**Future Sales Prediction**

**5.1 Short Explanation (Future Sales Prediction)**

* In this project, we aim to predict future sales based on historical data of advertising spending. The goal is to build a model that can provide accurate sales predictions by analyzing the relationships between advertising expenditures and total sales.

**5.2 Algorithm**

* The algorithm used in this project involves two main steps: data preprocessing and model building. We utilize Linear Regression and Decision Tree Regressor models to create predictive models for sales.
* Step 1: Import Necessary Libraries
* Step 2: Load the Dataset
* Step 3: Data Preprocessing
* Step 4: Model Selection and Training
* Step 5: Make Prediction on the Test Set For Both Models
* Step 6: Evaluation
* Step 7: Print Linear Regression Metrices
* Step 8: Print Decision Tree Regression Metrices
* Step 9: Visualization

**5.3 Data Set Details**

* Dataset: 'Sales.csv'
* Dataset Source: [Kaggle - Future Sales Prediction](https://www.kaggle.com/datasets/chakradharmattapalli/future-sales-prediction)
* Dataset Link: [**https://www.kaggle.com/datasets/chakradharmattapalli/future-sales-prediction**](https://www.kaggle.com/datasets/chakradharmattapalli/future-sales-prediction)

**5.4 Details about Columns**

* TV: Advertising spending on TV.
* Radio: Advertising spending on the radio.
* Newspaper: Advertising spending on newspapers.
* Sales: Total sales.

**5.5 Libraries and Tools**

* Pandas: Data manipulation and analysis.
* NumPy: Numerical operations.
* Scikit-learn: Machine learning models and evaluation metrics.
* Matplotlib: Data visualization.

**5.6 Data Preprocessing, Training, and Testing**

* Loading the historical sales dataset.
* Selecting the relevant features (TV, Radio, Newspaper) and the target variable (Sales).
* Splitting the data into a training set (80%) and a testing set (20%) for model evaluation.

**5.7 Metrics for Accuracy Check**

* Mean Squared Error (MSE) and Root Mean Squared Error (RMSE).
* Mean Absolute Error (MAE).
* R-squared (R2) to measure the goodness of fit.

**5.8 Conclusion**

* This project provides a foundational model for predicting future sales based on advertising spending. Further analysis, feature engineering, and model refinement are recommended for enhancing the accuracy of the predictions.

**5.9 Program Link**

GitHub Link : <https://github.com/ShariqueShaqub/ADS_Phase1.git>