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?

If a diamond is 1 carat heavier than another with the same cut, the predicted price would be $8,413 more. We should bid 70% of that so the expected bid should be $5889.10 more than the lighter diamond.

1. 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?

Using the formula given by the linear regression model, the predicted price of the diamond would be calculated as: -5,269 + (8,413 \* 1.5) + (158 \* 3) + (454 \* 5) = $10,094.50. We should bid 70% of this, or $7,066.15

# 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 slope of the new diamond prices matches fairly similarly to the prices of the initial diamonds that we currently own, however there are some diamonds that have a negative predicted price. This would not be possible in real life, so while the model is somewhat useful to use to set a bid, it is difficult to trust the model too much. Other factors such as cut clarity, ,and color are not present in the scatter plot.

# 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 would recommend the company bid $8,213,464.45. To get this number, we took 70% of the total predicted diamond prices without removing negative values.