

# **Project Title: Predicting Sales Using TV Advertising Budget**

## **Objective:**

To build a simple linear regression model that predicts product sales based solely on the TV advertising budget. This project aims to uncover the strength of the relationship between marketing investment in television and its impact on sales figures.

## **Dataset Used:**

Name: Advertising Budget and Sales.csv

Records: 200 entries

Features:

- TV Ad Budget (\$)
- Radio Ad Budget (\$)
- Newspaper Ad Budget (\$)
- Sales (\$) [Target variable]

For this project, only the TV Ad Budget (\$) column was used as the independent variable to keep the model simple and focused.

## **Project Description:**

This project performs a supervised regression task to predict the numeric value of sales. It begins with data loading and inspection, followed by focusing on the relationship between TV ad budget and sales. The data is split into training and testing sets to ensure unbiased model evaluation.

Using linear regression, we model how sales vary in response to changes in TV advertising budget. The model is then evaluated based on standard performance metrics such as R<sup>2</sup> score and Mean Squared Error (MSE), helping to understand how well the model fits the data.

## **Model Used:**

Linear Regression (from the Scikit-learn library)

A statistical method used to model the relationship between a dependent variable and one

independent variable by fitting a straight line.

### **Process Followed:**

1. Data Understanding - Overview and exploration of the dataset
2. Feature Selection - Choosing only the TV Ad Budget (\$) as the input
3. Data Splitting - Train-test split (80%-20%)
4. Model Training - Fitting a simple linear regression model
5. Prediction - Using the model to predict sales on test data
6. Evaluation - Using metrics like R2 and MSE
7. Visualization - Plotting the regression line against actual data

### **Conclusion:**

The model showed a strong positive linear relationship between TV ad budget and sales, indicating that increasing investment in television advertising is likely to increase sales. This supports data-driven decision-making in marketing budget allocation.