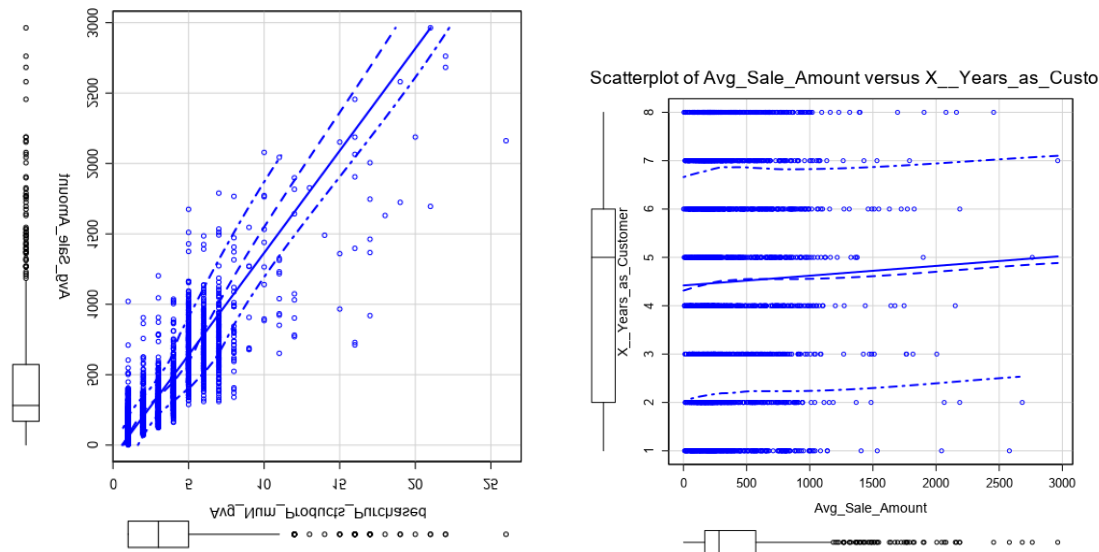


1. How and why did you select the predictor variables in your model? You must explain how your continuous predictor variables you've chosen have a linear relationship with the target variable. Please refer back to the "Multiple Linear Regression with Excel" lesson to help you explore your data and use scatterplots to search for linear relationships. You must include scatterplots in your answer.

A linear regression study is performed on all variables against Average Sale Amount. Scatterplots of Average Number of Product and Customer Year versus Average Sale Amount are also plotted to study the linearity.



2. Explain why you believe your linear model is a good model. You must justify your reasoning using the statistical results that your regression model created. For each variable you selected, please justify how each variable is a good fit for your model by using the p-values and R-squared values that your model produced.

R square and adjusted R square regression function is used to determine the strength of the linear regression model. Result shows that R squared value of 0.8371 and adjusted R-squared value of 0.8368 which is a high and good value for regression analysis.

3. What is the best linear regression equation based on the available data? Each coefficient should have no more than 2 digits after the decimal (ex: 1.28)

$$\text{Avg_Sale_Amount} = 313.76 - 149.11 \times (\text{If Type: Loyalty Club Only}) + 282.62 \times (\text{If Type: Loyalty Club and Credit Card}) - 245.48 \times (\text{If Type: Store Mailing List}) + 0 \times (\text{If Type: Credit Card Only}) + 67.02 \times (\text{Avg_Num_Products_Purchased})$$

Coefficients:

	Estimate	Std. Error	t value	Pr(> t)
(Intercept)	313.76	11.861	26.454	< 2.2e-16 ***
Customer_SegmentLoyalty Club Only	-149.11	8.969	-16.625	< 2.2e-16 ***
Customer_SegmentLoyalty Club and Credit Card	282.62	11.910	23.729	< 2.2e-16 ***
Customer_SegmentStore Mailing List	-245.48	9.762	-25.146	< 2.2e-16 ***
Avg_Num_Products_Purchased	67.02	1.514	44.255	< 2.2e-16 ***
X_Years_as_Customer	-2.34	1.223	-1.914	0.0558 .

Step 3: Presentation/Visualization

Use your model results to provide a recommendation. (500 word limit)

At the minimum, answer these questions:

1. What is your recommendation? Should the company send the catalog to these 250 customers?

The company should send the catalog to these 250 new customers. They are good profit for the company.

2. How did you come up with your recommendation? (Please explain your process so reviewers can give you feedback on your process)

Using linear regression model, the expected revenue from each customer is determined by multiplying expected sale amount with Score_Yes value. With a gross margin of 50%, 50% is deducted from the sum of expected revenue before the cost of catalog (\$6.50) is subtracted to obtain net profit.

3. What is the expected profit from the new catalog (assuming the catalog is sent to these 250 customers)?

$$= (70321.46 \times 0.5) - (6.50 \times 250) \\ = 33535.73$$