

HW 2 _ Linear Model

1. Which advertising channel has the least impact on sales volume? Provide evidence from your analysis and explain your reasoning.

The output of `lr.coef_` is [3.68334078 2.90625242 0.14194772]. These are the coefficients for TV, radio and newspaper respectively. So, it is clear that the coefficient of 'newspaper' is smaller than that of 'TV' and 'radio'. After scaling, for a linear increase in advertising budget, investing in newspaper advertising gives a much smaller increase in sales compared to investing the same amount in TV or radio advertising.

2. If we increase the amount spent on TV advertising by one dollar, while keeping the amounts spent on radio and newspaper advertising constant, what will be the expected change in sales volume? Support your answer with your findings and explain your reasoning clearly.

The output of `lr.coef_` is [3.68334078 2.90625242 0.14194772]. Increasing the amount spent on TV advertising by one dollar will increase sales volume by approximately **3.68 units**, while keeping the amounts spent on radio and newspaper advertising constant. Again, we got R^2 scores (0.91 for training and 0.86 for testing), which means the relationship between TV advertising and sales is strong and reliable and the prediction is also accurate.