Project: Diamond Prices

Complete each section. Then save your file as a PDF document and submit it here: https://classroom.udacity.com/nanodegrees/nd008/parts/235a5408-0604-4871-8433-a6d670e37bbf/project#

Step 1: Understanding the Model

Answer the following questions:

1. According to the linear model provided, if a diamond is 1 carat heavier than another with the same cut and clarity, how much more should we expect to pay? Why?

    - The one additional carat would result in an additional $8413 in price. The formula created by the regression determined that the coefficient for a carat is 8413.0, so for every increase in the number of carat the price will increase by the amount of the coefficient.

2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?

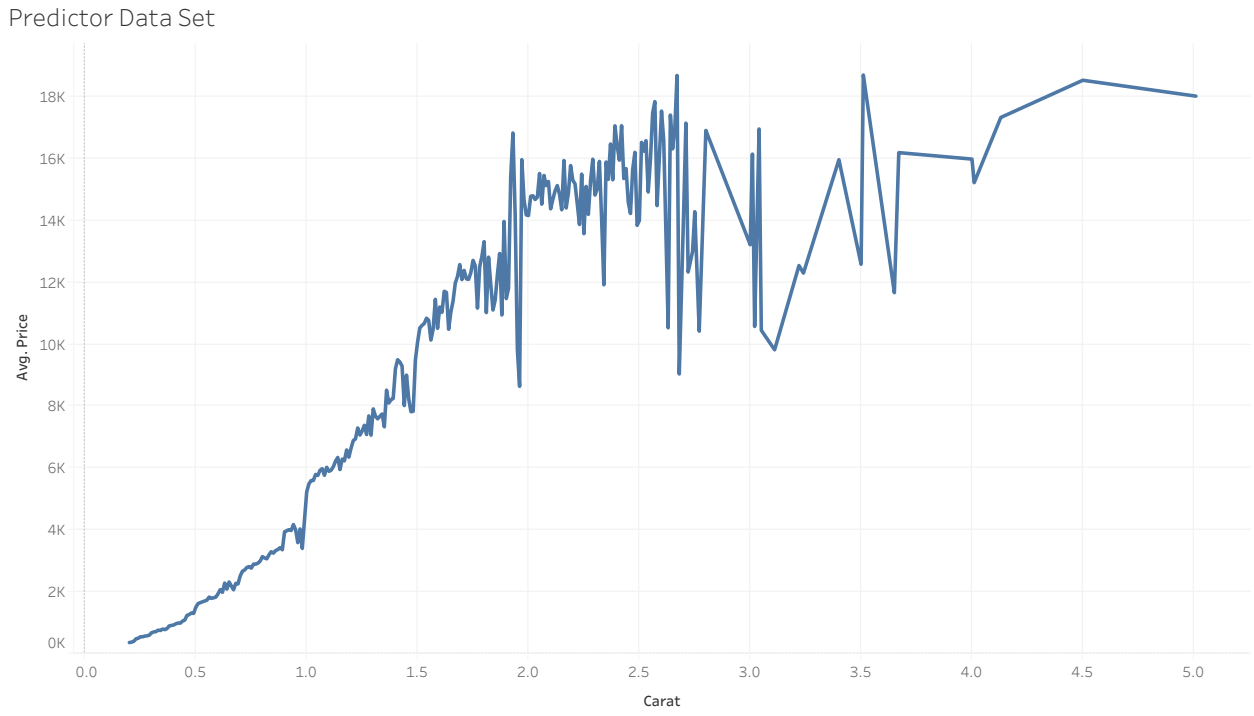
    - This diamond would retail for 10094.8 apart putting the respective values in the regression equation.
    - The formula is price = -5,269 + 8,413 x Carat + 158.1 x Cut + 454 x Clarity
        - so now we will plug in the values for the different variables.
        - Price = -5,269 + 8,413 x 1.5 + 158.1 x 3 + 454 x 5
        - Price = 10094.8

Step 2: Visualize the Data

Make sure to plot and include the visualizations in this report. For example, you can create graphs in Excel and copy and paste the graphs into this Word document.

1. Plot 1 - Plot the data for the diamonds in the database, with carat on the x-axis and price on the y-axis.

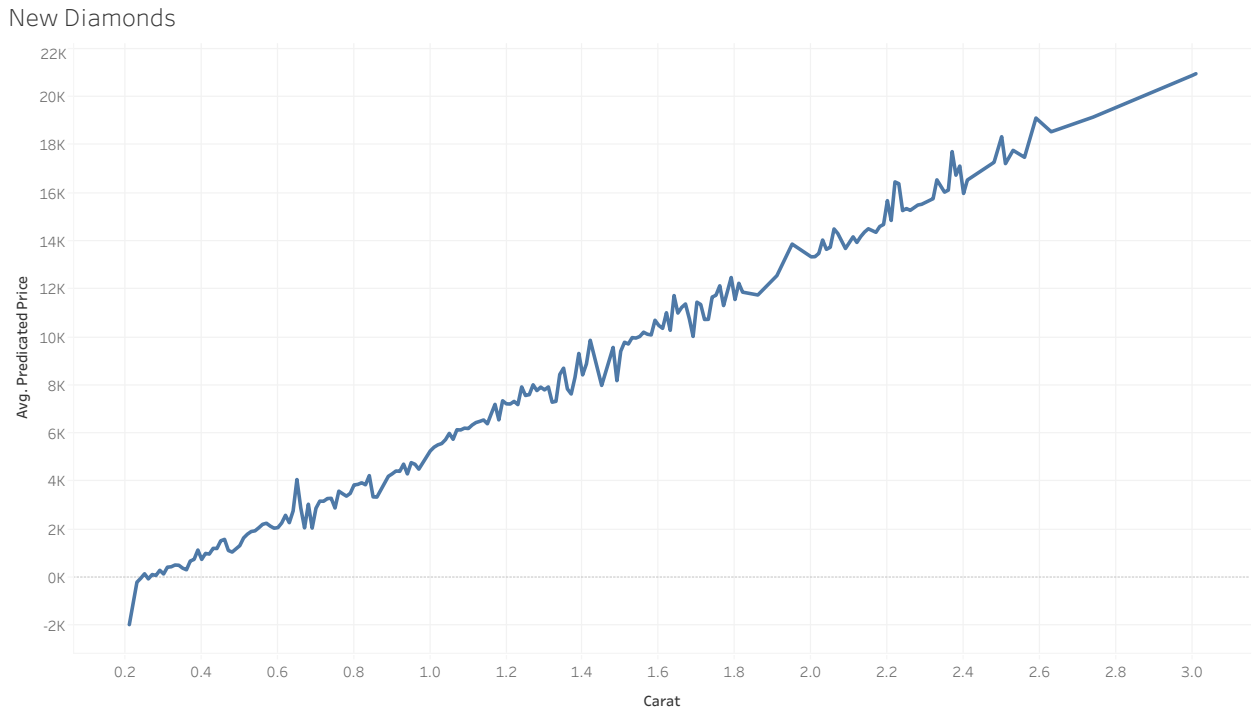
I have used Tableau to plot the average price at each carat value.



The trend of average of Price for Carat.

2. Plot 2 - Plot the data for the diamonds for which you are predicting prices with carat on the x-axis and predicted price on the y-axis.
    - **Note**: You can also plot both sets of data on the same chart in different colors.

I have used Tableau to plot the average price at each carat value.



The trend of average of Predicated Price for Carat.

3. What strikes you about this comparison? After seeing this plot, do you feel confident in the model's ability to predict prices?

The predicted value line is almost a linear straight line. Also, the slopes of both predictor and predicted prices seem similar. So, we can figure out that the range of the predicted diamond prices would be close to the actual.

Step 3: Make a Recommendation

Answer the following questions:

1. What price do you recommend the jewelry company to bid? Please explain how you arrived at that number. HINT: The number should be 7 digits.

    a. I recommend a bid of $82,13,466.
    b. I arrived at this number by using a formula from the regression model provided that was based on previous diamond prices and applied it to the diamonds that were up for bid. This resulted in a predicted market price of $11,733,523
    c. I then factored in the information that company generally purchases diamonds from distributors at 70% of that price.
    d. So, I multiplied the predicted market price $11,733,523 by 0.70 to get the final predicted bid of $8,213,466