Project: Diamond Prices

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(Please refer to the github repository of Project 1 and Project-Diamond-Prices.ipynb for detailed explanation)

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?

   Given the equation for the 3000 set of data is,

   Price = -5,269 + 8,413 x Carat + 158.1 x Cut + 454 x Clarity

   Expect to pay $8413 more if the diamond is 1 carat heavier.

   Based on the ML prediction done,

   The average difference of 1 carat is (9846.77 - 1491.8) = $8354.90 and (16842 - 9846.77) = $6995.23

   I should expect to pay around $7000 to $8000 more.

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?

   Based on the equation given, should pay $10094.80

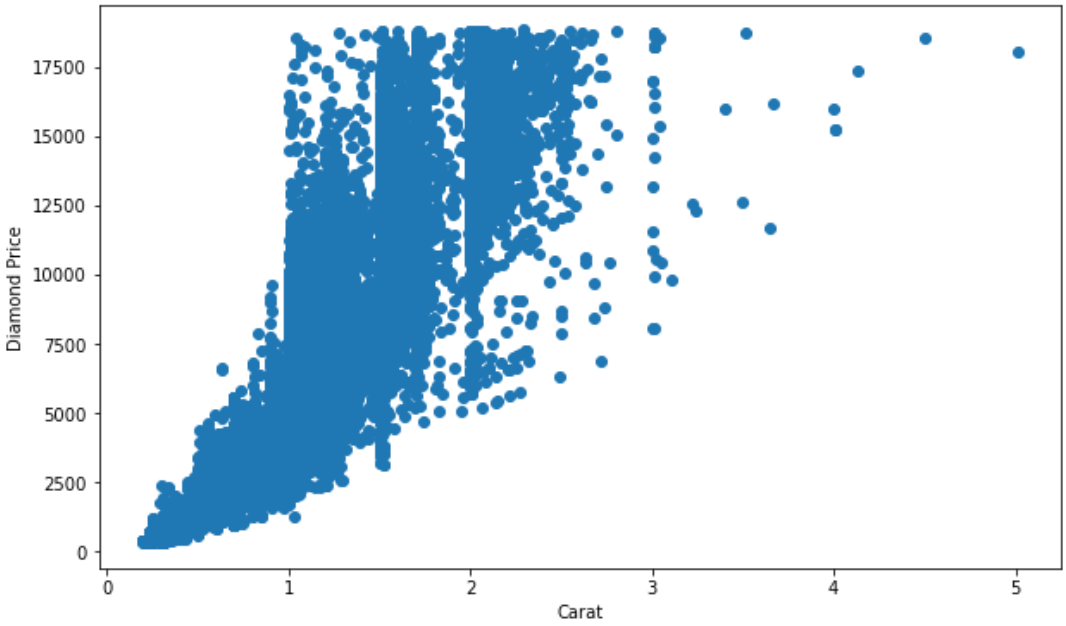
   Based on the ML prediction done,

   The predicted price for color D is 15262.50 and for color J is 7440.67

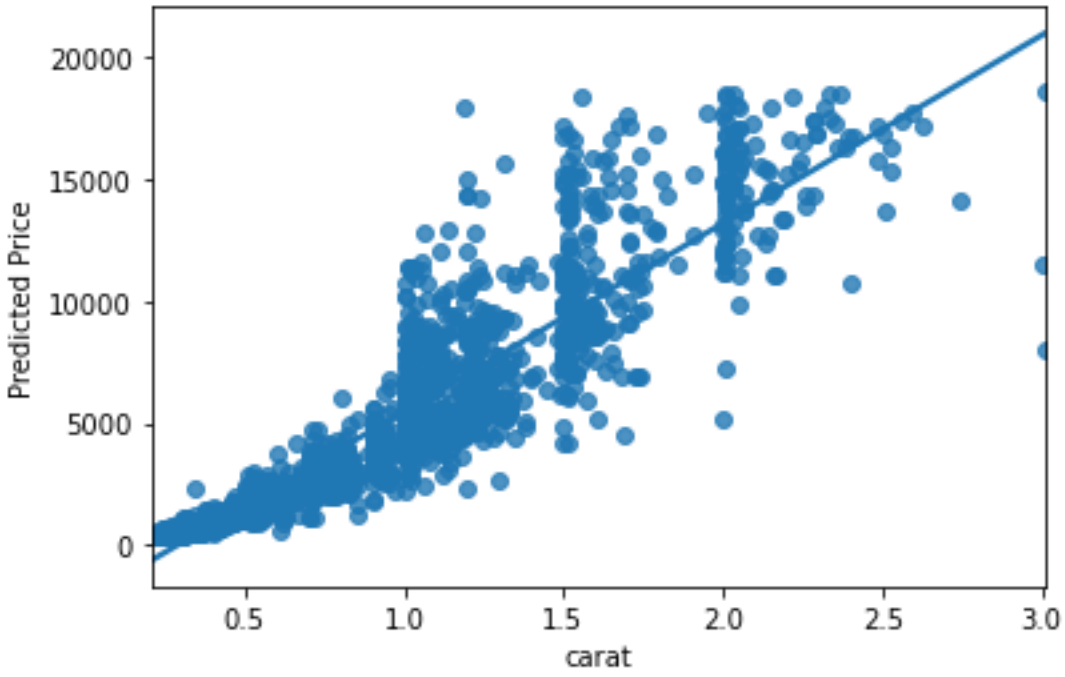
Step 2: Visualize the Data

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?

Yes, because Rsquare: 0.974167 is achieved by using Decision Tree Regressor and the scattered values are almost straightly plotted.

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.

   See the `predicted-diamonds-price.csv` for full predicted price value for each type of diamond and all the steps to arrive that predicted price is in this notebook.

   The full amount that they should bid is 70% of the full predicted price, which will be $8,186,617.47