

Simple Linear Regression Analysis

This project focuses on performing and understanding Simple Linear Regression using both **Statsmodels** and **Scikit-Learn**. The **Advertising Dataset** is utilized for the analysis, particularly exploring the relationship between **TV Advertising Spend** and **Sales**.

Objective

The primary goal is to:

1. Understand the implementation of Simple Linear Regression.
2. Compare the results and interpretability of models built using Statsmodels and Scikit-Learn.
3. Analyze the relationship between TV advertising spend and Sales.

Steps Followed

1. **Data Loading and Exploration:**
 - Loaded the advertising dataset.
 - Visualized the relationship between TV spend and Sales using scatter plots.
 - Checked correlation between variables.
2. **Model Building:**
 - **Statsmodels:**
 - Built a regression model to gain detailed insights into coefficients and p-values.
 - **Scikit-Learn:**
 - Split the data into training and testing sets.
 - Fit a regression model to predict sales based on TV spend.
 - Evaluated model performance using R^2 score and residual plots.
3. **Model Comparison:**
 - Compared the interpretability and results from Statsmodels and Scikit-Learn.
 - Assessed model accuracy on training and testing data.