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?
    - The one additional carat would result in an additional $8,413 in price. The formula created by the regression determined that the coefficient for a carat is 8,413, so for every increase in the number of carat the price will increase by the amount of the coefficient.

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?
    - The formula is **Price** = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity**
        - So now we will plug in the values for the different variables.
        - Price = -5,269 + 8,413 x **1.5** + 158.1 x **3** + 454 x **5**
        - Price = 10094.8

Step 2: Visualize the Data

1. Data of the diamonds in the database:

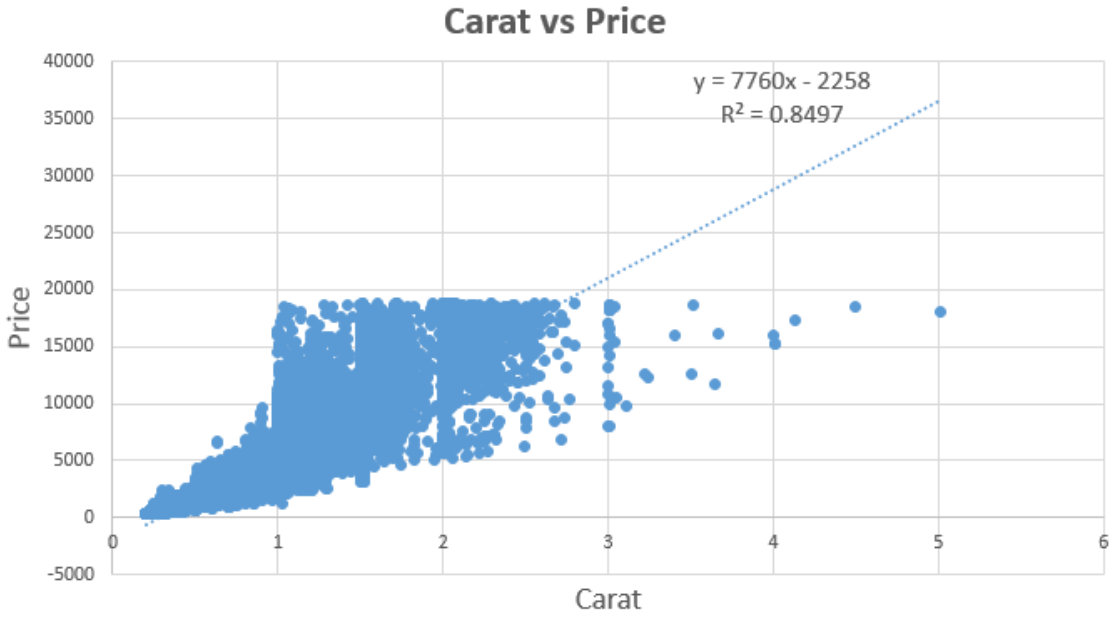

Figure 1: Scatterplot Carat vs Price

2. Data of the diamonds for which we are predicting prices:

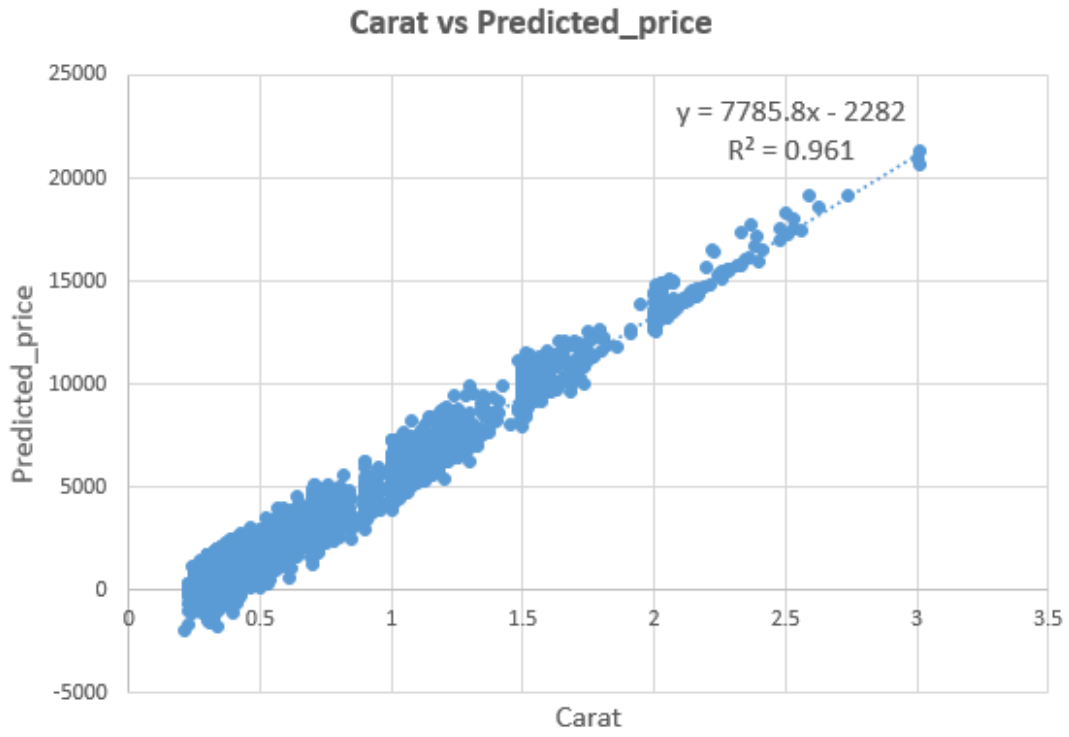

Figure 2: Scatterplot Carat vs Predicted_Price

3. What strikes you about this comparison?

    - Price increases with carat weight, but there's a lot of variation among diamonds of the same weight.
    - Some of the prices are predicted to be negative.

    After seeing this plot, do you feel confident in the model's ability to predict prices?

    - After looking at this plot the model appears on average to predict the prices ok, but it can be better.

Step 3: Make a Recommendation

1. 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 prices and applied it to the diamonds that were up for bid. The company generally purchases diamonds from distributors at 70% of that price, so I multiply the predicted amount by .70 to get the final predicted bid of $8,213,465.93.