**Moore-Penrose Pseudoinverse**

**Abstract**

This Package provides a graphical user interface (GUI) for generating random linear data, fitting a linear regression model, and visualizing the results. Built using Tkinter and Matplotlib libraries, the package allows users to generate datasets of varying sizes, fit a linear regression model using the Moore-Penrose pseudoinverse, and assess model performance through metrics such as mean squared error and R-squared. The fitted model can be visualized and saved or loaded from a file for future use. Additional features include a results display, model statistics, and options to reset data and visualizations. This package simplifies data analysis workflows by integrating model fitting, visualization, and evaluation into an interactive and user-friendly interface.

The interface includes dynamic visualization capabilities, where users can plot both the raw data and the fitted regression line in real-time. Furthermore, the package allows for model persistence, enabling users to save the fitted model as a JSON file and reload it later for further analysis. Additional features include the ability to reset data, clear plots, and view detailed statistical summaries of the model fit, making it a comprehensive tool for regression analysis and educational purposes. The integration of Tkinter and Matplotlib helps in combining data generation, modelling, evaluation, and visualization in a single, easy-to-use environment.

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