

Project: Diamond Prices

Complete each section. When you are ready, save your file as a PDF document and submit it in your classroom.

Step 1: Understanding the Model

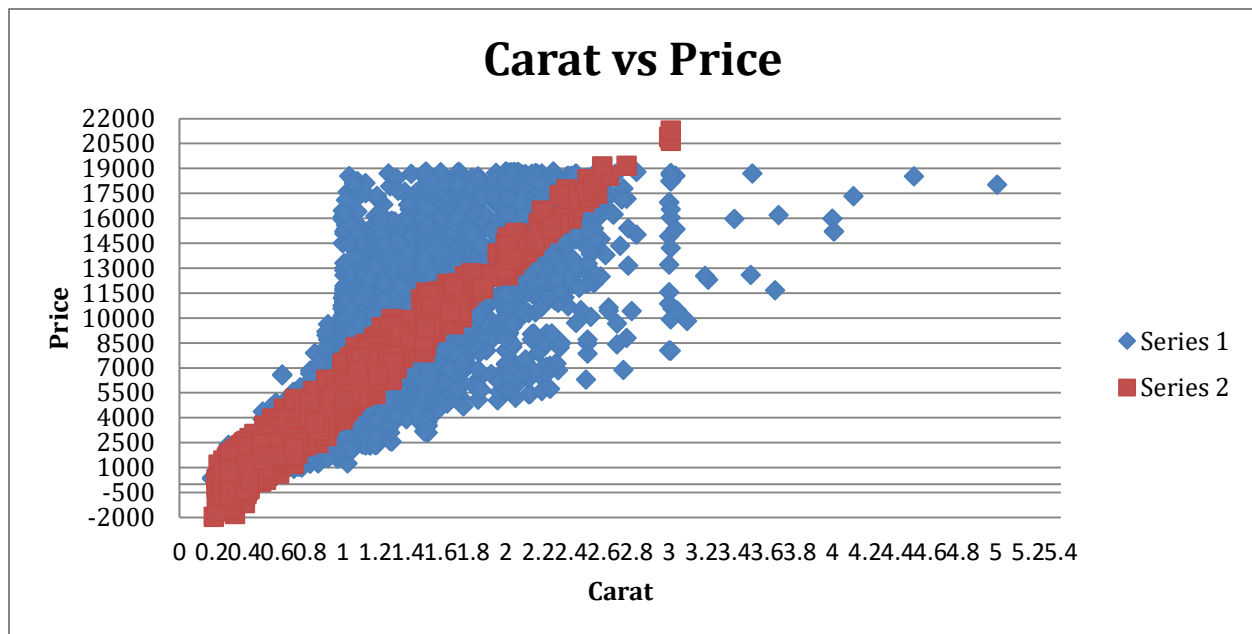
Answer the following questions:

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?
 - a. 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 8,413, so for every increase in the number of carats 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?
 - a. The formula is $\text{price} = -5269 + 8413 * \text{carat} + 158.1 * \text{cut_ord} + 454 * \text{clarity_ord}$
 - i. so now we will plug in the values for the different variables.
 - ii. $\text{Price} = -5269 + 8413 * 1.5 + 158.1 * 3 + 454 * 5$
 - iii. $\text{Price} = 10094.08$

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.
 - o **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?
 There seems to be a linear regression in predicted priced in the same way of past prices, but there seem to be some outliers in the past prices and that is not translated in the predicted prices.
 The percentage variation of the prices calculated with carat, cut and clarity in diamonds is 88%, but observing the plot it can be concluded that the model predicts better for smaller carats, then in medium sized diamonds.

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.
 - a. 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 that the company generally purchases diamonds from distributors at 70% of that price so I multiply the predicted amount 11733522.76 by .70 to get the final predicted bid of \$8,213,465.93