



## **Report on:**

### **Regression Task**

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## **1. Abstract**

In this report, a regression assignment aims at forecasting the adjusted closing price based on historical financial data. The research is aligned to the Sustainable Development Goal 8 (Decent Work and Economic Growth), because of identifying the importance of data-based models in economic research.

## **2. Introduction**

Regression equations find extensive applications in the financial and economic sides to estimate the continuous sum outcomes. Predicting the prices accurately may help in better decision-making and planning of the economy.

## **3. Dataset Description**

The necessary data to satisfy the research question is in the FINAL\_USO.csv data set, which included the price information of commodities such as open, high, low, and close price and the trading volume adjusted close price. Adjusted closing price was the target variable that was going to be predicted.

## **4. Methodology**

Data went through the cleaning process by excluding non-numeric columns and treating missing values. Linear Regression, Ridge Regression and MLP Regressor models were then trained in feature scaling mode. The neural network hyperparameters were also optimized so as to enhance the performance.

## **5. Results and Discussion**

The assessment of model performance was done through Mean Squared Error (MSE) and coefficient of determination ( $R^2$ ) assessment. The MLP regressor recorded the largest  $R^2$  value and this is its capacity to make complex non-linear financial predictions.

## **6. Ethical, Social and Sustainability Impact**

There is potential to have sustainable economic growth through financial prediction models as long as these are used in a responsible manner. The predictions should be used carefully and the limitations of the models open.

## **7. Conclusion**

The regression problem is a validation that neuro network-based models are more effective in solving complex financial prediction tasks as compared to the traditional linear models.

## **8. References**

Pedregosa, F. et al. (2011). Scikit-learn: Machine Learning in Python. *Journal of Machine Learning Research*.

Google Colab Documentation.