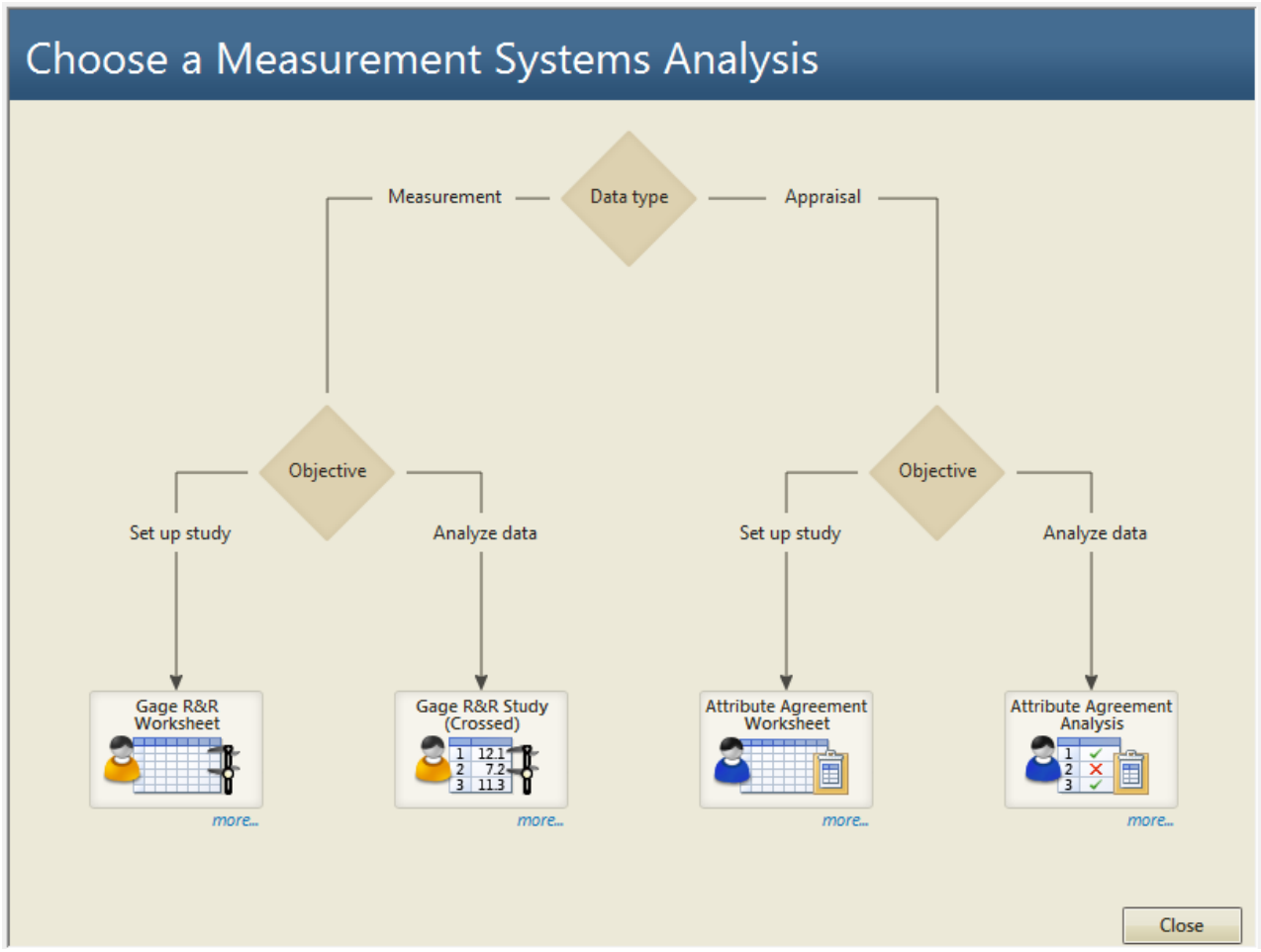
Gage Bias

Reference	Bias	%Bias	P
Average	0.0855000	4.3	0.000
14	0.0933333	4.7	0.000
14.5	0.0991667	5.0	0.003
15	0.0700000	3.5	0.008
15.5	0.0933333	4.7	0.001
16	0.0716667	3.6	0.016

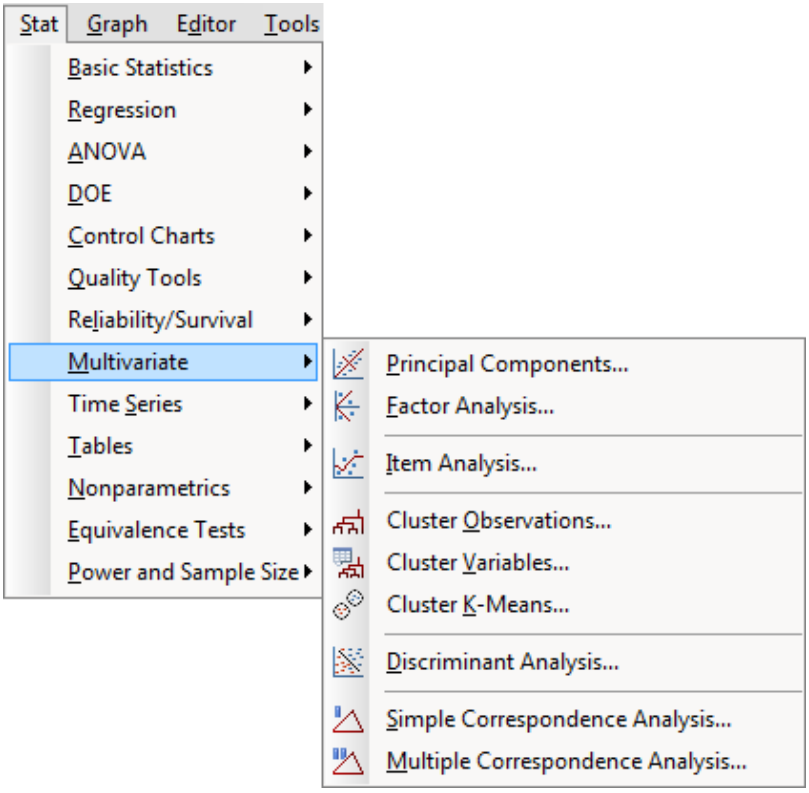




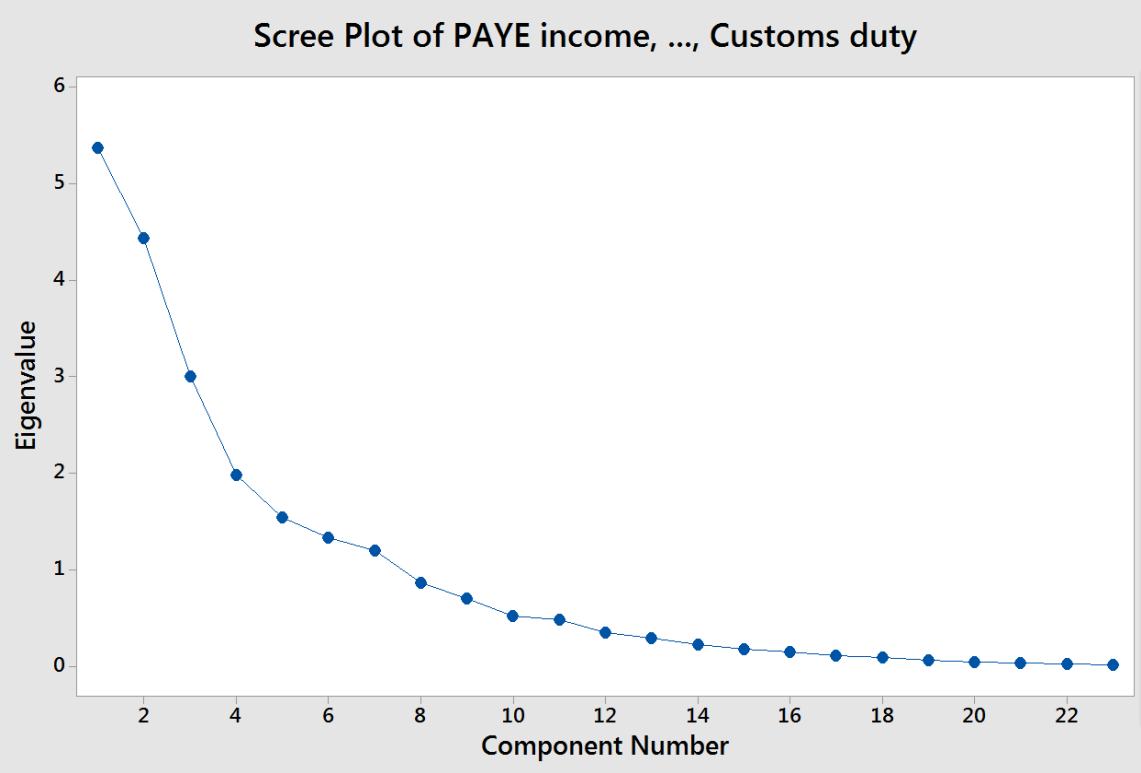
C1	C2	C3	C4
Part	Reference	Accepted	Trials
1	0.2500	20	20
2	0.2505	19	20
3	0.2510	16	20
4	0.2515	11	20
5	0.2520	5	20
6	0.2525	4	20
7	0.2530	1	20
8	0.2535	0	20

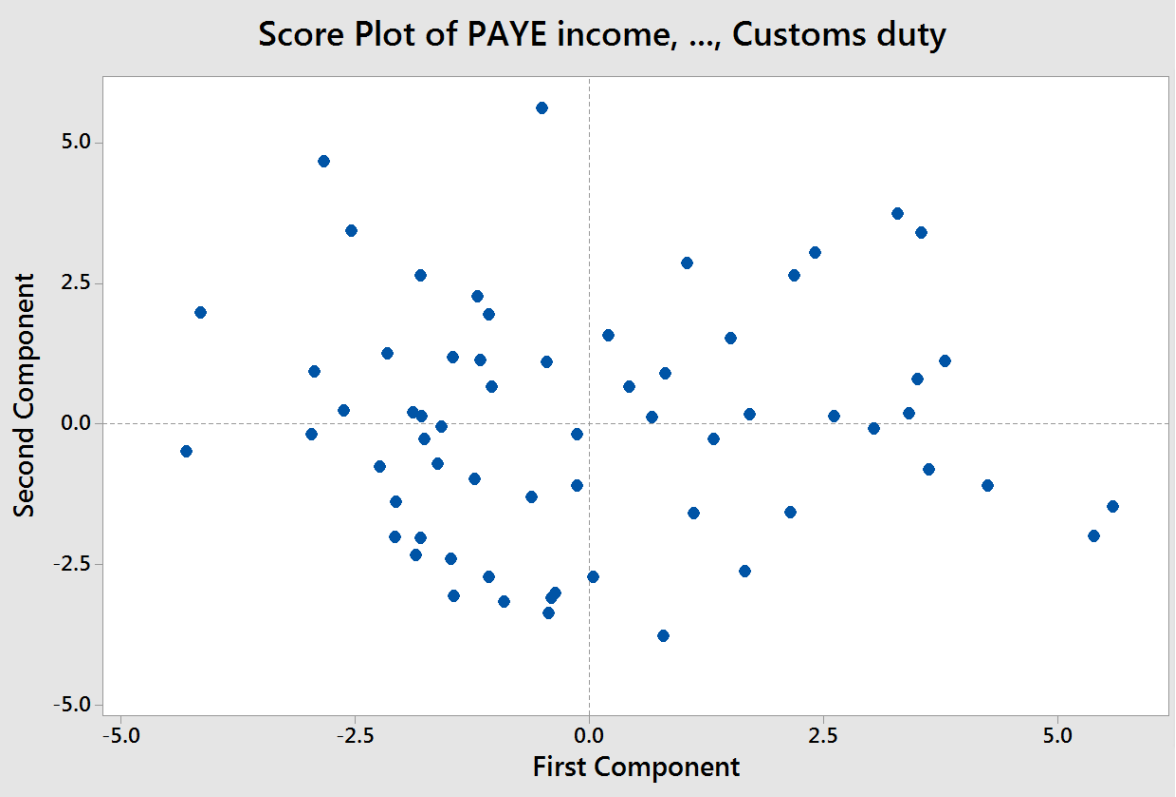


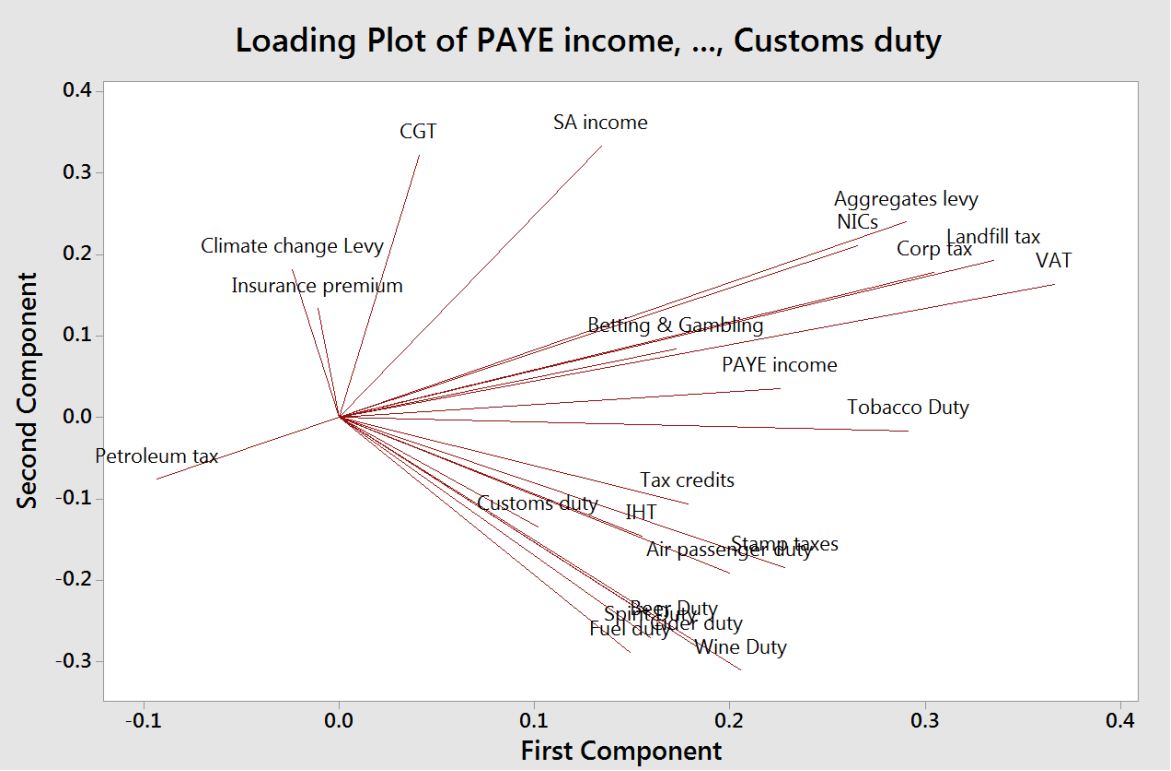
Chapter 9, Multivariate Statistics



Variable	PC1	PC2
PAYE income	0.226	0.036
SA income	0.134	0.333
CGT	0.041	0.322
Tax credits	0.179	-0.106
NICs	0.266	0.212
VAT	0.366	0.163
Corp tax	0.305	0.178
Petroleum tax	-0.093	-0.076
Fuel duty	0.149	-0.288
IHT	0.155	-0.145
Stamp taxes	0.228	-0.184
Tobacco Duty	0.291	-0.017
Spirit Duty	0.159	-0.270
Beer Duty	0.171	-0.263
Wine Duty	0.206	-0.310
Cider duty	0.183	-0.282
Betting & Gambling	0.173	0.085
Air passenger duty	0.200	-0.191
Insurance premium	-0.011	0.134
Landfill tax	0.335	0.193
Climate change Levy	-0.024	0.182
Aggregates levy	0.291	0.240
Customs duty	0.102	-0.134


Scree Plot of PAYE income, ..., Customs duty
Eigenvalue
Component Number
0
1
2
3
4
5
6
2
4
6
8
10
12
14
16
18
20
22


Score Plot of PAYE income, ..., Customs duty
Second Component
First Component
5.0
2.5
0.0
-2.5
-5.0
-5.0
-2.5
0.0
2.5
5.0



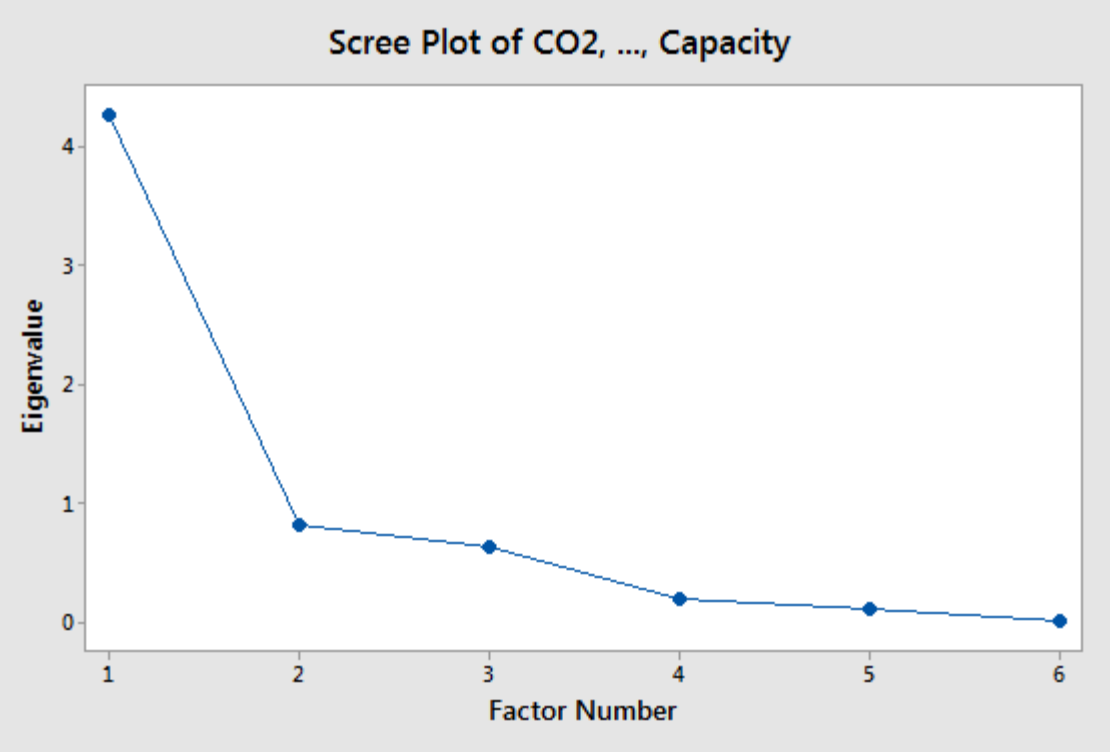
Principal Component Factor Analysis of the Correlation Matrix

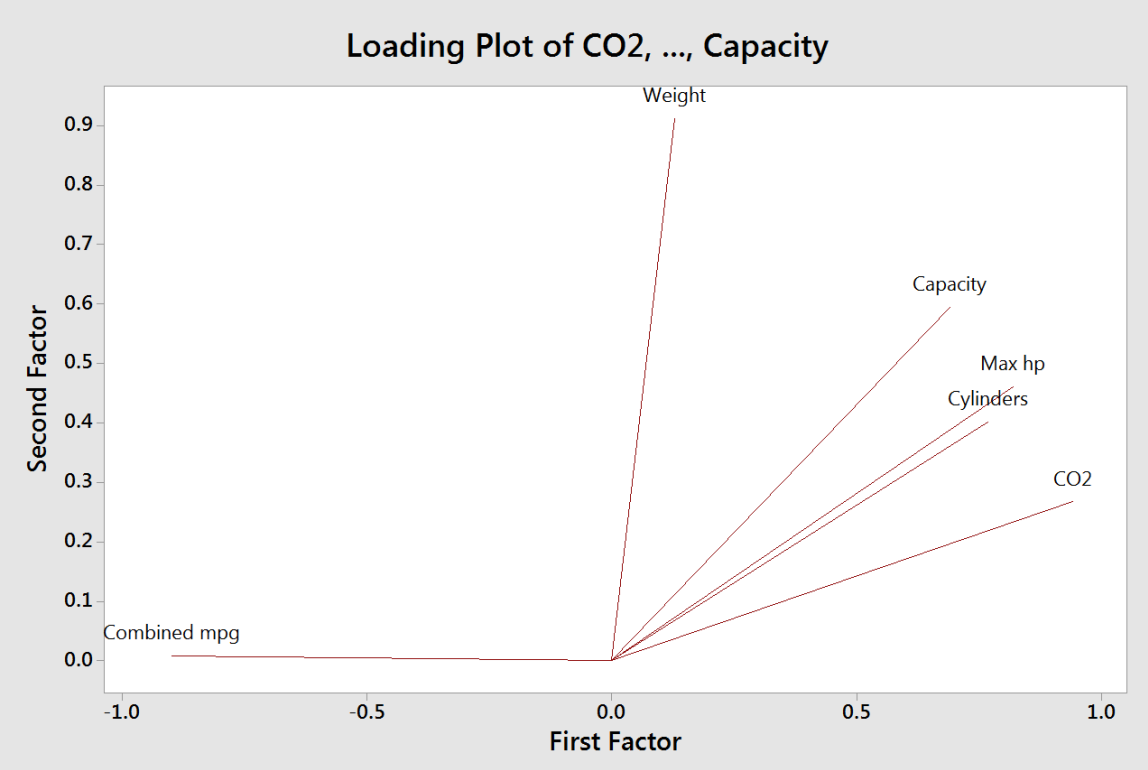
Unrotated Factor Loadings and Communalities

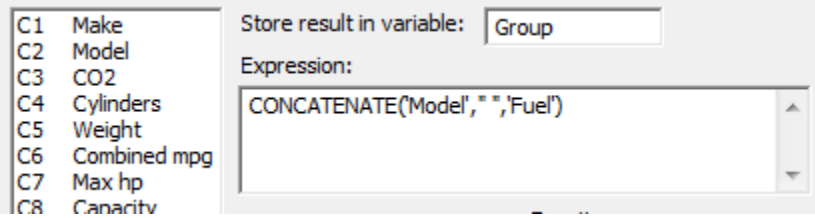
Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6	Communality
CO2	0.953	-0.223	-0.155	-0.032	0.103	0.072	1.000
Cylinders	0.866	-0.022	0.383	-0.306	-0.090	-0.008	1.000
Weight	0.555	0.735	-0.381	-0.078	-0.014	-0.002	1.000
Combined mpg	-0.781	0.442	0.435	0.036	-0.010	0.052	1.000
Max hp	0.941	0.005	0.078	0.255	-0.211	0.008	1.000
Capacity	0.892	0.185	0.330	0.143	0.200	-0.030	1.000
Variance	4.2583	0.8212	0.6209	0.1873	0.1033	0.0090	6.0000
% Var	0.710	0.137	0.103	0.031	0.017	0.002	1.000

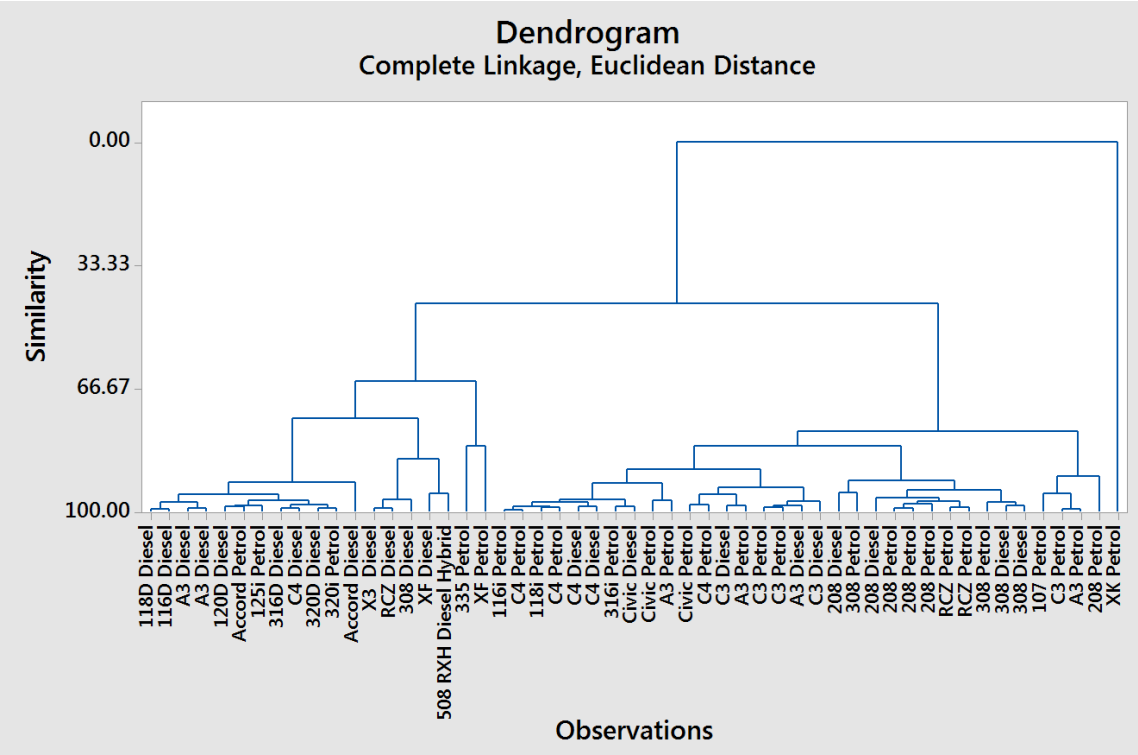
Factor Score Coefficients

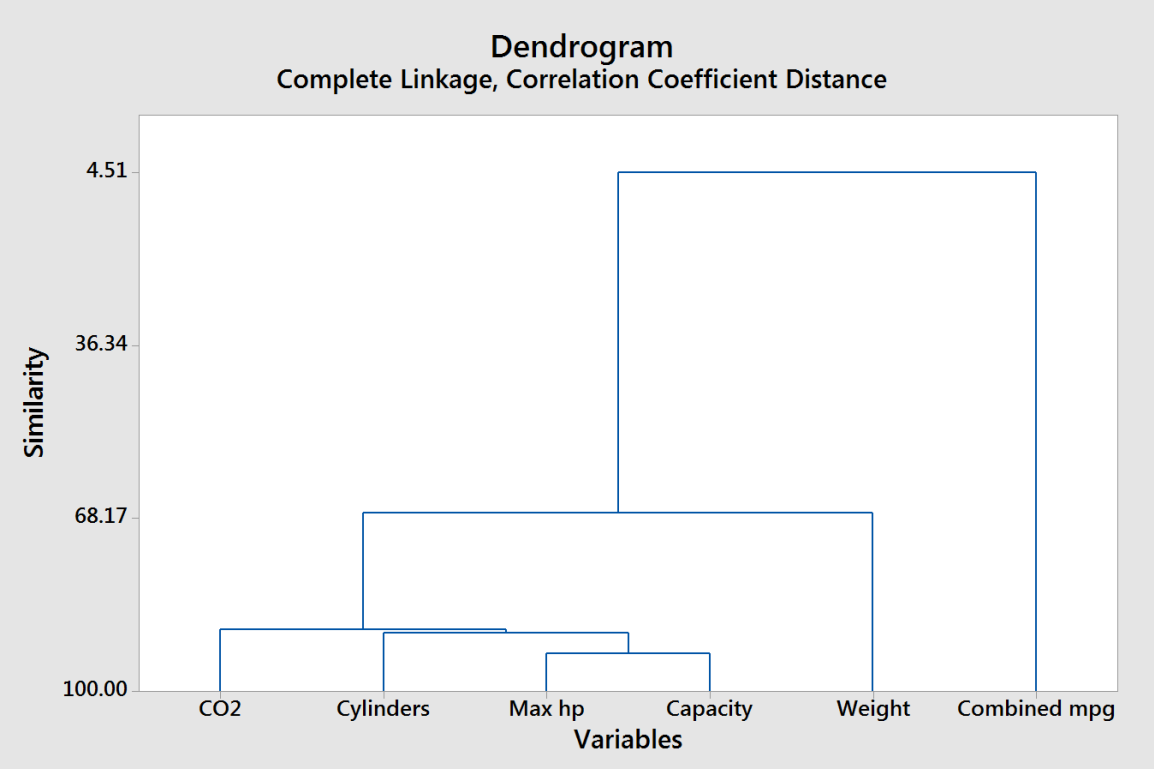
Variable	Factor1	Factor2	Factor3	Factor4	Factor5	Factor6
CO2	0.224	-0.272	-0.250	-0.170	1.000	8.015
Cylinders	0.203	-0.026	0.617	-1.634	-0.875	-0.914
Weight	0.130	0.896	-0.614	-0.416	-0.137	-0.257
Combined mpg	-0.183	0.539	0.701	0.192	-0.094	5.822
Max hp	0.221	0.006	0.125	1.359	-2.038	0.890
Capacity	0.209	0.225	0.532	0.762	1.932	-3.358

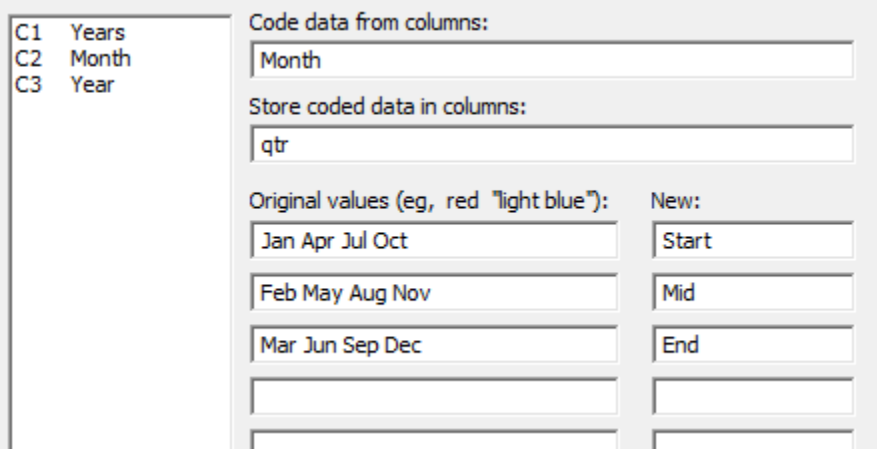

Scree Plot of CO2, ..., Capacity
Eigenvalue
Factor Number
0
1
2
3
4
1
2
3
4
5
6

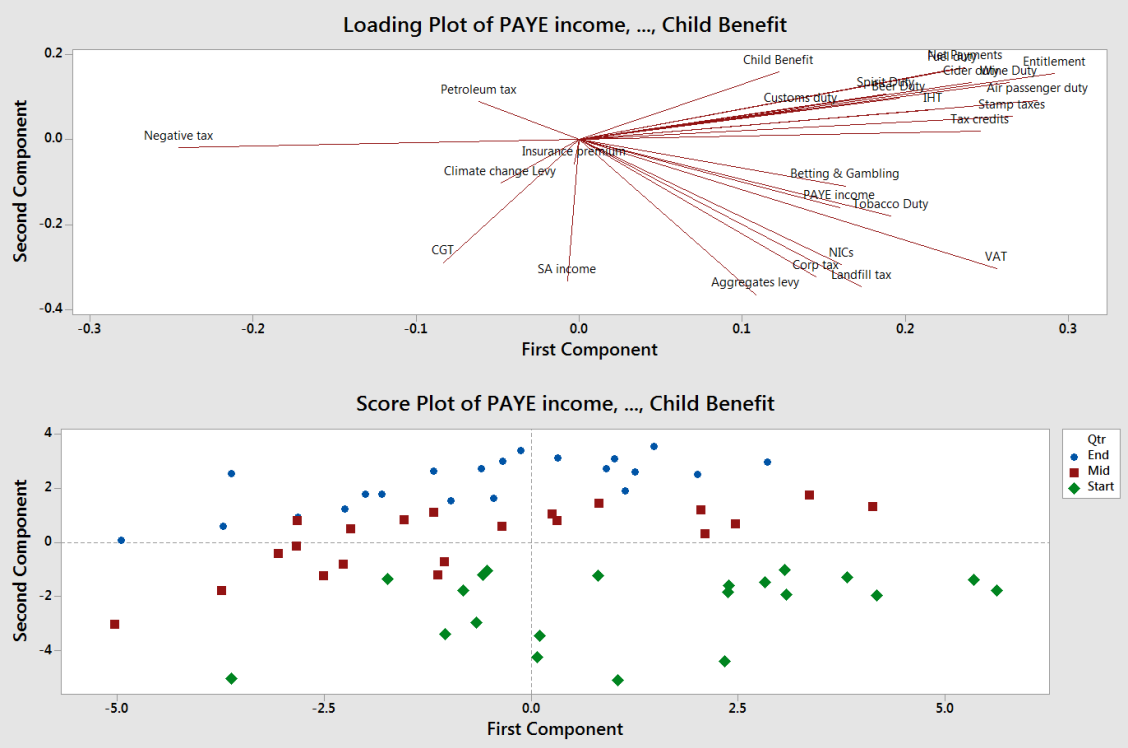

Loading Plot of CO2, ..., Capacity
Second Factor
First Factor
Weight
Capacity
Max hp
Cylinders
CO2
Combined mpg
0.0
0.1
0.2
0.3
0.4
0.5
0.6
0.7
0.8
0.9
-1.0
-0.5
0.0
0.5
1.0


C1 Make
C2 Model
C3 CO2
C4 Cylinders
C5 Weight
C6 Combined mpg
C7 Max hp
C8 Capacity
Store result in variable: Group
Expression:
CONCATENATE('Model'," ",'Fuel')


Dendrogram
Complete Linkage, Euclidean Distance
Similarity
0.00
33.33
66.67
100.00
118D Diesel
116D Diesel
A3 Diesel
A3 Diesel
120D Diesel
Accord Petrol
125i Petrol
316D Diesel
C4 Diesel
320D Diesel
320i Petrol
Accord Diesel
X3
RCZ Diesel
308 Diesel
XF Diesel
508 RXH Diesel Hybrid
335 Petrol
XF Petrol
116i Petrol
C4 Petrol
118i Petrol
C4 Petrol
C4 Diesel
C4 Diesel
316i Petrol
Civic Diesel
Civic Petrol
A3 Petrol
Civic Petrol
C4 Petrol
C3 Diesel
A3 Petrol
C3 Petrol
C3 Petrol
A3 Diesel
A3 Diesel
C3 Diesel
208 Diesel
308 Petrol
208 Diesel
208 Petrol
208 Petrol
208 Petrol
RCZ Petrol
RCZ Petrol
308 Petrol
308 Diesel
308 Diesel
107 Petrol
C3 Petrol
A3 Petrol
208 Petrol
XK Petrol
Observations


Dendrogram
Complete Linkage, Correlation Coefficient Distance
Similarity
4.51
36.34
68.17
100.00
CO2
Cylinders
Max hp
Capacity
Weight
Combined mpg
Variables


C1 Years
C2 Month
C3 Year
Code data from columns:
Month
Store coded data in columns:
qtr
Original values (eg, red "light blue"):
New:
Jan Apr Jul Oct
Start
Feb May Aug Nov
Mid
Mar Jun Sep Dec
End



C1-T	C2-T	C3	C4	C5	C6	C7-T	C8	C9	C10
Battle	Combatant	Troops	Tanks	Aircraft	Losses	Outcome	Opposing Troops	Opposing Tanks	Opposing Aircraft
Stalingrad	Axis	1040000	500	732	850000	Loss	1143000	2400	1115
Stalingrad	Allies	1143000	2400	1115	1120000	Win	1040000	500	732
Kursk	Axis	912460	2928	2110	54182	Loss	1910361	5128	3000
Kursk	Allies	1910361	5128	3000	177847	Win	912460	2928	2110
Monte Cassino	Axis	140000	*	*	20000	Loss	240000	1900	4000
Monte Cassino	Allies	240000	1900	4000	55000	Win	140000	*	*
Battle of the Bulge	Axis	300000	440	2400	100000	Loss	665000	1616	6000
Battle of the Bulge	Allies	665000	1616	6000	90900	Win	300000	440	2400
El Alamein, Egypt I	Axis	96000	70	500	10000	Loss	150000	179	1500
El Alamein, Egypt I	Allies	150000	179	1500	13250	Win	96000	70	500
El Alamein, Egypt II	Axis	116000	547	480	30542	Loss	195000	1029	530
El Alamein, Egypt II	Allies	195000	1029	530	13560	Win	116000	547	480
Normandy	Axis	380000	0	*	209875	Loss	1452000	0	*
Normandy	Allies	1452000	0	*	226386	Win	380000	0	*
Battle of France	Axis	3350000	2445	5638	163650	Win	3300000	3383	2935
Battle of France	Allies	3300000	3383	2935	2260000	Loss	3350000	2445	5638
Battle of the Netherlands	Axis	750000	759	830	11000	Win	280000	1	145
Battle of the Netherlands	Allies	280000	1	145	11600	Loss	750000	759	830

Summary of classification

	True Group	
Put into Group	Loss	Win
Loss	7	2
Win	0	5
Total N	7	7
N correct	7	5
Proportion	1.000	0.714

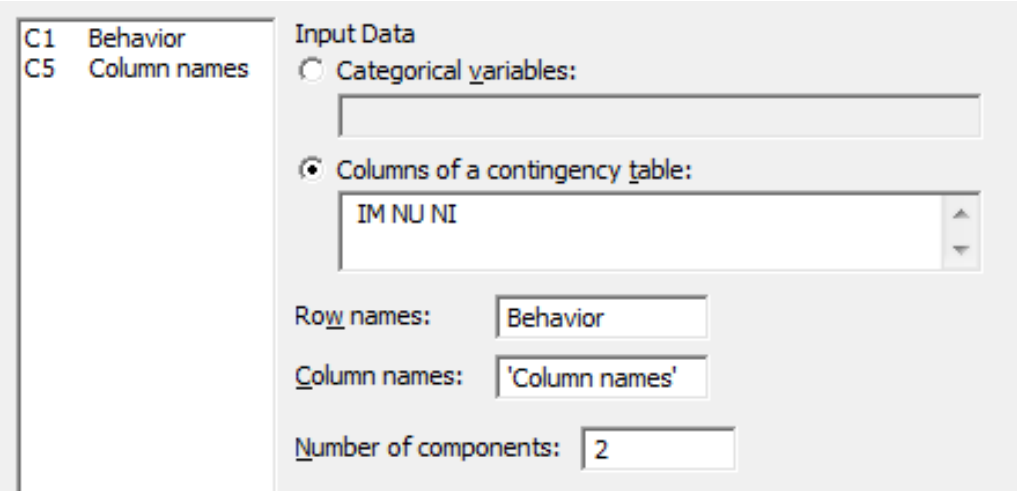
N = 14 N Correct = 12 Proportion Correct = 0.857

Linear Discriminant Function for Groups

	Loss	Win
Constant	-1.549	-10.158
Troop Ratio	4.899	12.451
Tank Ratio	-0.007	-0.015

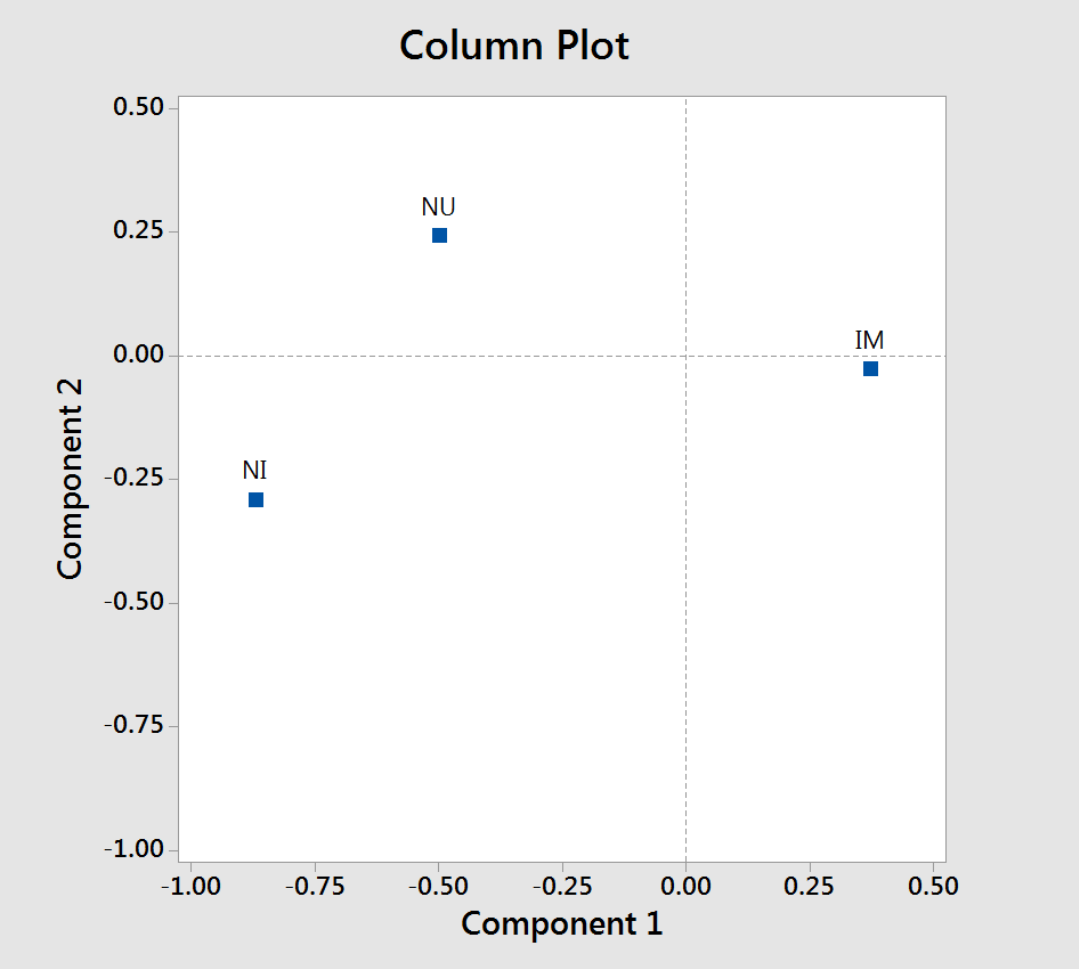
$$Loss = -1.549 + 4.899 * Troop\ Ratio - 0.007 * Tank\ Ratio$$

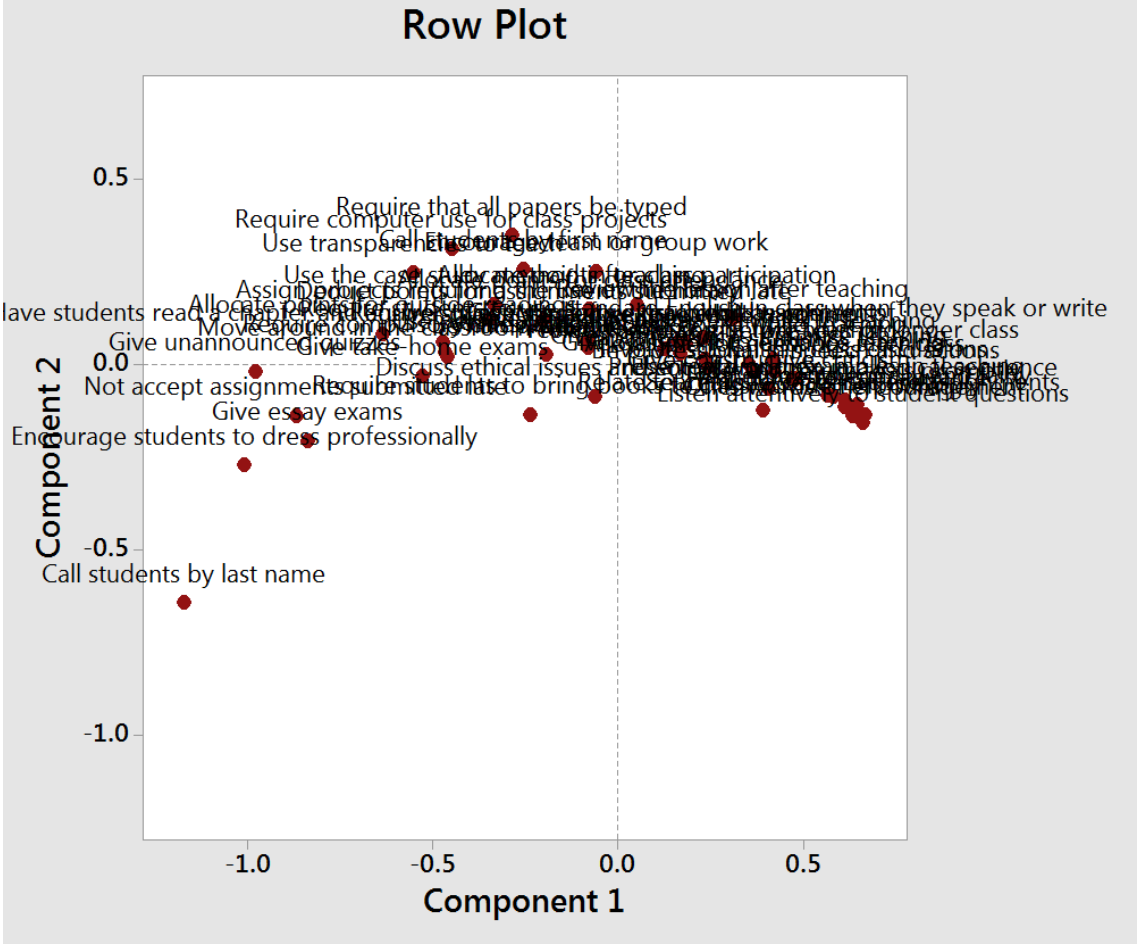
$$Win = -10.158 + 12.451 * Troop\ Ratio - 0.015 * Tank\ Ratio$$



Analysis of Contingency Table

Axis	Inertia	Proportion	Cumulative	Histogram
1	0.2495	0.9065	0.9065	**********
2	0.0257	0.0935	1.0000	***
Total	0.2752			





Column name	Dress Casually
IM	56
NU	450
NI	229

Gender	Count
boy	227
girl	251
N=	478

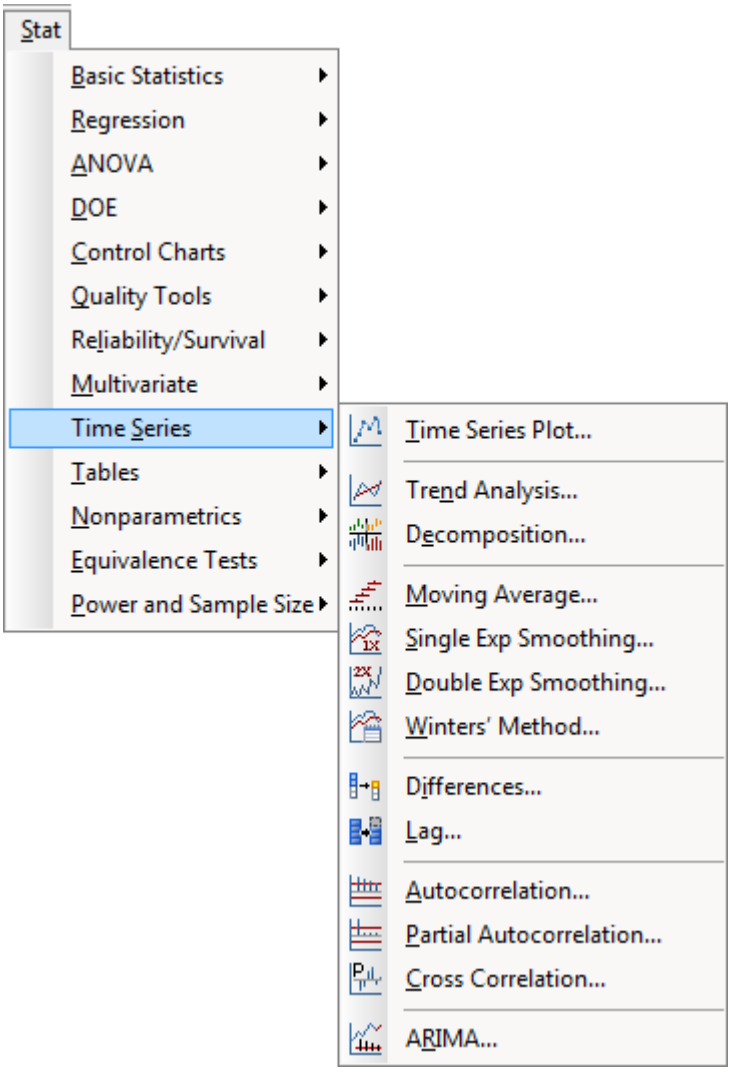
Urban/Rural	Count
Rural	149
Suburban	151
Urban	178
N=	478

Goals	Count
Grades	247
Popular	141
Sports	90
N=	478

Gender	Urban/Rural	Goals	Categories
boy	Rural	Sports	Boy
boy	Rural	Popular	Girl
girl	Rural	Popular	Rural
girl	Rural	Popular	Suburban
girl	Rural	Popular	Urban
girl	Rural	Popular	Grades
girl	Rural	Popular	Popular
girl	Rural	Grades	Sport
girl	Rural	Sports	
girl	Rural	Sports	
girl	Rural	Sports	

boy/Rural
boy/suburban
boy/urban
girl/rural
girl/suburban
girl/urban

Chapter 10, Time Series Analysis



$$Y_t = L_{t-1} + T_{t-1}$$

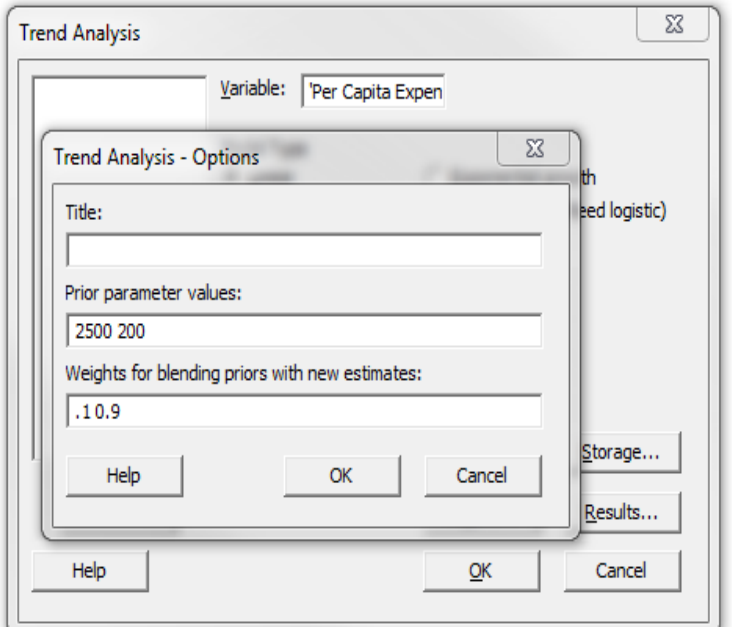
$$L_t = \propto Y_t + (1 - \propto)(L_{t-1} + T_{t-1})$$

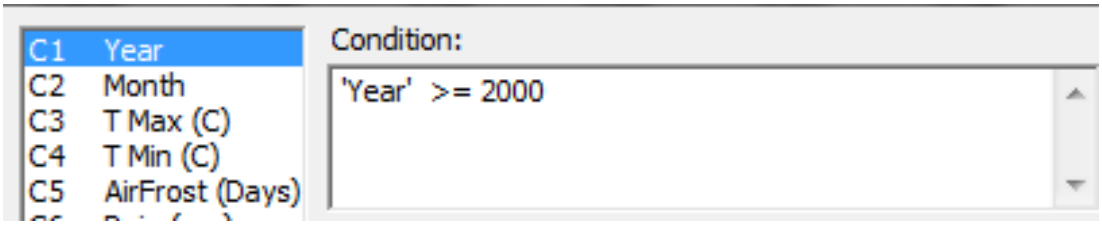
$$T_t = \gamma (L_t - L_{t-1}) + (1 - \gamma) T_{t-1}$$

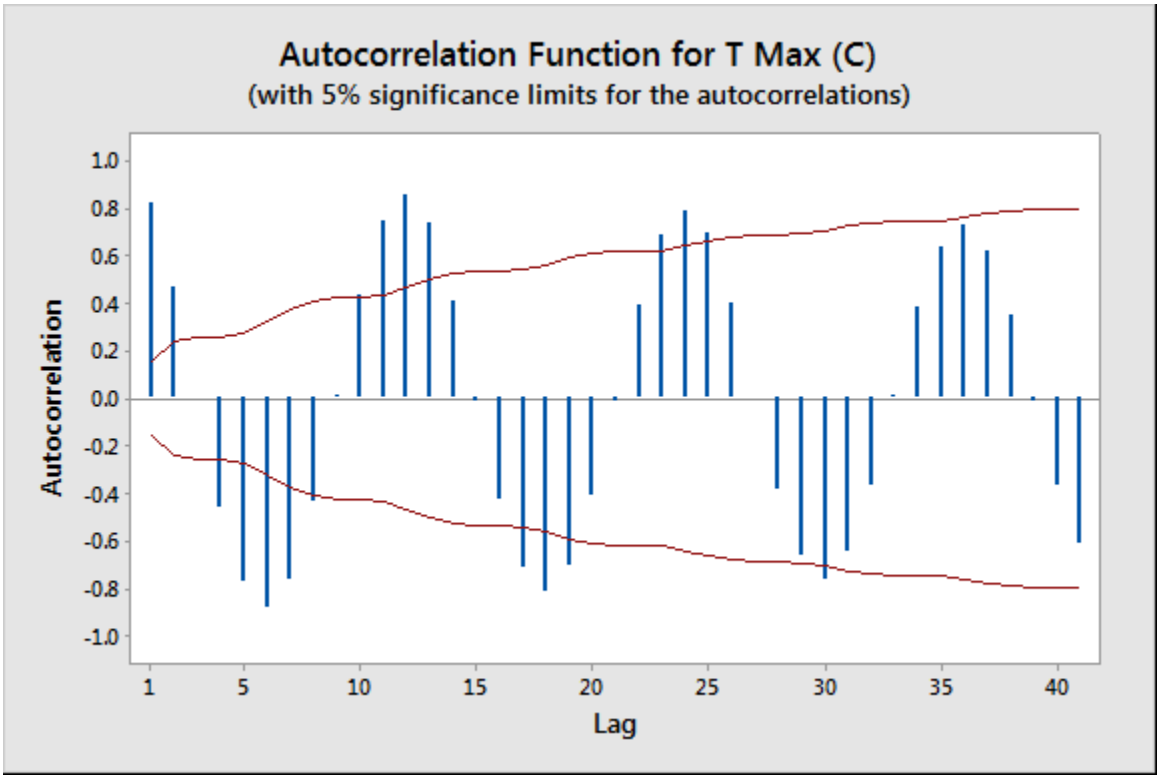
Trend Analysis - Comparison for Value (%)

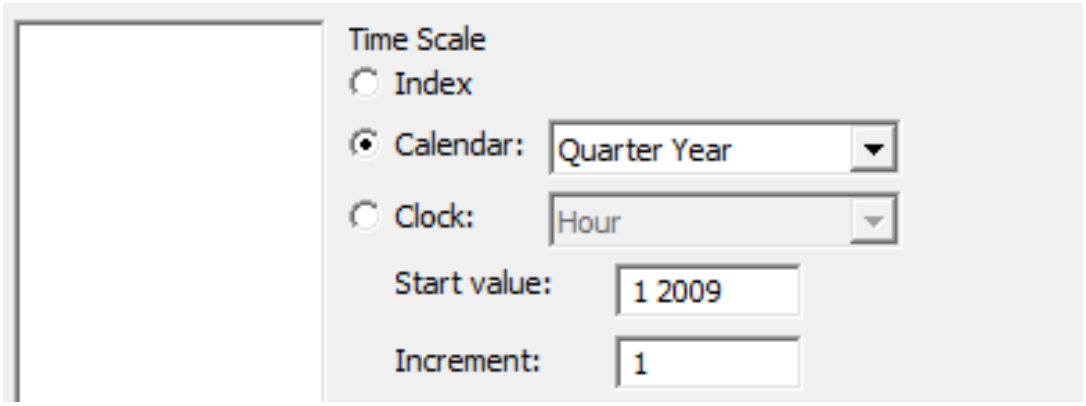
Trend Analysis for Per Capita Expenditure

```
Data      Per Capita Expenditure
Length    16
NMissing  0


Fitted Trend Equation

Yt = 3025 + 329*t


Comparisons between trend lines

      New Line  Prior Line  Smoothed Line
B0      3024.9        2500           2552
B1       329.1         200            316
MAPE       2.9          27             10
MAD      138.9        1623            582
MSD    32079.3     3019630         374591
```






Autocorrelation Function for T Max (C)
(with 5% significance limits for the autocorrelations)
Autocorrelation
1.0
0.8
0.6
0.4
0.2
0.0
-0.2
-0.4
-0.6
-0.8
-1.0
1
5
10
15
20
25
30
35
40
Lag


Time Scale
Index
Calendar:
Quarter Year
Clock:
Hour
Start value:
1 2009
Increment:
1

Chapter 11, Macro Writing

```
PPlot 'Data';
 Normal;
 Symbol;
 FitD;
 Grid 2;
 Grid 1;
 MGrid 1.
TSPlot 'Data';
 Symbol;
 Connect.
Histogram 'Data';
 Bar;
 Distribution;
  Normal.
OneT 'Data';
 Test 10;
 Confidence 95.0;
 Alternative 0.
OneVariance 'Data';
 STest 2;
 Confidence 95.0;
 Alternative 0.
```

```
GMACRO
GLAYOUT

PPlot 'Data';
  Normal;
  Symbol;
  FitD;
  Grid 2;
  Grid 1;
  MGrid 1.

TSPlot 'Data';
  Symbol;
  Connect.

Histogram 'Data';
  Bar;
  Distribution;
    Normal.

Onet 'Data';
  Test 10.

OneVariance 'Data';
  STest 2;
  Confidence 95.0;
  Alternative 0.

ENDMACRO



Tsplot Data;
  Index;
  Connect;
  Symbol;
  Reference 2 12.5;
    Type 2;
    Color 28;
    Size 2;
    MODEL 1;
    Label "USL";
  Title;
  Footnote;
    FPanel;
  NoDTitle.
```

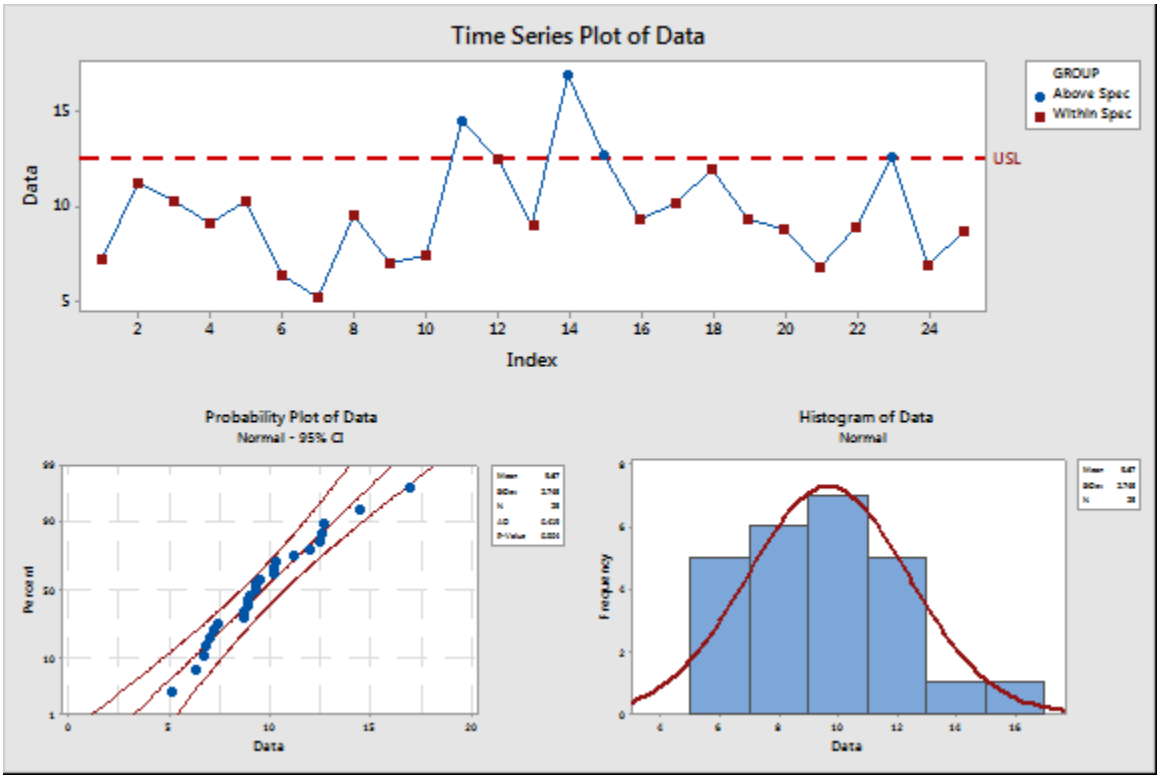
```
GMACRO
GLAYOUT

LAYOUT

PPlot 'Data';
  FIGURE 0 0.5 0 0.5;
  Normal;
  Symbol;
  FitD;
  Grid 2;
  Grid 1;
  MGrid 1.

Tsplot Data;
  Index;
  Connect;
  FIGURE 0 1 0.5 1;
  Symbol;
  Reference 2 12.5;
    Type 2;
    Color 2;
    Size 2;
    MODEL 1;
    Label "USL";
  Title;
  Footnote;
    FPanel;
  NoDTitle.

Histogram 'Data';
  Bar;
  FIGURE 0.5 1 0 0.5;
  Distribution;
    Normal.

ENDLAYOUT

OneT 'Data';
  Test 10;
  Confidence 95.0;
  Alternative 0.

OneVariance 'Data';
  STest 2;
  Confidence 95.0;
  Alternative 0.

ENDMACRO
```

```
Tsplot Data;
  Index;
  Connect;
  FIGURE 0 1 0.5 1;
  Symbol;
  Reference 2 12.5;
    Type 2;
    Color 28;
    Size 2;
    MODEL 1;
    Label "USL";
  Title;
  Footnote;
    FPanel;
  NoDTitle.


GMACRO
GSESSION

Note ---------------------------
Note Enter a Specification Limit
Note ---------------------------

#Read a single value into column 100
SET C100;
  FILE "TERMINAL";
  NOBS 1.

#Copy the value in C100 into constant K1
Let K1 = c100

#Delete column 100
ERASE C100

#Create a new column called group to identify results outside of specification
NAME C2 "Group"
LET C2 = IF(DATA > K1, "Above Spec", "Within Spec")

LAYOUT
```

```
Tsplot Data;
 Index;
 Connect;
 FIGURE 0 1 0.5 1;
 Legend;
  Section 1;
 Symbol Group;
 Reference 2 k1;
  Type 2;
  Color 28;
  Size 2;
  MODEL 1;
  Label "USL";
 Title;
 Footnote;
  FPanel;
 NoDTitle.
```

```
MACRO
LLayout COL Spec

MCOLUMN GROUP
MCONSTANT SPEC

LET C2 = IF(DATA > K1, "Above Spec", "Within Spec")

LAYOUT
```

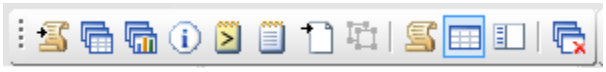
```
MACRO
LLayout Col Spec

MColumn Col Group
MConstant Spec

#Identify results outside of specification for column Group

Let Group = if(Col > Spec, "Above Spec", "Within Spec")

LAYOUT

PPlot Col;
  FIGURE 0 0.5 0 0.5;
  Normal;
  Symbol;
  FitD;
  Grid 2;
  Grid 1;
  MGrid 1.

Tsplot Col;
  Index;
  Connect;
  FIGURE 0 1 0.5 1;
  Legend;
   Section 1;
  Symbol Group;
  Reference 2 Spec;
    Type 2;
    Color 28;
    Size 2;
    MODEL 1;
    Label "USL";
  Title;
  Footnote;
    FPanel;
  NoDTitle.

Histogram Col;
  Bar;
  FIGURE 0.5 1 0 0.5;
  Distribution;
    Normal.

ENDLAYOUT

ENDMACRO
```

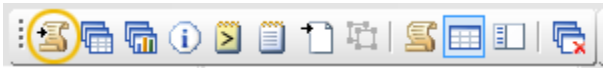


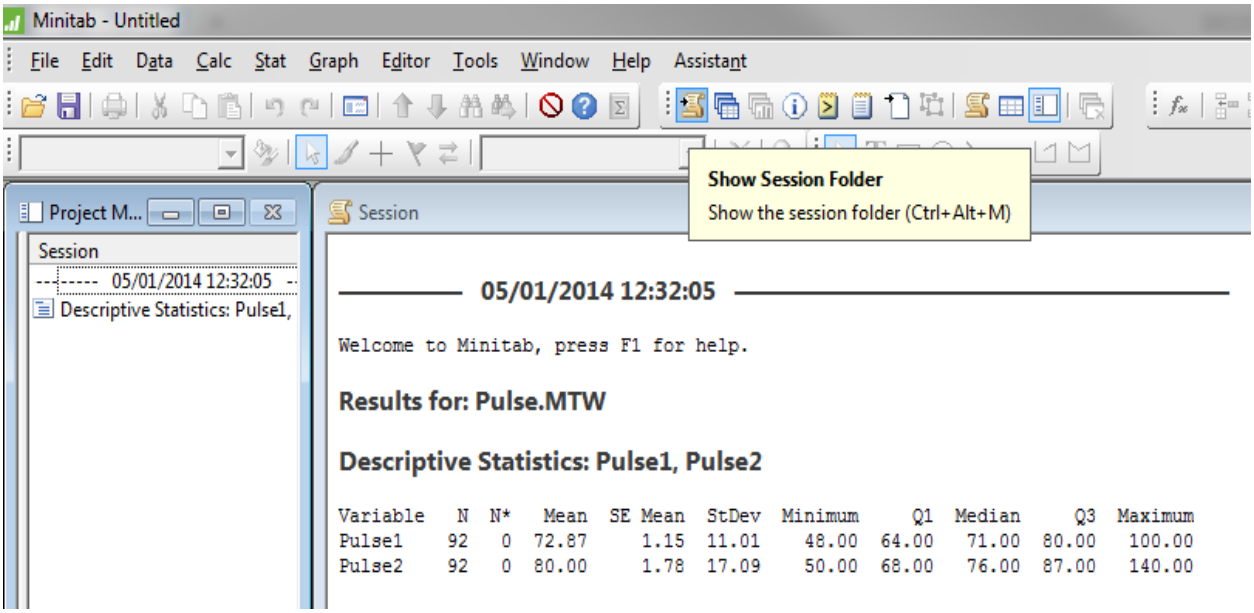

```
MACRO
LSUB Col.1-Col.N;
 Specs SPC.

#Define Variables
MColumn Col.1-Col.N Group
MConstant N LP VTYPE SND CNT
MFree SPC


# If statement checks to see if specifications have been used.

IF Specs = 1  #specifications are used
  MTYPE SPC VTyPE  #Check variable type of the spec

  IF VTYPE = 1  #Spec Variable is type 1, a constant. Create charts with single spec

    DO LP = 1:N
      Call Llayout Col.N SPC
    ENDDO
```

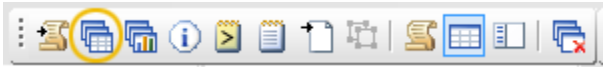
```
  ELSEIF VTYPE = 2  #Spec Variable is type 2, column. Create charts with seperate spec

#Count number of specifications
    Let CNT = Count(SPC)

    IF CNT NE N  #If the number of specifications does not equal Columns, exit macro.
      NOTE ----------------------------------------------
      NOTE Number of specifications does not equal columns
      NOTE Macro Exiting
      NOTE ----------------------------------------------
      EXIT
    ENDIF

#Call the Layout without limit if a missing value is entered as the spec
#Or call the layout with specifications

    DO LP = 1:N
      IF SPC[LP] = miss()
        Call NOSPEC COL.N
      Else
        LET SND = SPC[LP]
        Call Llayout COL.LP SND
      ENDIF
    ENDDO

  ENDIF



#When the Specification subcommand isnt used, create charts without the spec line
ELSE
  DO LP = 1:N
    Call NOSPEC COL.N
  ENDDO
ENDIF

ENDMACRO



MACRO
NOSPEC Col

MCOLUMN COL


Tsplot Col;
  Index;
  Connect;
  Symbol;
  FIGURE 0 1 0.5 1;
  Title;
  Footnote;
    FPanel;
  NoDTitle.
```

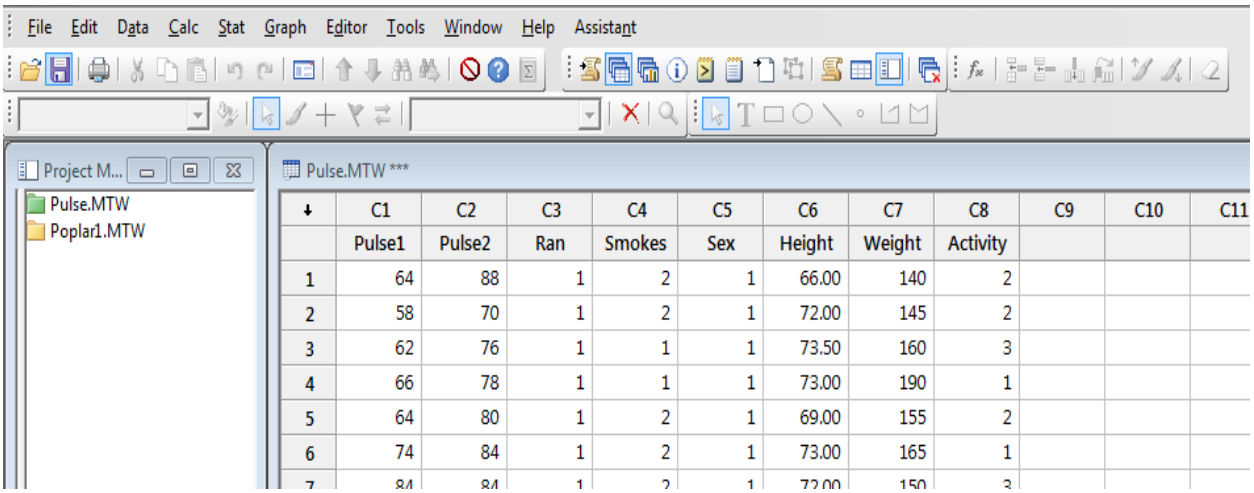
Appendix, Navigating Minitab and Useful Shortcuts



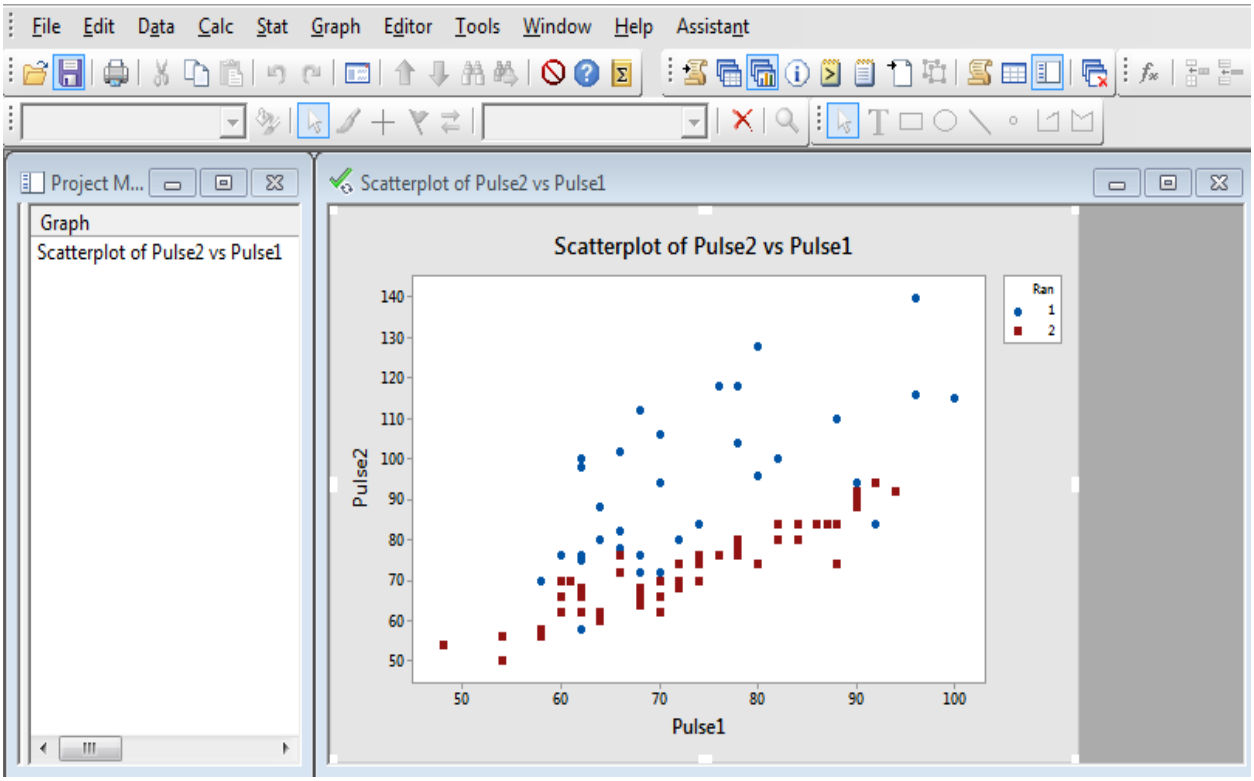


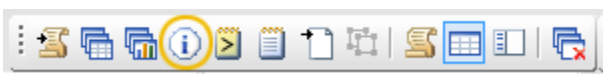


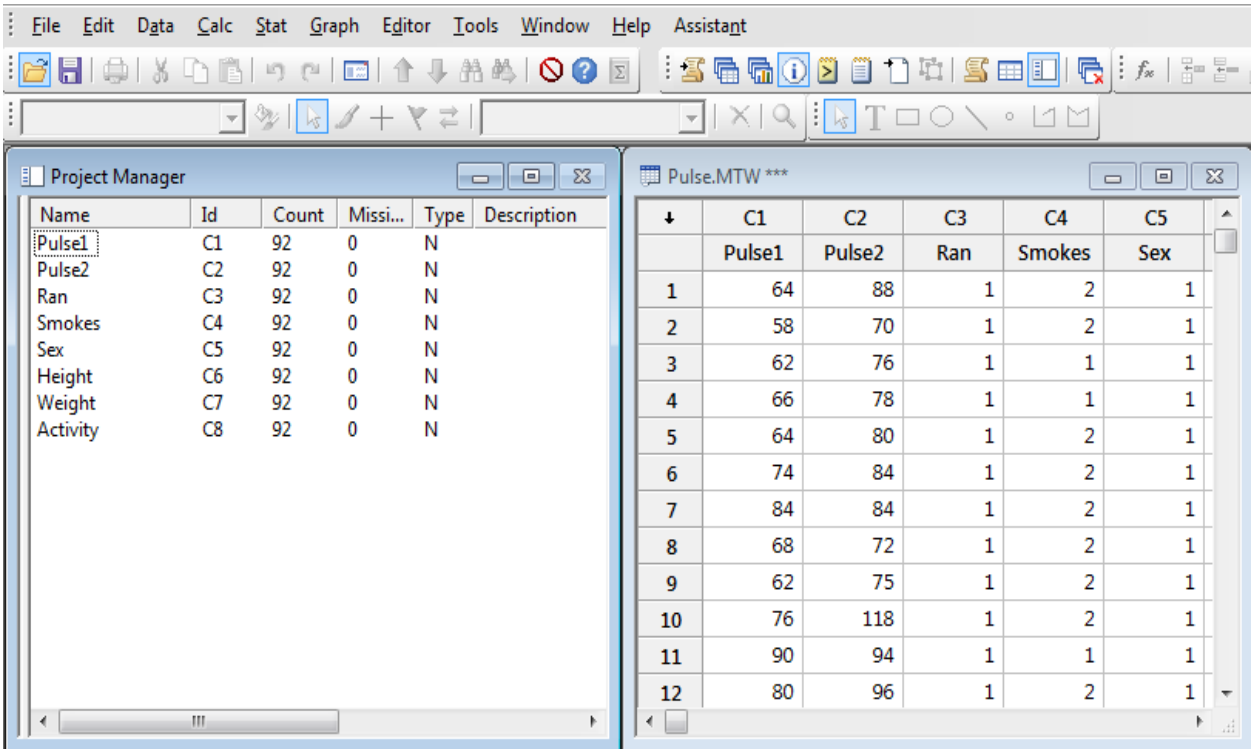




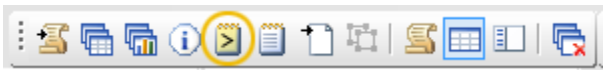
	C1	C2	C3	C4	C5	C6	C7	C8	C9	C10	C11
	Pulse1	Pulse2	Ran	Smokes	Sex	Height	Weight	Activity			
1	64	88	1	2	1	66.00	140	2			
2	58	70	1	2	1	72.00	145	2			
3	62	76	1	1	1	73.50	160	3			
4	66	78	1	1	1	73.00	190	1			
5	64	80	1	2	1	69.00	155	2			
6	74	84	1	2	1	73.00	165	1			

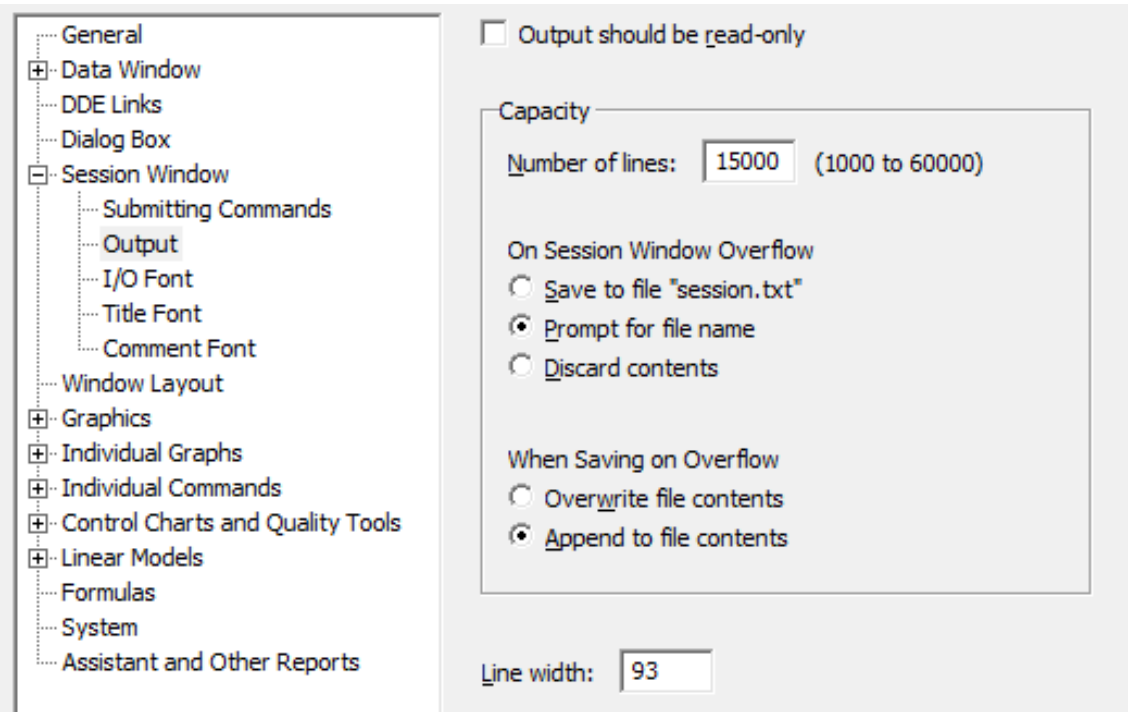






	C1	C2	C3	C4	C5
	Pulse1	Pulse2	Ran	Smokes	Sex
1	64	88	1	2	1
2	58	70	1	2	1
3	62	76	1	1	1
4	66	78	1	1	1
5	64	80	1	2	1
6	74	84	1	2	1
7	84	84	1	2	1
8	68	72	1	2	1
9	62	75	1	2	1
10	76	118	1	2	1
11	90	94	1	1	1
12	80	96	1	2	1




General
Data Window
DDE Links
Dialog Box
Session Window
Submitting Commands
Output
I/O Font
Title Font
Comment Font
Window Layout
Graphics
Individual Graphs
Individual Commands
Control Charts and Quality Tools
Linear Models
Formulas
System
Assistant and Other Reports
Output should be read-only
Capacity
Number of lines: 15000 (1000 to 60000)
On Session Window Overflow
Save to file "session.txt"
Prompt for file name
Discard contents
When Saving on Overflow
Overwrite file contents
Append to file contents
Line width: 93