

Project: Diamond Prices

Step 1: Understanding the Model

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?

Answer:

As the equation implies:

$$\text{Price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$$

We take:

$$\text{diamond 1} = -5,269 + 8,413 \times (\text{Carat}=1) = 3144$$

$$\text{diamond 2} = -5,269 + 8,413 \times (\text{Carat}=2) = 11557$$

$$\text{Difference} = 11557 - 3144 = 8143$$

*For each carat increase, there will be **8,143 \$** increase in 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?

Answer:

As the equation implies:

$$\text{Price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$$

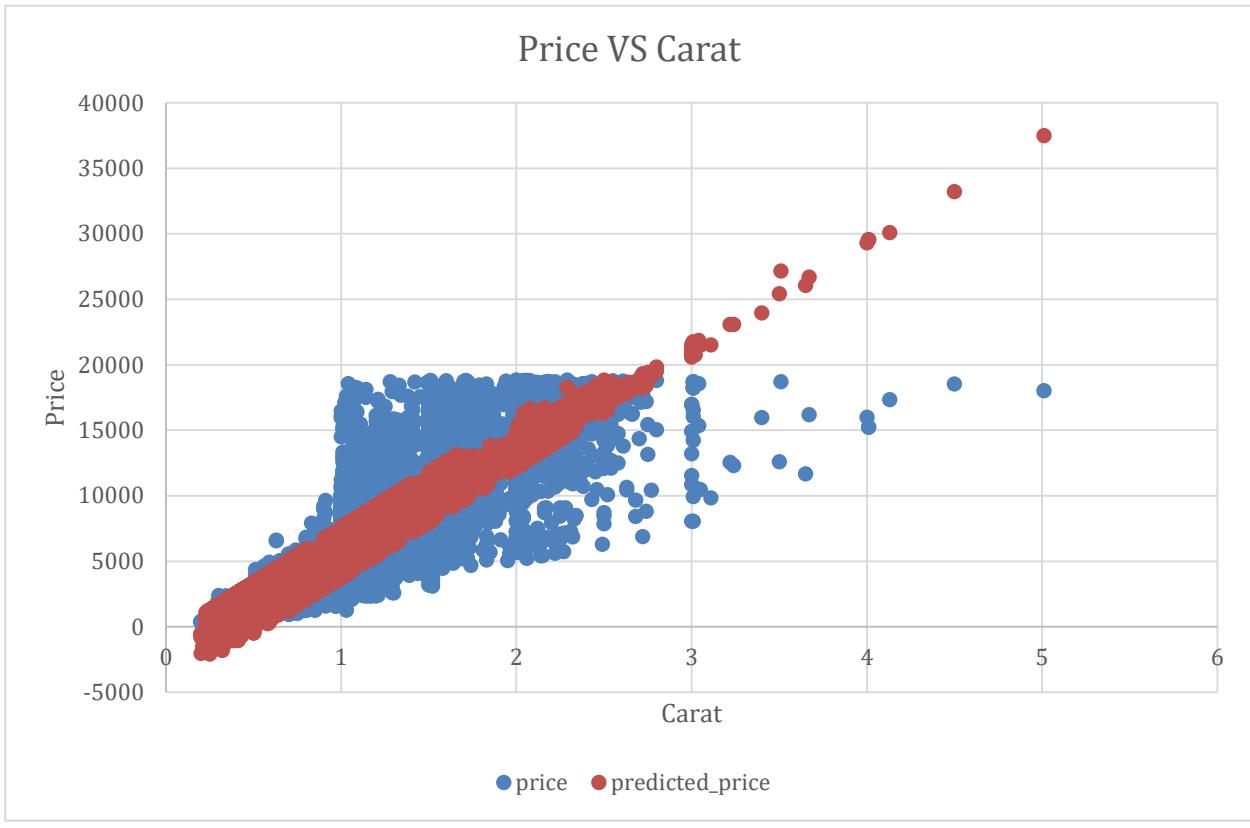
You should pay:

$$\text{Price} = -5,269 + 8,413 \times 1.5 + 158.1 \times 3 + 454 \times 5 = \$ 10,094.80 \text{ \$}$$

Step 2: Visualize the Data

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.
 - o **Note:** You can also plot both sets of data on the same chart in different

Answer:



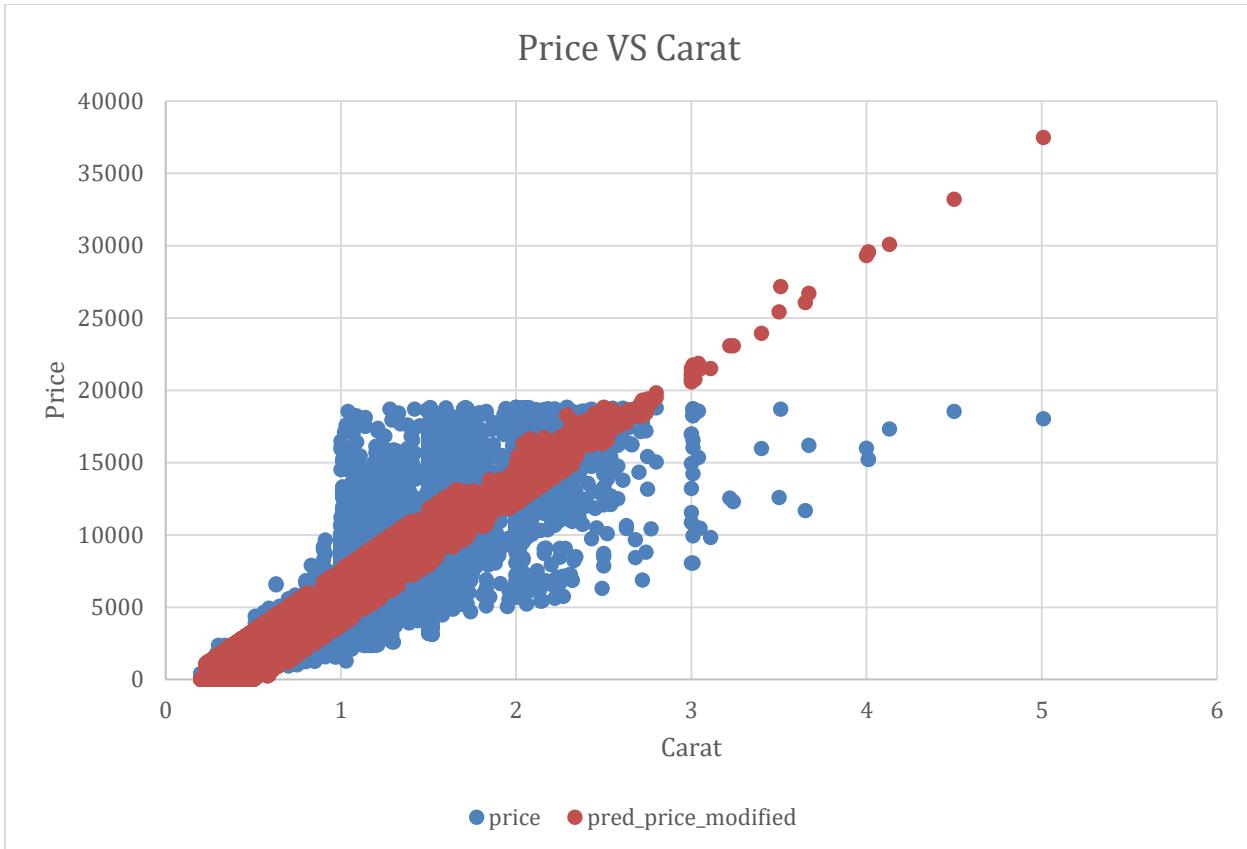
o colors.

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

Answer:

- 1- *There are negative values in the predicted prices, it does not make sense.*
- 2- *The gap increases when the carat is more than 3. Which means the model confidence is becoming low when the carat is more than 3.*

Scatter plot without negative values:



Step 3: Make a Recommendation

1. What price do you recommend the jewelry company to bid? Please explain how you arrived at that number.

Answer:

First, I calculated the predicted prices using the proposed equation

Then, I removed the negative values, I put zeros instead

Lastly, I multiplied the predicted price by 0.7 because as mentioned in project description “The company generally purchases diamonds from distributors at 70% of that price”

The bid amount is \$ 8,309,267.72