Project: Diamond Prices Prediction

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?
    - As per the model, if the diamond is heavier then 1 carat with same cut and clarity, then we have to pay $8413 more, since the formula created by regression determined that the coefficient of carat is 8413, and if there is a difference in clarity then the additional amount paid is (8413 + (454 * difference in clarity)).
    - For every increase in the carat and clarity, price will increase by coefficient of Carat if cut and clarity are same else coefficient of Carat plus difference of clarity multiply by 454 if clarity is different.

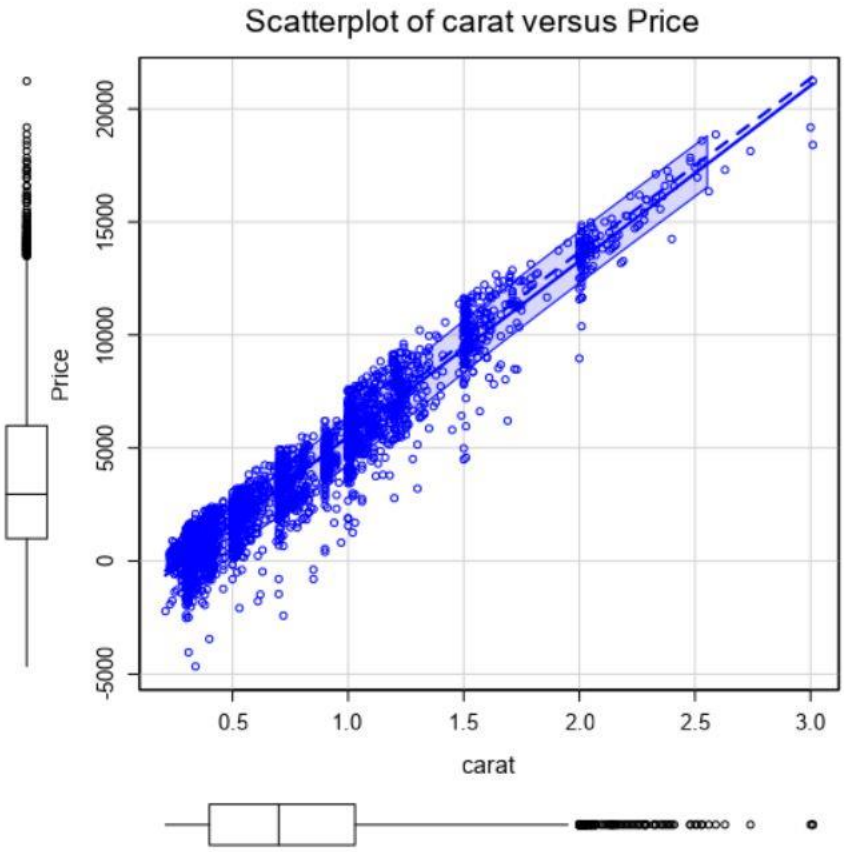
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?
    - **The formula to predict the price is:**
      Price = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity**
    - We will substitute the values in formula as below:
      Price= -5269 + 8413 * 1.5 + 158.1 * 3 + 454 * 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.
    - 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.



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

    - The predicted prices and actual prices have a lot of differences when we just plot them Carat Vs Price, but somewhere we found that it worked and

gives an approximate result. This is because, we are not considering each aspect of the model that is actually affecting the price. For every single carat diamond, it has multiple prices. There are other things apart from carat to consider such as Clarity and cut.

- After looking at this plot the model appears on average to predict the prices, but it can be a loss for certain carat diamonds. There appears to be an outlier diamond with less than 0.5 carat but as per the prediction it will be sold for a negative price which is a loss. While the formula may not be accurate for an individual carat diamond, it should do a decent job at predicting the price we should bid for several diamonds at once since it on average looks representative.

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 $ 117733522.76. 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 diamonds that were up for bid. I have summed the price to get the final predicted bid of $ 8213465.93