

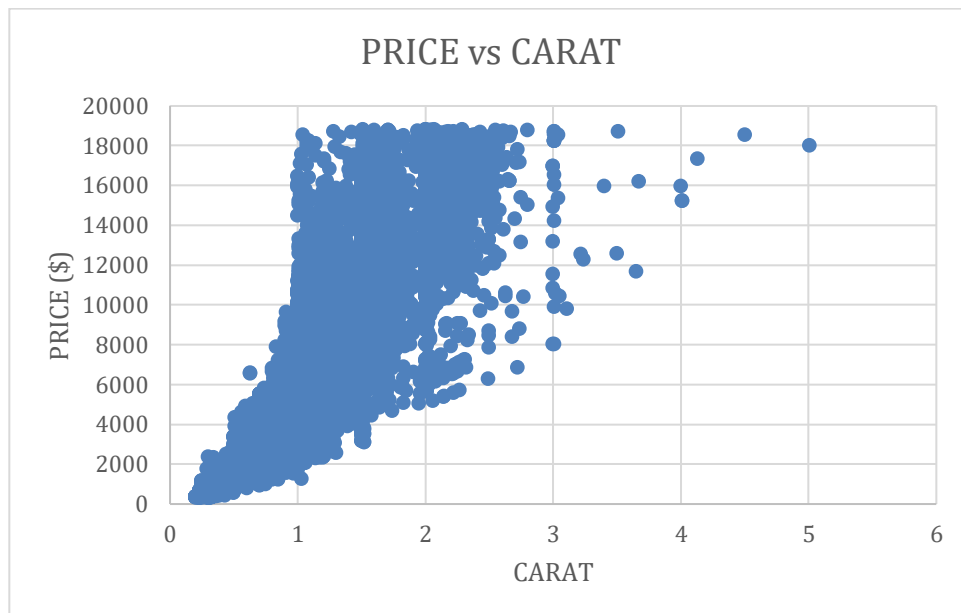
## Project: Diamond Prices

### Step 1: Understanding the Model

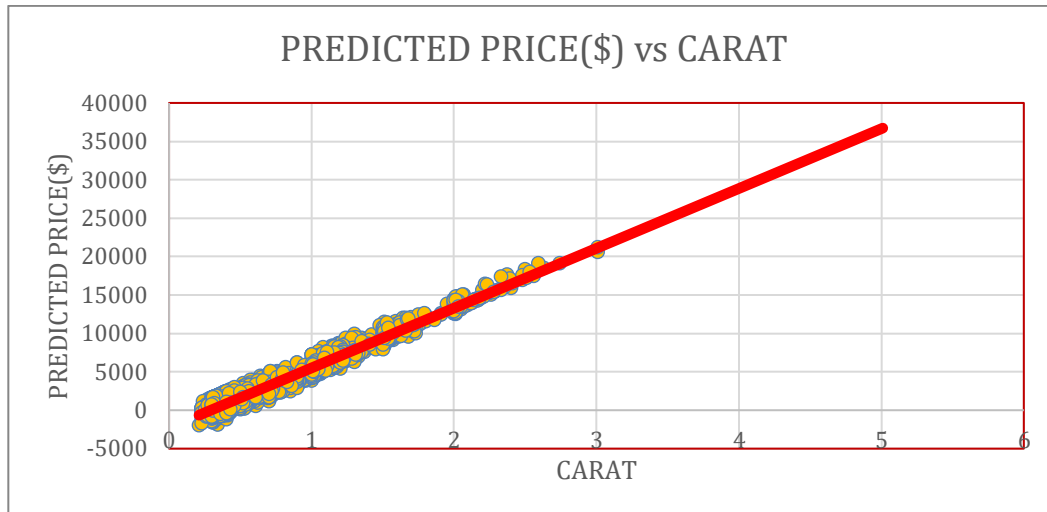
- According to the model, if a diamond is 1 carat heavier than another with the same cut, how much more should I expect to pay? Why?
  - The one additional carat would result in an additional \$8413 in price. The formula created by the regression determined that the coefficient for a carat is 8413, so for every increase in the number of carats the price will increase by the amount of the coefficient.
- 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 is  $\text{price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$ 
    - after plugging in the values for the different variables.
    - $\text{Price} = -5,269 + 8,413 \times 1.5 + 158.1 \times 3 + 454 \times 5$
    - $\text{Price} = 10094.8$

### Step 2: Visualize the Data

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.



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

After looking at these plots the model appears to predict the prices ok. But there are negative predicted prices for some of the diamonds. While the formula may not be accurate for an individual diamond, it should do a decent job at predicting the price jewelry company should pay for a group of diamonds at once since it on average looks representative.

## Step 3: Make a Recommendation

*Answer the following questions:*

- What price do you recommend the jewelry company to bid? Please explain how you arrived at that number.
  - I recommend a bid of \$8,213,465.93. 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 then factored in the margin the jewelry company was looking for which was 30% so I multiply the predicted amount 11,733,522.76 by .70 to get the final predicted bid of \$8,213,465.93