**Introduction**

This analysis explores a simple linear regression model constructed using a dataset from the YBI Foundation GitHub repository titled "Salary Data". The dataset contains two primary variables: **"Experience Years"** (independent variable, denoted as XX) and **"Salary"** (dependent variable, denoted as YY). The primary objective is to understand the linear relationship between years of experience and corresponding salary levels. The data is split into training and testing subsets using a 70-30 ratio, and the regression model is fitted on the training data. This model is aimed at predicting the salary based on the number of years of experience, assuming a linear relationship between these variables.

**Findings and Interpretation**

The regression model follows the general form of a linear equation:

Y^=β0+β1X

Where:

* Y^ is the predicted salary,
* β0(intercept) ≈ 26357.95,
* β1(coefficient) ≈ 9443.56.

This implies that for every additional year of experience, the expected increase in salary is approximately 9443.56 units. The intercept indicates the estimated base salary when experience is zero.

**Model Performance Metrics:**

* **Mean Absolute Error (MAE):** ≈ 2877.53
* **Mean Absolute Percentage Error (MAPE):** ≈ 0.0592 (5.92%)
* **Mean Squared Error (MSE):** ≈ 12348024.44

These metrics indicate a reasonably good fit, as the error percentages are low, and the model shows consistent predictive accuracy. The small MAE and MAPE values suggest that the predictions are closely aligned with actual values.

If a graph were plotted (typically a scatter plot with a regression line), it would display data points of actual salary values against years of experience, with the regression line illustrating the best-fit linear trend. Mathematically, such a graph would show a strong positive linear correlation between the two variables. The slope of the regression line (β1) being significantly positive supports this upward trend.

**Conclusion**

In conclusion, the analysis successfully establishes a statistically significant linear relationship between years of experience and salary. The model reveals that salary tends to increase by approximately 9444 units for each additional year of experience, which aligns with real-world expectations. The evaluation metrics demonstrate the model's reliability in making predictions with minimal error. This simple linear regression can be a useful tool for preliminary salary forecasting based on experience, especially in HR analytics or career planning domains. Further improvements could include adding more predictor variables or testing for non-linear patterns to enhance model robustness.