

Project: Diamond Prices

Step 1: Understanding the Model

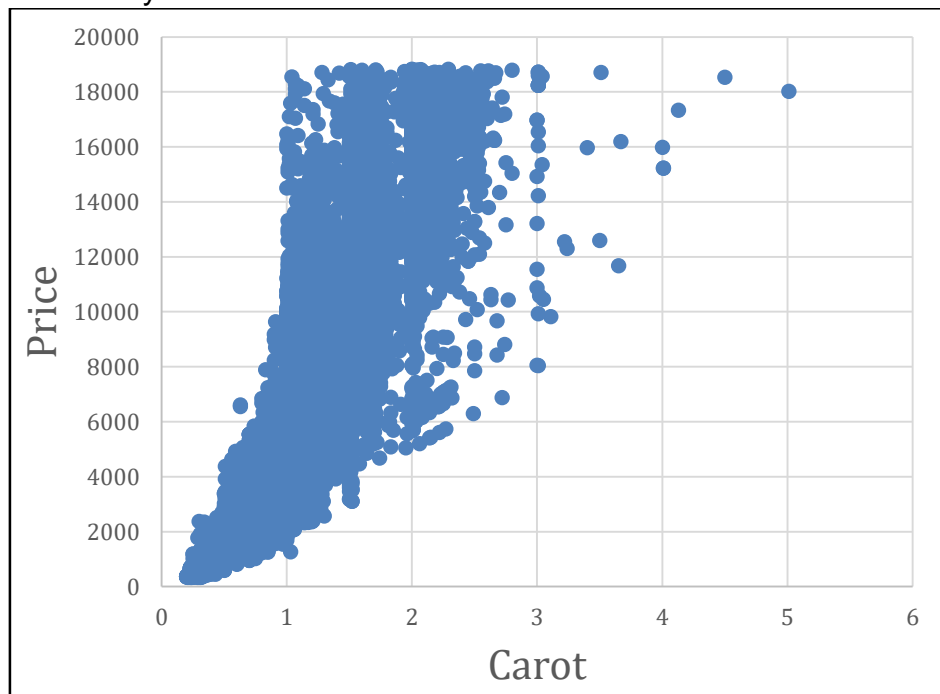
Answer the following questions:

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?
 - You will need additional \$8413 in price. In the prediction formula, the coefficient for carat is 8413. That is to say, for every 1-unit increase in carat will cause \$8413 extra price in prediction.
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?
 - According to the model, you will need to pay \$10095 for it.

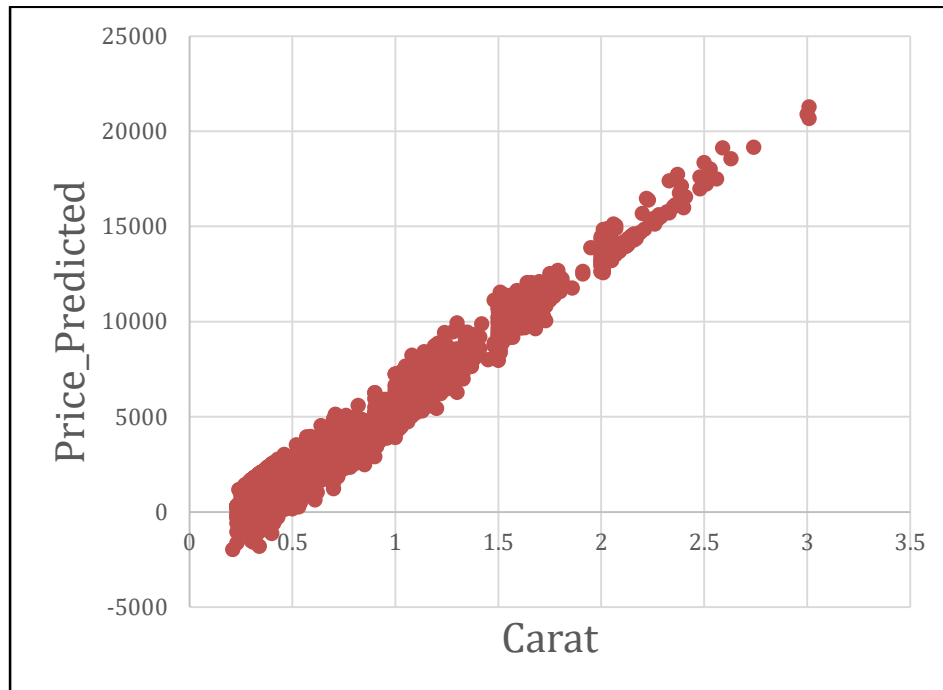
Step 2: Visualize the Data

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.



3. What strikes you about this comparison? After seeing this plot, do you feel confident in the model's ability to predict prices?
 - At a first glance, the prediction is linear distribution but actual price data is non-linear, closer to exponential/polynomial distribution, especially in carat in interval 1 and 2. In addition, some predicted prices is negative. It's really unreasonable. Maybe we should define the scope that this model is applicable.

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.
 - \$8213466 is recommended. I derived this number by summing up the predicted prices calculated through the linear regression model. Considering 20% margin, I also multiply the predicted amount by .80 to get this final predicted bid.