Report

Dataset 1:

It will be a Straight line

Observations and Analysis:

- All three methods yield very similar evaluation metrics, with negligible differences in the MSE, MAE, R-squared, and RMSE values.

- The R-squared values are close to 1, indicating that the models explain a high percentage of the variance in the target variable.

- The RMSE values are also comparable, suggesting that the models have similar predictive accuracy in terms of the root mean squared error.

- The performance of the models is consistent across the different methods, indicating the reliability of the implemented linear regression models.

Dataset 2:

It will be exponential.

- Both the Direct Calculation Method and Scikit-learn Method yielded similar results for the given datasets.

- The error metrics (MSE, MAE, R-squared, and RMSE) obtained from both methods were almost identical, indicating that both approaches effectively modeled the relationships between the input features and target variable.

Dataset 3:

There will be no hyperplane.

- We utilized the LinearRegression class from the scikit-learn library to train a linear regression model.

- The model was trained on the input features and the target variable.

- Predictions were made using the trained model, and error metrics were computed.

Dataset 4:

It will be 2-d plane.

- Based on the available results, both the Direct Calculation Method and the Scikit-learn Method exhibit similar performance for the given dataset.
- The Gradient Descent Method also provides comparable results; however, further analysis and error calculation are required to make a definitive comparison

So, overall on dataset1 and 4 we can directly apply the linear regression model. On dataset 2, we are applying after transforming it. And dataset 3 is not applicable for linear regression.