Project: Diamond Prices

Complete each section. When you are ready, save your file as a PDF document and submit it in your classroom.

Step 1: Understanding the Model

Answer the following questions:

1. According to the model, if a diamond is 1 carat heavier than another with the same cut, how much more should I expect to pay? Why?
   - If a diamond is 1 carat heavier than another with the same cut, you should expect to pay $8,413.00 more. This is because, other things being equal, a unit change in carat will result in a change to the extent of its coefficient (8,413 in this case). Hence a unit increase in in carat will result in an $8,413 corresponding increase in price

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?
   - If you were given the above predictors, you should expect to pay about $10,094.80 for it. This is broken down as follows:
     - Formula: Price = -5,269 + 8,413*Carat + 158.1*Cut + 454*Clarity. When the variables are inserted in place of the headers, we will have
     - Price = -5269+(8413*1.5)+(158.1*3)+(454*5)
     - Price = $10,094.80

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

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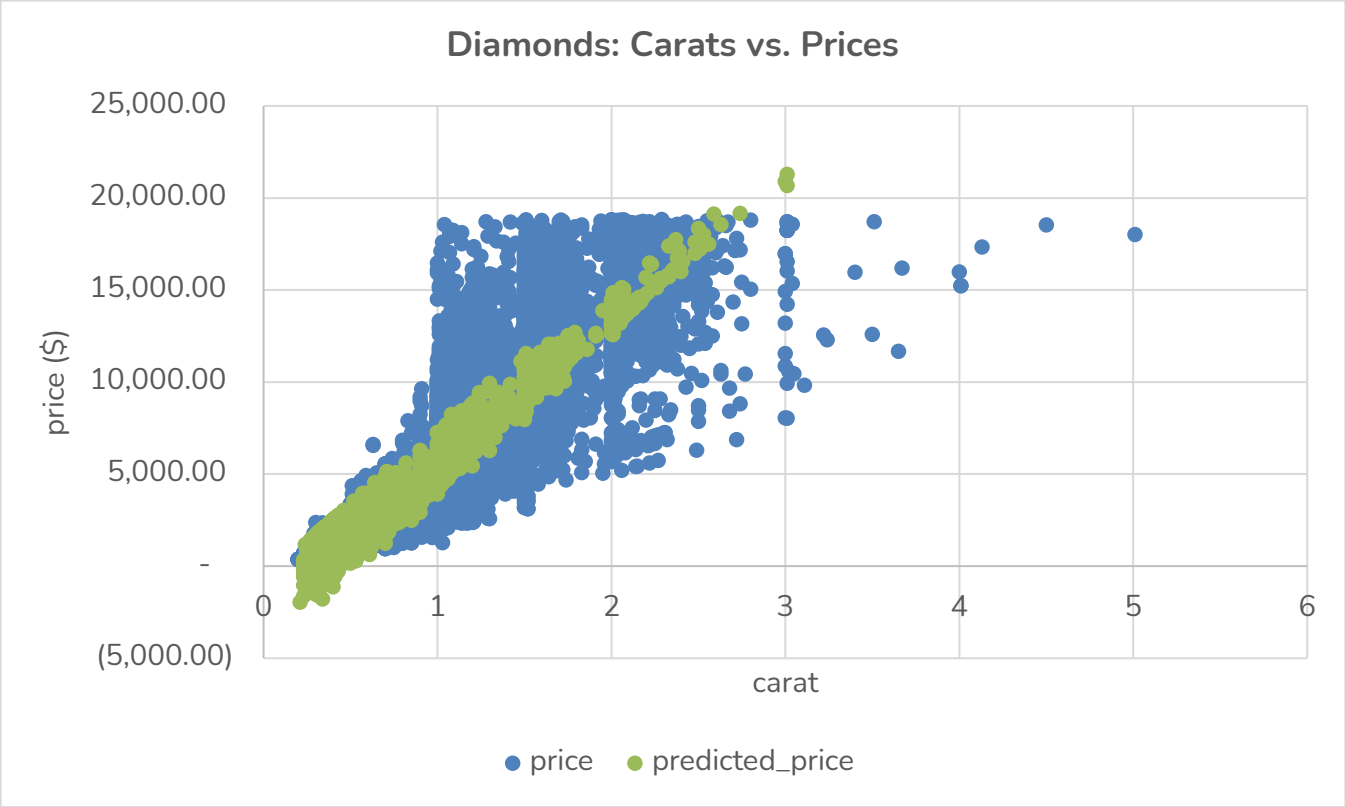

Both datasets show a positive correlation between carats and prices. The old dataset, however, has a fairly higher spread (and outliers) than the new dataset. The new dataset is quite compact near the first quarter, but spreads a little as carats increase.

After seeing this plot, I feel confident in the model's ability to predict prices despite a number of outliers. It must be noted that the three factors used are not the only ones that affect prices in reality, hence more consideration when making decisions.

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.
   - I recommend that the jewelry company bids $ 8,213,465.93 for the diamonds. This was arrived at by multiplying the 70% purchase standard by the total predicted value of the diamonds ($11,733,522.76).