Project: Diamond Prices

Complete each section. When you are ready, save your file as a PDF document and submit it here:
https://classroom.udacity.com/nanodegrees/nd008/parts/235a5408-0604-4871-8433-a6d670e37bbf/project#

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?

   If a diamond is 1 carat heavier than another with the same cut one would expect to pay 8,413 more.

   Reason:
   Given the model:

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

   Having 8,413 as the coefficient of the Carat variable in the equation signifies that every addition of 1 Carat results to an increase in price by 8,413 other factors held constant

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?

   Given the model:

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

   Substitute the model variables as follows:
   Carat = 1.5, Cut = 3, Clarity= 5
   Therefore:

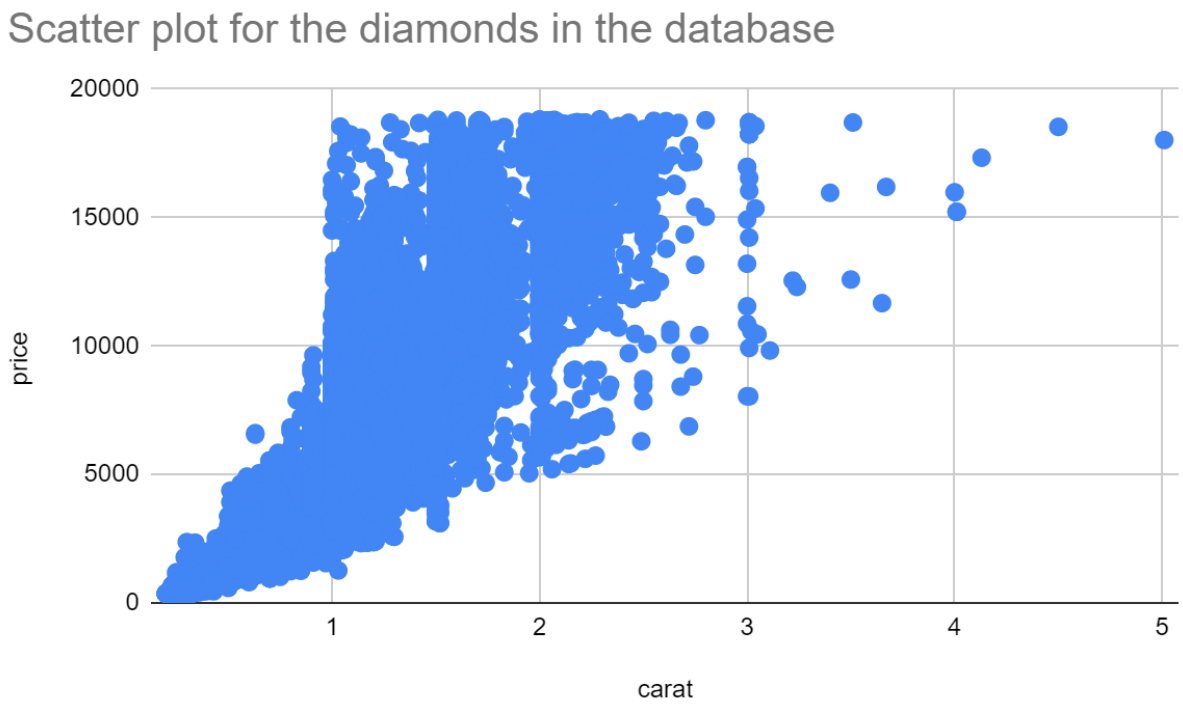
   Price = -5,269 + 8,413 x 1.5 + 158.1 x 3 + 454 x 5 = 10094.8

   The model predicts that you should pay 10094.80

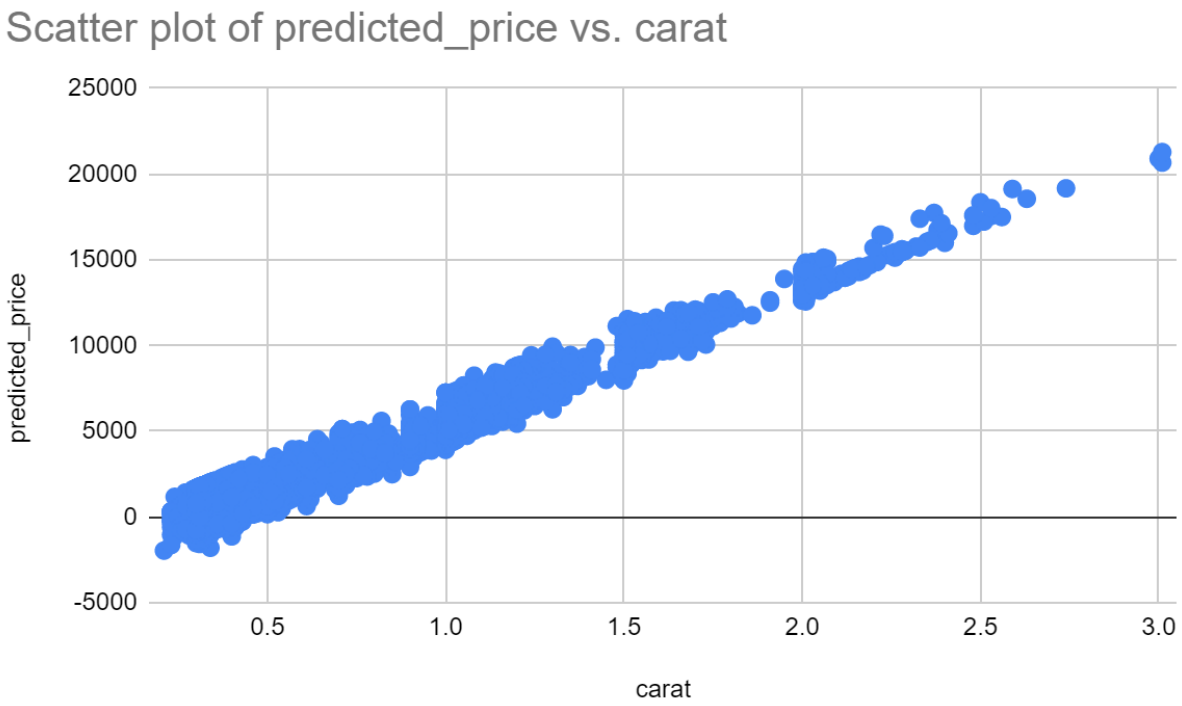
Step 2: Visualize the Data

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?

   The plot depicts that there exists significant correlation between the carat and price variables. Therefore the model can be reliably used to predict prices.

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.

   I recommend the jewelry company to bid at a price of 8,213,465.93
   Given the model:

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

   Using google sheets I ran the following formula for each row:
   = -5,269 + 8,413 x carat_field + 158.1 x cut_ord_field + 454 x clarity_ord_field

   On summing up the predicted_prices of all the diamonds it resulted to:

> 11,733,522.76

Therefore the bid price is calculated as:

11733522.76 x 0.7 = 8,213,465.93