Project 1: Predicting Catalog Demand

Complete each section. When you are ready, save your file as a PDF document and submit it here: <https://classroom.udacity.com/nanodegrees/nd008/parts/c0b53068-1239-4f01-82bf-24886872f48e/project>

## Step 1: Business and Data Understanding

*Provide an explanation of the key decisions that need to be made. (500 word limit)*

### Key Decisions:

*Answer these questions*

1. What decisions needs to be made?
2. What data is needed to inform those decisions?

## Step 2: Analysis, Modeling, and Validation

*Provide a description of how you set up your linear regression model, what variables you used and why, and the results of the model. Visualizations are encouraged. (500 word limit)*

***Important:******Use the p1-customers.xlsx to train your linear model.***

*At the minimum, answer these questions:*

1. How and why did you select the [predictor variables (see supplementary text)](https://classroom.udacity.com/courses/ud976/lessons/4e33b70a-72a4-47cb-959a-28632ae6aaff/concepts/631d190c-8626-4dd7-92df-f5bd96913c48) in your model? You must explain how your continuous predictor variables you’ve chosen have a linear relationship with the target variable. Please refer to this [lesson](https://classroom.udacity.com/nanodegrees/nd008/parts/c0b53068-1239-4f01-82bf-24886872f48e/modules/bf705147-0d7c-4492-842a-698a6410a8a3/lessons/4e33b70a-72a4-47cb-959a-28632ae6aaff/concepts/631d190c-8626-4dd7-92df-f5bd96913c48) to help you explore your data and use scatterplots to search for linear relationships. You must include scatterplots in your answer.
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.
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)

**Important: The regression equation should be in the form:**

*Y = Intercept + b1 \* Variable\_1 + b2 \* Variable\_2 + b3 \* Variable\_3……*

**For example:** Y = 482.24 + 28.83 \* Loan\_Status – 159 \* Income + 49 (If Type: Credit Card) – 90 (If Type: Mortgage) + 0 (If Type: Cash)

Note that we **must** include the 0 coefficient for the type Cash.

**Note**: For students using software other than Alteryx, if you decide to use Customer Segment as one of your predictor variables, please set the base case to Credit Card Only.

## 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?
2. How did you come up with your recommendation? (Please explain your process so reviewers can give you feedback on your process)
3. What is the expected profit from the new catalog (assuming the catalog is sent to these 250 customers)?

Before you Submit

Please check your answers against the requirements of the project dictated by the [rubric](https://review.udacity.com/#!/rubrics/186/view) here. Reviewers will use this rubric to grade your project.