**Stats Models**

“ statsmodels ” is a Python package that provides a complement to SciPy for statistical computations including descriptive statistics and estimation and inference for statistical models.

**Key Features with Focus on p-values and VIF**

1. Linear Models:

* Ordinary Least Squares (OLS)
* Generalized Least Squares (GLS)
* Weighted Least Squares (WLS)
* Quantile Regression
* Generalized Linear Models (GLM):

1. Logistic Regression

* Poisson Regression
* Other models using different link functions and distributions

1. Time Series Analysis:

* AR, MA, ARMA, ARIMA, and SARIMAX models
* State space models
* VAR (Vector Autoregression)
* Structural Time Series models

Key Statistical Values

1. P-values:

P-values are used to determine the significance of individual predictors in your model. In statsmodels, p-values are provided in the model summary, indicating whether to reject the null hypothesis that a coefficient is equal to zero.

1. Variance Inflation Factor (VIF):

VIF measures the multicollinearity among the predictors. High VIF values indicate high multicollinearity, which can inflate the standard errors and make it difficult to assess the effect of individual predictors.

Interpretation

1. P-values:

Check the p-values in the model summary. Predictors with p-values below the significance threshold (e.g., 0.05) are considered statistically significant.

1. VIF:

Assess the VIF values. Predictors with VIF > 10 may need to be investigated for multicollinearity issues. You might consider removing or combining these predictors to improve model performance.

Conclusion

The statsmodels library is a powerful tool for statistical analysis, providing detailed summaries that include p-values for significance testing and VIF values for diagnosing multicollinearity. These metrics help ensure the robustness and reliability of your statistical models.