

# **The Marginal and Joint Influence in Nonlinear Regression**

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It is well understood that, in regression analysis, some observations have a greater impact on the estimated model than others. Observations that have a substantial effect on the obtained results are influential observations. Detection of these observations is an important step in the analysis. In this article explicit expressions for a marginal and a joint influence measure are derived for the parameter estimates in a nonlinear regression model with an additive error term. Moreover, an explicit expression for an influence measure of the observations on the score test statistic is also derived. These measures can be used to identify influential observations and aid in the model selection process. A numerical example illustrates how substantially influential observations affects the score test statistic and the parameter estimates. The numerical example also illustrates how these measures can be used together to gain more information from the influence analysis.

**Keywords:** Empirical influence curve, influential observations, nonlinear regression, Score test.