

**Nonlinear Regression - y1**

Dependent variable: y1

Independent variables:

 ln05

Function to be estimated: B0-((1-2,71828^(-B1\*5))/5)\*ln05

Initial parameter estimates:

 B0 = 0,3

 B1 = 0,1

Estimation method: Marquardt

Estimation stopped due to convergence of parameter estimates.

Number of iterations: 5

Number of function calls: 16

**Estimation Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | *Asymptotic* | *95,0%* |
|  |  | *Asymptotic* | *Confidence* | *Interval* |
| *Parameter* | *Estimate* | *Standard Error* | *Lower* | *Upper* |
| B0 | 0,151297 | 0,0862657 | -0,0242127 | 0,326806 |
| B1 | 0,0119758 | 0,00970201 | -0,00776309 | 0,0317148 |

**Analysis of Variance**

|  |  |  |  |
| --- | --- | --- | --- |
| *Source* | *Sum of Squares* | *Df* | *Mean Square* |
| Model | 0,0605024 | 2 | 0,0302512 |
| Residual | 0,0123919 | 33 | 0,000375511 |
| Total | 0,0728942 | 35 |  |
| Total (Corr.) | 0,0130025 | 34 |  |

R-Squared = 4,69626 percent

R-Squared (adjusted for d.f.) = 1,80827 percent

Standard Error of Est. = 0,0193781

Mean absolute error = 0,0162155

Durbin-Watson statistic = 0,620367

Lag 1 residual autocorrelation = 0,688843

**Residual Analysis**

|  |  |  |
| --- | --- | --- |
|  | *Estimation* | *Validation* |
| n | 35 |  |
| MSE | 0,000375511 |  |
| MAE | 0,0162155 |  |
| MAPE | 72,3075 |  |
| ME | 0,00000138388 |  |
| MPE | -45,2722 |  |

**The StatAdvisor**

The output shows the results of fitting a nonlinear regression model to describe the relationship between y1 and 1 independent variables. The equation of the fitted model is

y1 = 0,151297-((1-2,71828^(-0,0119758\*5))/5)\*ln05

In performing the fit, the estimation process terminated successully after 5 iterations, at which point the residual sum of squares appeared to approach a minimum.

The R-Squared statistic indicates that the model as fitted explains 4,69626% of the variability in y1. The adjusted R-Squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 1,80827%. The standard error of the estimate shows the standard deviation of the residuals to be 0,0193781. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu. The mean absolute error (MAE) of 0,0162155 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file.

The output also shows aymptotic 95,0% confidence intervals for each of the unknown parameters. These intervals are approximate and most accurate for large sample sizes. You can determine whether or not an estimate is statistically significant by examining each interval to see whether it contains the value 0. Intervals covering 0 correspond to coefficients which may well be removed form the model without hurting the fit substantially.



**Nonlinear Regression - y2**

Dependent variable: y2

Independent variables:

 ln11\_1

Function to be estimated: B0-((1-2,71828^(-B1\*5))/5)\*ln11\_1

Initial parameter estimates:

 B0 = 0,3

 B1 = 0,1

Estimation method: Marquardt

Estimation stopped due to convergence of parameter estimates.

Number of iterations: 5

Number of function calls: 16

**Estimation Results**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  |  | *Asymptotic* | *95,0%* |
|  |  | *Asymptotic* | *Confidence* | *Interval* |
| *Parameter* | *Estimate* | *Standard Error* | *Lower* | *Upper* |
| B0 | 0,151297 | 0,0862657 | -0,0242127 | 0,326806 |
| B1 | 0,0119758 | 0,00970201 | -0,00776309 | 0,0317148 |

**Analysis of Variance**

|  |  |  |  |
| --- | --- | --- | --- |
| *Source* | *Sum of Squares* | *Df* | *Mean Square* |
| Model | 0,0605024 | 2 | 0,0302512 |
| Residual | 0,0123919 | 33 | 0,000375511 |
| Total | 0,0728942 | 35 |  |
| Total (Corr.) | 0,0130025 | 34 |  |

R-Squared = 4,69626 percent

R-Squared (adjusted for d.f.) = 1,80827 percent

Standard Error of Est. = 0,0193781

Mean absolute error = 0,0162155

Durbin-Watson statistic = 0,620367

Lag 1 residual autocorrelation = 0,688843

**Residual Analysis**

|  |  |  |
| --- | --- | --- |
|  | *Estimation* | *Validation* |
| n | 35 |  |
| MSE | 0,000375511 |  |
| MAE | 0,0162155 |  |
| MAPE | 72,3075 |  |
| ME | 0,00000138388 |  |
| MPE | -45,2722 |  |

**The StatAdvisor**

The output shows the results of fitting a nonlinear regression model to describe the relationship between y2 and 1 independent variables. The equation of the fitted model is

y2 = 0,151297-((1-2,71828^(-0,0119758\*5))/5)\*ln11\_1

In performing the fit, the estimation process terminated successully after 5 iterations, at which point the residual sum of squares appeared to approach a minimum.

The R-Squared statistic indicates that the model as fitted explains 4,69626% of the variability in y2. The adjusted R-Squared statistic, which is more suitable for comparing models with different numbers of independent variables, is 1,80827%. The standard error of the estimate shows the standard deviation of the residuals to be 0,0193781. This value can be used to construct prediction limits for new observations by selecting the Forecasts option from the text menu. The mean absolute error (MAE) of 0,0162155 is the average value of the residuals. The Durbin-Watson (DW) statistic tests the residuals to determine if there is any significant correlation based on the order in which they occur in your data file.

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