

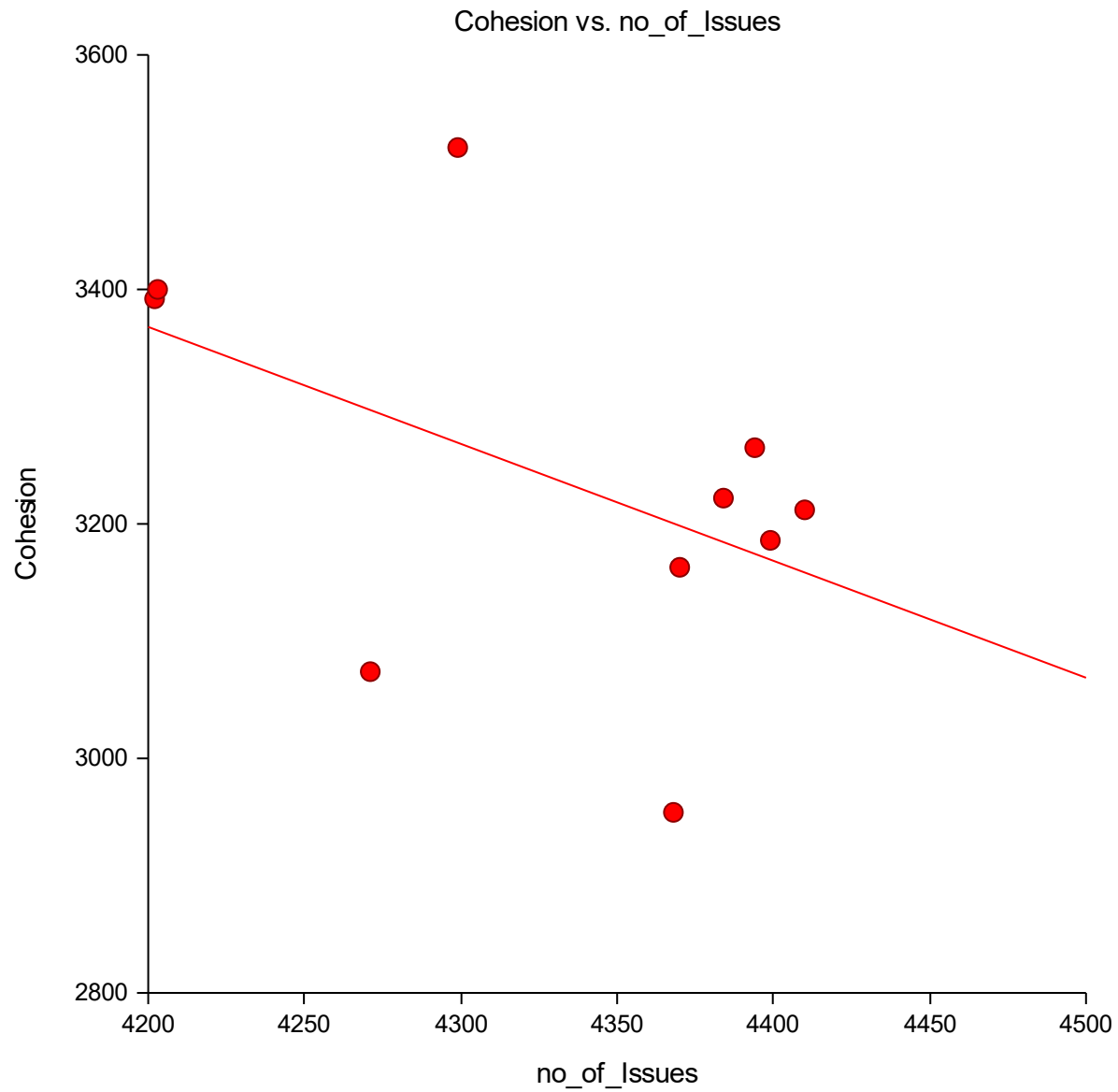
This report is for evaluation purposes only.  
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### Linear Regression Report

Dataset           Untitled  
Y = Cohesion   X = no\_of\_Issues

#### Linear Regression Plot Section

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### Linear Regression Report

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#### Run Summary Section

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Parameter	Value	Parameter	Value
Dependent Variable	Cohesion	Rows Processed	10
Independent Variable	no_of_Issues	Rows Used in Estimation	10
Frequency Variable	None	Rows with X Missing	0
Weight Variable	None	Rows with Freq Missing	0
Intercept	7554.5342	Rows Prediction Only	0
Slope	-0.9967	Sum of Frequencies	10
R-Squared	0.2334	Sum of Weights	10.0000
Correlation	-0.4831	Coefficient of Variation	0.0476
Mean Square Error	23724.53	Square Root of MSE	154.0277

#### Summary Statement

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The equation of the straight line relating Cohesion and no\_of\_Issues is estimated as: Cohesion = (7554.5342) + (-0.9967) no\_of\_Issues using the 10 observations in this dataset. The y-intercept, the estimated value of Cohesion when no\_of\_Issues is zero, is 7554.5342 with a standard error of 2765.6492. The slope, the estimated change in Cohesion per unit change in no\_of\_Issues, is -0.9967 with a standard error of 0.6386. The value of R-Squared, the proportion of the variation in Cohesion that can be accounted for by variation in no\_of\_Issues, is 0.2334. The correlation between Cohesion and no\_of\_Issues is -0.4831.

A significance test that the slope is zero resulted in a t-value of -1.5607. The significance level of this t-test is 0.1572. Since 0.1572 > 0.0500, the hypothesis that the slope is zero is not rejected.

The estimated slope is -0.9967. The lower limit of the 95% confidence interval for the slope is -2.4693 and the upper limit is 0.4760. The estimated intercept is 7554.5342. The lower limit of the 95% confidence interval for the intercept is 1176.9356 and the upper limit is 13932.1327.

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#### Regression Estimation Section

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Parameter	Intercept B(0)	Slope B(1)
Regression Coefficients	7554.5342	-0.9967
Lower 95% Confidence Limit	1176.9356	-2.4693
Upper 95% Confidence Limit	13932.1327	0.4760
Standard Error	2765.6492	0.6386
Standardized Coefficient	0.0000	-0.4831
T Value	2.7316	-1.5607
Prob Level (T Test)	0.0258	0.1572
Reject H0 (Alpha = 0.0500)	Yes	No
Power (Alpha = 0.0500)	0.6686	0.2803
Regression of Y on X	7554.5342	-0.9967
Inverse Regression from X on Y	21728.9388	-4.2702
Orthogonal Regression of Y and X	18604.6962	-3.5487

#### Notes:

The above report shows the least-squares estimates of the intercept and slope followed by the corresponding standard errors, confidence intervals, and hypothesis tests. Note that these results are based on several assumptions that should be validated before they are used.

#### Estimated Model

$(7554.534153888) + (-0.996682252630308) * (\text{no\_of\_Issues})$

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#### Correlation and R-Squared Section

Parameter	Pearson Correlation Coefficient	R-Squared	Spearman Rank Correlation Coefficient
Estimated Value	-0.4831	0.2334	-0.2848
Lower 95% Conf. Limit (r dist'n)	0.2010		
Upper 95% Conf. Limit (r dist'n)	-0.8328		
Lower 95% Conf. Limit (Fisher's z)	-0.8532		-0.7754
Upper 95% Conf. Limit (Fisher's z)	0.2106		0.4201
Adjusted (Rbar)		0.1376	
T-Value for H0: Rho = 0	1.5607	1.5607	0.8405
Prob Level for H0: Rho = 0	0.1572	0.1572	0.4250

#### Notes:

The confidence interval for the Pearson correlation assumes that X and Y follow the bivariate normal distribution. This is a different assumption from linear regression which assumes that X is fixed and Y is normally distributed.

Two confidence intervals are given. The first is based on the exact distribution of Pearson's correlation. The second is based on Fisher's z transformation which approximates the exact distribution using the normal distribution. Why are both provided? Because most books only mention Fisher's approximate method, it will often be needed to do homework. However, the exact methods should be used whenever possible.

The confidence limits can be used to test hypotheses about the correlation. To test the hypothesis that rho is a specific value, say  $r_0$ , check to see if  $r_0$  is between the confidence limits. If it is, the null hypothesis that  $\rho = r_0$  is not rejected. If  $r_0$  is outside the limits, the null hypothesis is rejected.

Spearman's Rank correlation is calculated by replacing the original data with their ranks. This correlation is used when some of the assumptions may be invalid.

#### Summary Matrices

Index	X'X 0	X'X 1	X'Y 2	X'X Inverse 0	X'X Inverse 1
0	10	43300	32389	322.4011	-0.07443444
1	43300	1.875472E+08	1.401864E+08	-0.07443444	1.71904E-05
2 (Y'Y)			1.051523E+08		
Determinant		581720			1.71904E-06

#### Variance - Covariance Matrix of Regression Coefficients

Index	VC(b) 0	VC(b) 1
0	7648816	-1765.922
1	-1765.922	0.4078342

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#### Tests of Assumptions Section

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Assumption/Test	Test Value	Prob Level	Is the Assumption Reasonable at the 0.2000 Level of Significance?
<b>Residuals follow Normal Distribution?</b>			
Shapiro Wilk	0.8900	0.169585	No
Anderson Darling	0.7031	0.066475	No
D'Agostino Skewness	-0.6456	0.518556	Yes
D'Agostino Kurtosis	0.7098	0.477813	Yes
D'Agostino Omnibus	0.9206	0.631089	Yes
<b>Constant Residual Variance?</b>			
Modified Levene Test	3.6852	0.091158	No
<b>Relationship is a Straight Line?</b>			
Lack of Linear Fit F(0, 0) Test	0.0000	0.000000	No

#### No Serial Correlation?

Evaluate the Serial-Correlation report and the Durbin-Watson test if you have equal-spaced, time series data.

#### Notes:

A 'Yes' means there is not enough evidence to make this assumption seem unreasonable. This lack of evidence may be because the sample size is too small, the assumptions of the test itself are not met, or the assumption is valid.

A 'No' means the that the assumption is not reasonable. However, since these tests are related to sample size, you should assess the role of sample size in the tests by also evaluating the appropriate plots and graphs. A large dataset (say  $N > 500$ ) will often fail at least one of the normality tests because it is hard to find a large dataset that is perfectly normal.

#### Normality and Constant Residual Variance:

Possible remedies for the failure of these assumptions include using a transformation of Y such as the log or square root, correcting data-recording errors found by looking into outliers, adding additional independent variables, using robust regression, or using bootstrap methods.

#### Straight-Line:

Possible remedies for the failure of this assumption include using nonlinear regression or polynomial regression.

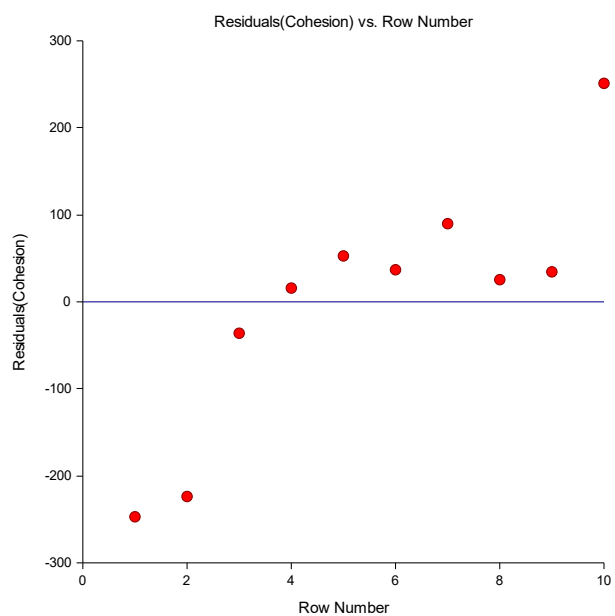
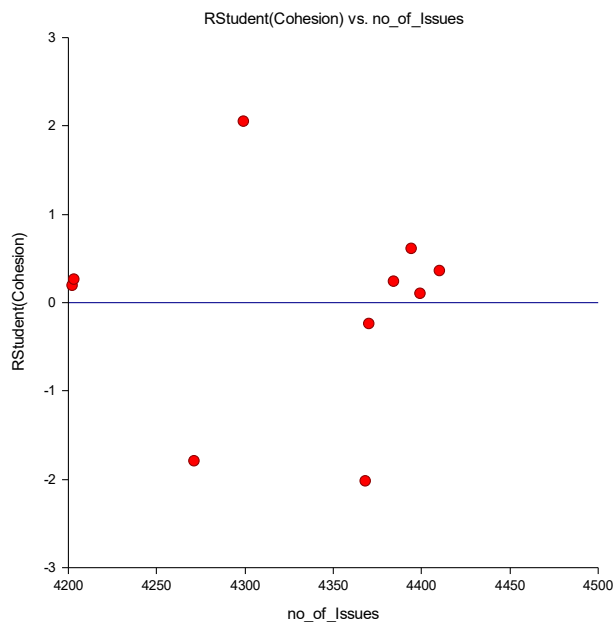
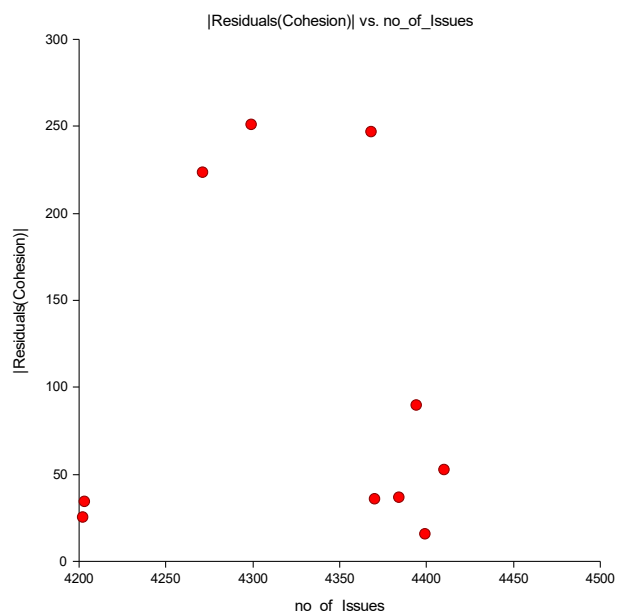
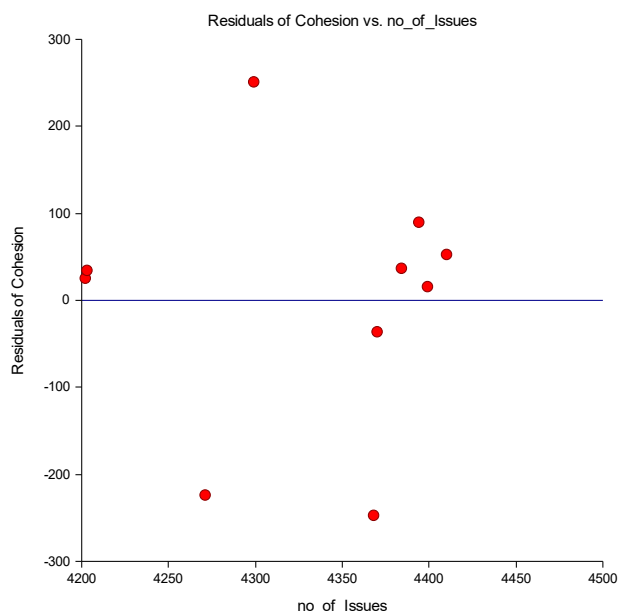
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### Residual Plots Section

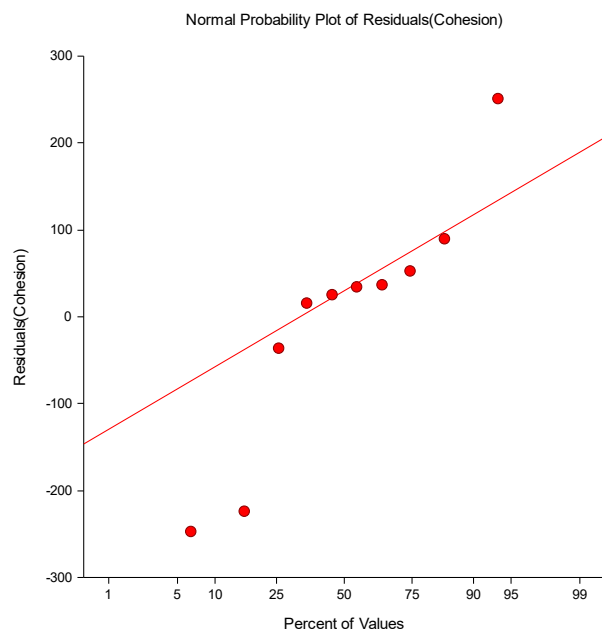
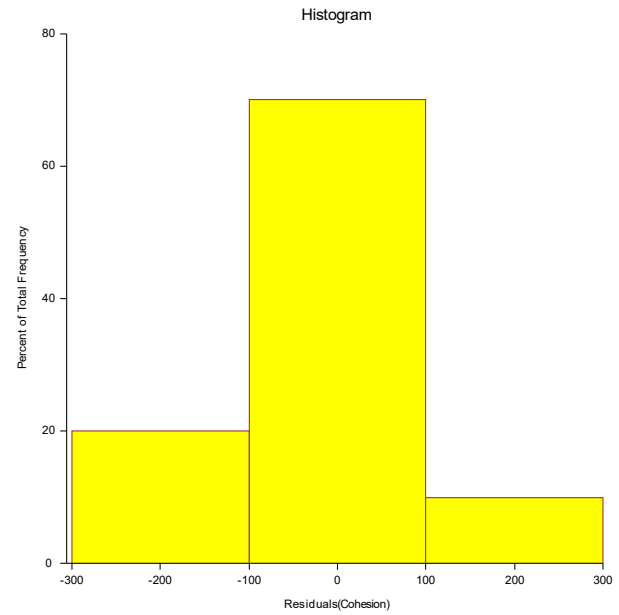
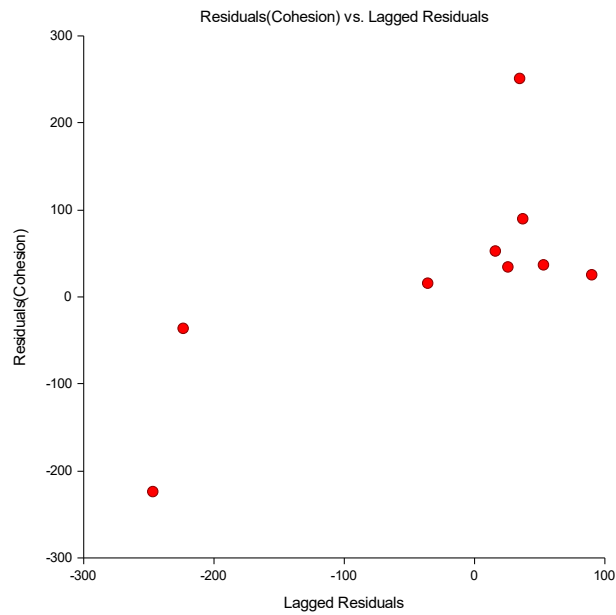
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## Linear Regression Report

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### Procedure Input Settings

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#### Autosaved Template File

C:\Users\KASATLA\Documents\NCSS 12\Procedure Templates\Autosave\Linear Regression and Correlation - Autosaved 2018\_3\_29-22\_42\_18.t153

#### Variables Tab

-- Variables -----  
 Y: Dependent Variable(s):                      Cohesion  
 X: Independent Variable:                      no\_of\_Issues  
 Frequency Variable:                      <Empty>  
 Weight Variable:                      <Empty>

-- Model Specification -----  
 Remove Intercept                      Unchecked

-- Resampling (Increases computation time) -----  
 Calculate Bootstrap C.I.'s                      Unchecked  
 Run Randomization Tests                      Unchecked

-- Alpha Levels -----  
 Alpha for C.I.'s and Tests:                      0.050  
 Alpha for Assumptions:                      0.20

#### Reports Tab

-- Select Report / Plot Group -----  
 Select a Group of Reports and Plots:                      Display only those items that are CHECKED BELOW  
 Show Notes                      Checked  
 Show All Rows                      Checked

-- Select Reports -----  
 .. Summaries .....  
 Run Summary                      Checked  
 Summary Statement                      Checked  
 Descriptive Statistics                      Unchecked  
 Correlation and R-Squared                      Checked  
 Summary Matrices                      Checked

.. Estimation .....  
 Regression Estimation                      Checked

.. ANOVA .....  
 ANOVA                      Unchecked

.. Assumptions .....  
 Assumptions                      Checked  
     Levene Groups:                      2  
 Durbin-Watson                      Unchecked  
 PRESS                      Unchecked



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### Procedure Input Settings (Continued)

#### Reports Tab (Continued)

.. Prediction .....	
Predict Y at these X values:	<Empty>
Predicted Y - C.L.	Unchecked
Predicted Y - P.L.	Unchecked
.. Row-by-Row Lists .....	
Original Data	Unchecked
Predicted Y Means	Unchecked
Predicted Y Individuals	Unchecked
Simultaneous Bands	Unchecked
Predicted X Means	Unchecked
Predicted X Individuals	Unchecked
.. Regression Diagnostics .....	
Residuals	Unchecked
Residual Diagnostics	Unchecked
Leave One Row Out	Unchecked
Outlier Detection Chart	Unchecked
Influence Detection Chart	Unchecked
Outlier-Influence Chart	Unchecked

#### Report Options Tab

-- Report Options -----	
Precision:	Single
Variable Names:	Names
.. Decimal Places .....	
Probability:	4
Beta (Coefficients):	4
SE:	4
T:	4
R2:	4
X:	4
Y:	4
Residuals:	4
Std Residuals:	4
Sum Squares:	All
Matrix:	All

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### Procedure Input Settings (Continued)

#### Plots Tab

-- Select Plots -----	
Y vs X	Checked
RStudent vs X	Checked
Histogram	Checked
Residuals vs X	Checked
Residuals vs Row	Checked
Probability Plot	Checked
Residuals  vs X	Checked
Serial Correlation	Checked
-- Plot Options -----	
Y vs X Plot Size:	Medium
All Other Plot Sizes:	Small

#### Resampling Tab

-- Bootstrap Calculation Options -----	
.. Sampling .....	
Samples (N):	3000
Sampling Method:	Observations
Retries:	50
.. Estimation .....	
Percentile Type:	Ave X(p[n+1])
C.I. Method:	Reflection
Bootstrap Confidence Coefficients:	0.90 0.95 0.99
-- Randomization Test Options -----	
Monte Carlo Samples:	1000

#### Storage Tab

-- Data Storage Options -----	
Storage Option:	Do not store data