Testing a Marketing Mix Model

So far in this module, we have developed two models, one with main effects and one that includes an interaction term. To assess the predictive ability of the models, we will use them to predict sales on the dataset that was not used to calibrate the model. For convenience, let's rename the worksheets that have the regression results to "Main Effect Results" and "Interaction Results" respectively.

- In cell J1 of the "MM data-forecast" sheet, type in the label "Main Effect Prediction". In cell K1, type in "Interaction Prediction". In these two columns we will use the regression equations to calculate the expected sales based on the marketing activity.
- In cell J2, enter the regression equation corresponding to the main effects model. Referencing the cells containing the regression results, this will be:

='Main Effect Results'!$M$17+('Main Effect Results'!$M$18*'MM data-forecast'!B2)+('Main Effect Results'!$M$19*'MM data-forecast'!C2)+('Main Effect Results'!$M$20*'MM data-forecast'!D2)

- In cell K2, enter the regression equation corresponding to the model that includes the interaction effects. To construct the interaction effect in the prediction equation, we will multiply the feature and display values together. Referencing the cells containing the regression results, this will be:

='Interaction Results'!$M$17+('Interaction Results'!$M$18*'MM data-forecast'!B2)+('Interaction Results'!$M$19*'MM data-forecast'!C2)+('Interaction Results'!$M$20*'MM data-forecast'!D2)+('Interaction Results'!$M$21*'MM data-forecast'!C2*'MM data-forecast'!D2)

- Copy the formulas in cells J2 and K2 down the worksheet

To evaluate the accuracy of the predictions, we will examine the mean absolute error (MAE) resulting from each model.

- In L2, calculate the absolute value of the difference between the observed sales (A2) and the predicted sales from the main effects model (J2) using the formula =abs(A2-L2)
- Perform a similar calculation in cell M2 for the model with the interaction effect using the formula =abs(A2-M2)
- Copy the formulas in L2 and M2 down their respective columns
- To compare the performance of the models, calculate the average of the absolute errors across the observations using the formulas =average(L2:L438) and =average(M2:M438). The model with the smaller mean absolute error provides a better predictive fit.