TASK 5: SALES PREDICTION USING ADVERTISING DATA

Documentation& Report

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1. Introduction

Sales prediction plays an important role in business decision-making.
In this task, a machine learning model is developed to predict product sales based on advertising expenditure across different media platforms.

The model helps understand how advertising on TV, Radio, and Newspaper affects overall sales.

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2. Objective

The main objectives of Task 5 are:

- To analyze the relationship between advertising budgets and sales
- To build a machine learning regression model
- To predict sales for new advertising data
- To visualize model performance

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3. Tools and Technologies Used

- **Programming Language:** Python
- **Platform:** Jupyter Notebook
- **Libraries Used:**
    - Pandas
    - NumPy
    - Matplotlib
    - Scikit-learn

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4. Dataset Description

The dataset contains advertising expenditure data with the following attributes:

- **TV:** Advertising budget spent on TV

- **Radio:** Advertising budget spent on Radio
- **Newspaper:** Advertising budget spent on Newspaper
- **Sales:** Total sales generated

This dataset is used to train a regression model to predict sales.

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5. Methodology

The steps followed in this task are:

1. Importing necessary Python libraries
2. Loading the advertising dataset
3. Separating independent variables (TV, Radio, Newspaper) and dependent variable (Sales)
4. Splitting the dataset into training and testing sets
5. Training the model using Multiple Linear Regression
6. Evaluating the model using visual representation
7. Predicting sales for new input values

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6. Algorithm Used

Multiple Linear Regression

Multiple Linear Regression is used to model the relationship between multiple independent variables and a dependent variable.
It predicts sales based on advertising expenditures.

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7. Model Evaluation

- A scatter plot of **Actual Sales vs Predicted Sales** is generated
- The plot shows a strong positive correlation
- This indicates that the model performs well and predictions are close to actual values

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8. Prediction Result

New advertising data used for prediction:

- **TV:** 150
- **Radio:** 25
- **Newspaper:** 20

Predicted Sales Output:

Predicted Sales ≈ 14.47

This result indicates the expected sales value for the given advertising investment.

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9. Conclusion

The sales prediction model successfully predicts sales based on advertising expenditure.
Multiple Linear Regression proved effective for this dataset and produced accurate results.

This task enhanced understanding of regression models, data handling, and prediction techniques in machine learning.
