Project: Diamond Prices

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?

    - One additional Carat will increase price by $8,413. In the given regression formula, Carat's coefficient is 8413, so for every increase in the number of Carats the price will increase by the amount of coefficient.

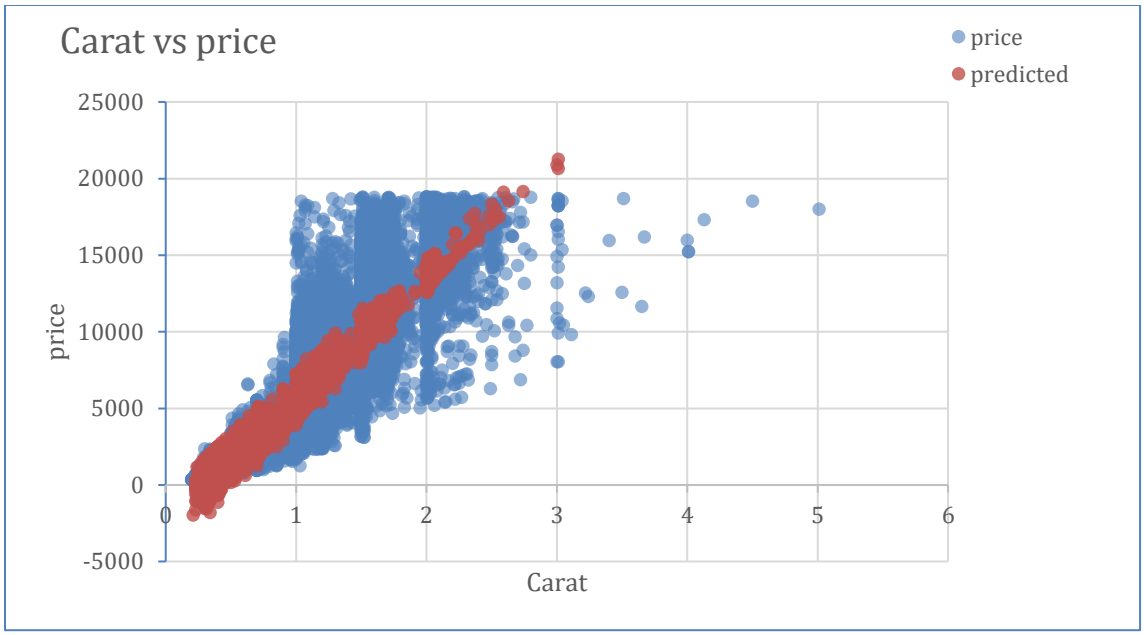
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?

    - The formula is price = -5,269 + 8,413 * Carat + 158.1 * Cut + 454 * Clarity
        i. so now we will plug in the values for the different variables.
        ii. Price = -5,269 + 8,413 * 1.5 + 158.1 * 3 + 454 * 5
        iii. 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.
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?



in blue we have the actual prices and in red the prices predicted by the model

The idea here is to see that the predicted prices are in a much narrower range than actual prices (i.e. they are less spread out). This reinforces the fact that there are likely other factors omitted from the model that would help improve our accuracy.

We can also see that, although the model can do a good job on average, for any particular diamond the forecast may be very wrong, including negative predictions.

With this in mind, while I would not be confident using the model to come up with the price for a single diamond, it can still be useful to recommend the bid price for the whole set of diamonds.

As we are talking about a large number of diamonds, this would allow for the errors to average out which results in a good level of confidence in the final price predicted.

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 a bid of $8,213,466. I arrived at this number by using a formula from the regression model provided that was based on previous diamond sales and applied it to the

Carats that were up for bid. Then I multiplied it with price that company is usually buys i.e., 70%. So, I multiply the predicted amount 11733523 by .70 to get the final predicted bid of $8,213,466.