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?
   You should expect to pay 8,413 dollars more. According to the regression model, each additional carrot carries a weight of 8,413 dollars to be added to the price.

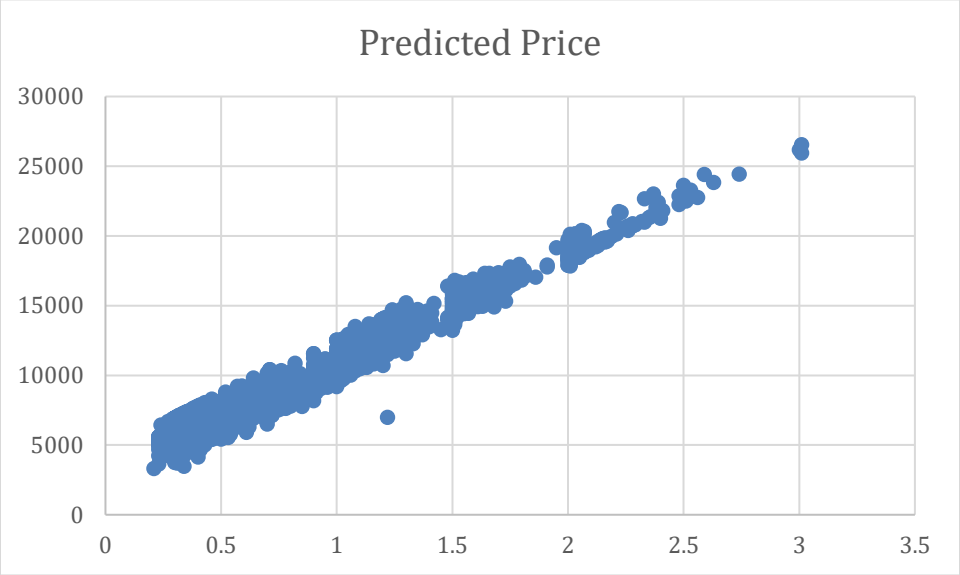
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?
   By plugging in the number into the regression formula, you should expect to pay 10,094.8 dollars.

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?
   The predictions in price have a lot less variance than the actual prices with respect to carat. Two causes stick out in my mind: there could be a huge difference in the variance of the other two factors (cut and clarity) between the test and training set and/or the simple linear regression model is not the best model for this dataset.

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.
   Since the jeweler needs to purchase the diamonds at 70% of their retail value, I summed all the predicted prices and multiplied by 70% or 0.7. The resulting price is 19,274,677.63 dollars.