Project Report

Project Title: Linear Regression Model

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1. Introduction

This project demonstrates the implementation of a Linear Regression model. Linear Regression is a supervised machine learning algorithm used to model the relationship between a dependent variable (target) and one or more independent variables (features). The main objective of this project is to build a regression model, train it on a dataset, and evaluate its performance using statistical metrics.

2. Dataset Description

The dataset used in this project contains input features and a target variable suitable for regression analysis. The features represent the independent variables, while the target represents the dependent variable we aim to predict. The dataset was preprocessed to handle missing values, normalize data, and split into training and testing sets.

3. Methodology

The following steps were performed in this project:

1. Data Preprocessing – Cleaning the dataset, handling missing values, and preparing features.
2. Splitting Data – Dividing the dataset into training and testing sets.
3. Model Training – Applying Linear Regression to the training data.
4. Model Evaluation – Using metrics such as R^2 score and Mean Squared Error (MSE) to measure performance.

4. Results & Discussion

The Linear Regression model was successfully trained and tested on the dataset. The performance metrics such as R^2 score and Mean Squared Error (MSE) show how well the model fits the data and predicts unseen values. From the analysis, the model achieved satisfactory accuracy, demonstrating the ability of Linear Regression to capture relationships between input features and the target variable.

5. Conclusion

This project provided hands-on experience in applying Linear Regression for predictive analysis. The results show that the model is effective in handling regression tasks. In future work, improvements can be made by trying other regression models such as Ridge Regression, Lasso Regression, or more complex algorithms to enhance prediction accuracy.

6. References

1. Scikit-learn Documentation: https://scikit-learn.org/
2. Python Official Documentation: https://docs.python.org/
3. Machine Learning Tutorials and Resources