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?

   Answer:

   According to the equation below:

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

   diamond_0 = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity**
   diamond_1 = -5,269 + 8,413 x (**Carat+1**) + 158.1 x **Cut** + 454 x **Clarity**
   difference = diamond_1-diamond_0=8,413

: Suggestion: Good job with the value. We can also just look at the coefficient of Carat to get our answer.

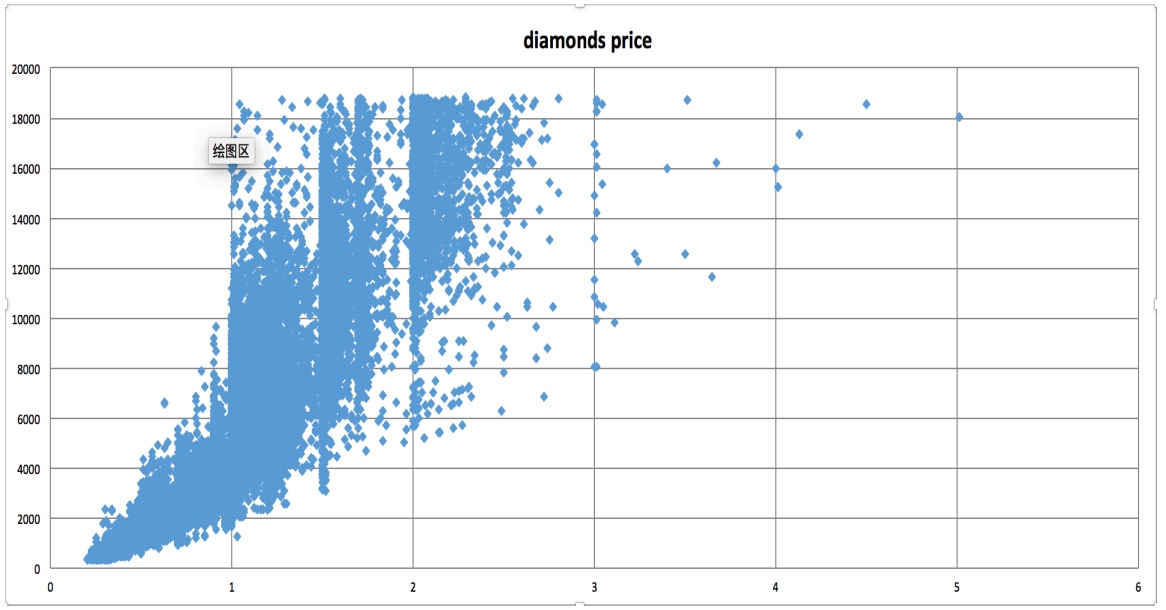
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?
   Price = -5,269 + 8,413 x **1.5** + 158.1 x **3**+ 454 x **5** = **10094.8**

: Awesome: Good job using the regression equation to get the right predicted price.

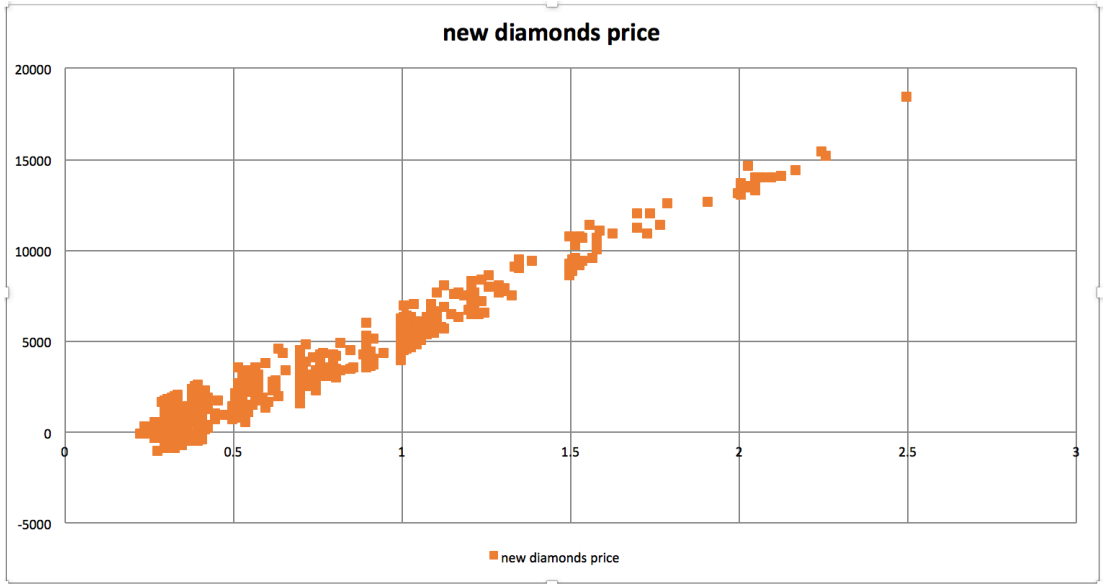
Step 2: Visualize the Data

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.



: Awesome: Good job with both the plots.

3. What strikes you about this comparison? After seeing this plot, do you feel confident in the model's ability to predict prices?
   In general, these two plot are similar price growth trend. However, the trend of diamonds is close to exponent curve and the trend of new diamonds is linear. I am not confident enough about the predicted price. It just give me a rough estimate of the result.

: Suggestion: While the model may not perform very well to set the price of each diamond, it can be somewhat useful to get the bid price.

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 8213465.93 for bid. I calculated the price of each diamond in the new-diamonds.csv table according the the equation: **Price** = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity. Then I summed up the price of all diamonds and I got the total price which is 11733522.76. Since the company generally purchases diamonds from distributors at 70% of the total price, I multiplied total price by 0.7. Finally, I got the bid which is** 8213465.93.

: Awesome: The bid price is exactly right!