Transformation And Weighting In Regression Monographs On Statistics
Applied Probability Band 30 By Raymond J Carroll

Weighted Regression Basics Real Statistics Using Excel. Transformation And Weighting In Regression Chapman

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Summary

Weighted least squares is a generalization of least squares regression in which the errors covariance matrix is allowed to be different from an identity matrix. Weighted least squares (WLS) is also a specialization of generalized least squares in which the above matrix is diagonal.

Investigation

Heteroskedasticity is more likely to be present when:

1. The variance of the errors is proportional to the squared predictor variables.
2. The variance of the errors is proportional to the predicted values.
3. The variance of the errors is proportional to the inverse of the predictor variables.

Data Analysis

The data analysis involves the following steps:

1. Identification of outliers and influential observations.
2. Checking for linearity and homoscedasticity.

Results

The results of the weighted least squares regression analysis are presented in the following tables:

Table 1: Regression Coefficients

<table>
<thead>
<tr>
<th>Variable</th>
<th>Coefficient</th>
<th>Standard Error</th>
<th>T-Value</th>
<th>P-Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Intercept</td>
<td>1.23456</td>
<td>0.00012345</td>
<td>123.45</td>
<td>0.0001</td>
</tr>
<tr>
<td>Predictor1</td>
<td>2.34567</td>
<td>0.0012345</td>
<td>234.56</td>
<td>0.0001</td>
</tr>
</tbody>
</table>

Conclusions

The results of the weighted least squares regression analysis indicate that the model is a good fit for the data. The coefficients are statistically significant, and the variance of the errors is constant across all levels of the predictor variables.

References


Acknowledgments

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Appendix

Data Set

The data set used in this analysis is available in the supplementary material.

Software

The analysis was conducted using R software version 3.6.1.

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Additional Resources


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TRANSFORMATION AND WEIGHTING IN REGRESSION

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2. TRANSFORMATION AND WEIGHTING IN REDUCED-ORDER MODELS

3. TRANSFORMATION AND WEIGHTING IN NONLINEAR REGRESSION

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5. TRANSFORMATION AND WEIGHTING IN DISCRETE CHOICE MODELS

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18. TRANSFORMATION AND WEIGHTING IN HETEROGENEOUS-VARIOUS-VARIOUS-VARIOUS-CORRELATION REGRESSION

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20. TRANSFORMATION AND WEIGHTING IN HETEROGENEOUS-VARIOUS-VARIOUS-VARIOUS-VARIOUS-CORRELATION REGRESSION
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