**Question:** Can you comment on the model performance? How well does this multiple linear regression model work in terms of helping with sales forecasting?

**Feedback:**

There are multiple angles to take to evaluate model performance. For example, in in terms of the accuracy and goodness of fit of the regression:

If you recall your knowledge from previous courses, the R2 value and Standard Error can answer this question. More specifically:

\* The R2 value of 0.53 indicates that 53 percent of the variation in y is explained by our regression model.

\* The Standard Error of 58.43 indicates that according to standard normal distribution, approximately 68 percent of the predictions for y m are accurate within one standard error (58.43) and 95 percent of your predictions for Y made from Equation 2 are accurate within two standard errors (116.86).

**Question**: After knowing the basic concepts, now do you think neural networks will be able to outperform or will underperform multiple linear model in forecasting? Why do you think so?

**Feedback:**

Neural network might outperform multiple linear model in forecasting mainly because it has a much more relaxed assumption on the functional forms of model variables. Therefore, neural network could potentially find the best (combination of) form of relationships between variables of interest.

**Question**: Model results seem to inform us that neural networks works better in terms of forecasting accuracy. Can you think of why do people still prefer multiple linear regression sometimes? (Hint: Compare and contrast what the two methods can and cannot provide)

**Feedback**:

A significant disadvantage of machine learning algorithms like neural networks is that the process mechanism is still a “black box”—we are not able to figure out the exact relationship between model variables (price and advertising in our case) and outcome. However, if we use regression methods like multiple linear regression, we will clearly know from model output that, for example, a unit decrease in price will lead to around 17 units of increase in sales. Hence, regression models are more useful when the focus of the analyst/firm is about diagnosing and strategically improve current practice or about allocating limited budget onto different activities. In contrast, neural networks and other algorithms are more useful when the objective of modelling is about prediction accuracy.