

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:

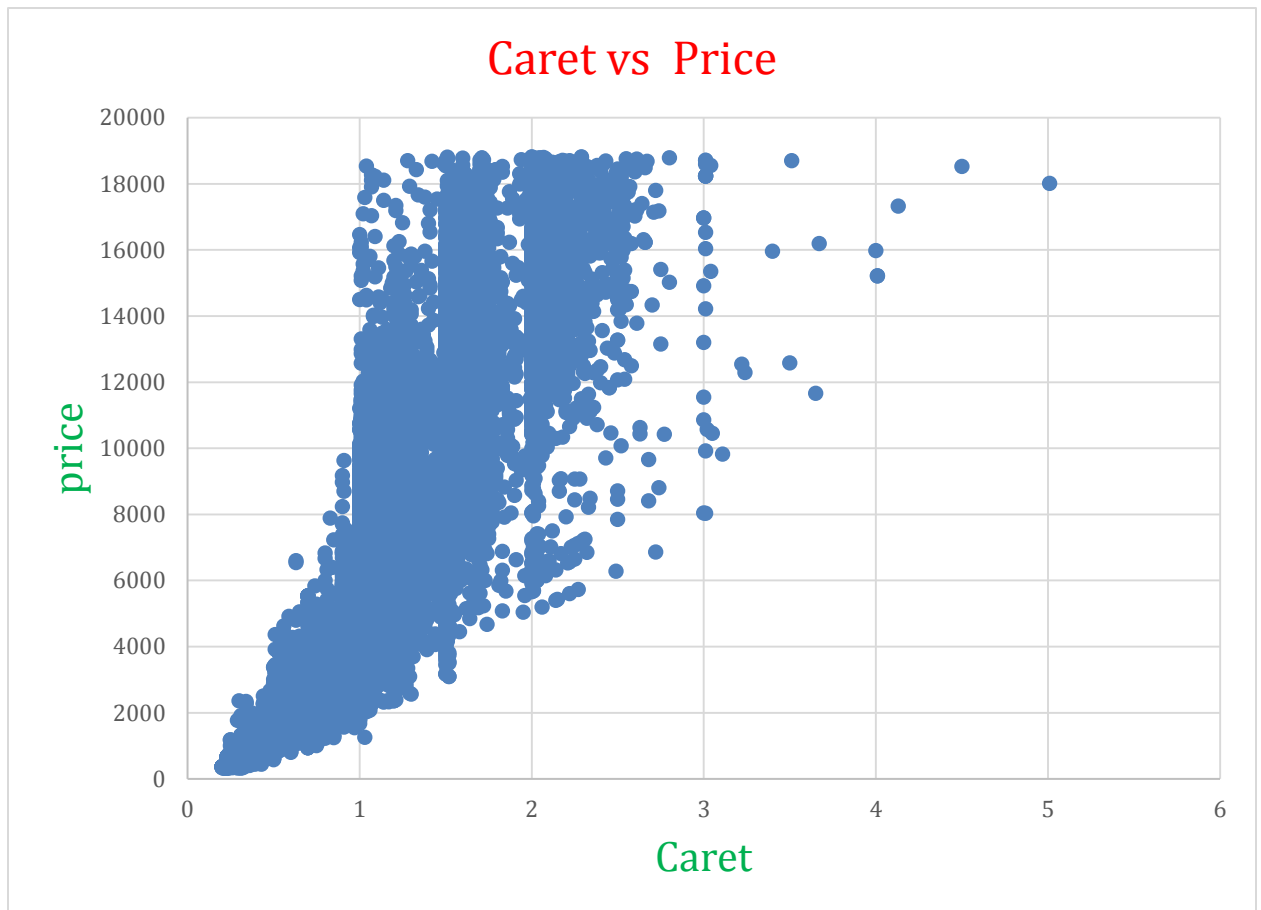
1. According to the model, if a diamond is 1 carat heavier than another with the same cut, how much more should I expect to pay? Why?
 - The increase of the carat value, leads to add extra **\$8,413** in price.
 - The formula for predicting diamond prices indicates that the Carat's coefficient is **8,413**, therefore for each 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: **Price = -5,269 + 8,413 x Carat + 158.1 x Cut + 454 x Clarity**
 - After substituting the variables with the given values
 - Price = $-5,269 + 8,413 \times 1.5 + 158.1 \times 3 + 454 \times 5$
 - Price = **\$75381.5**

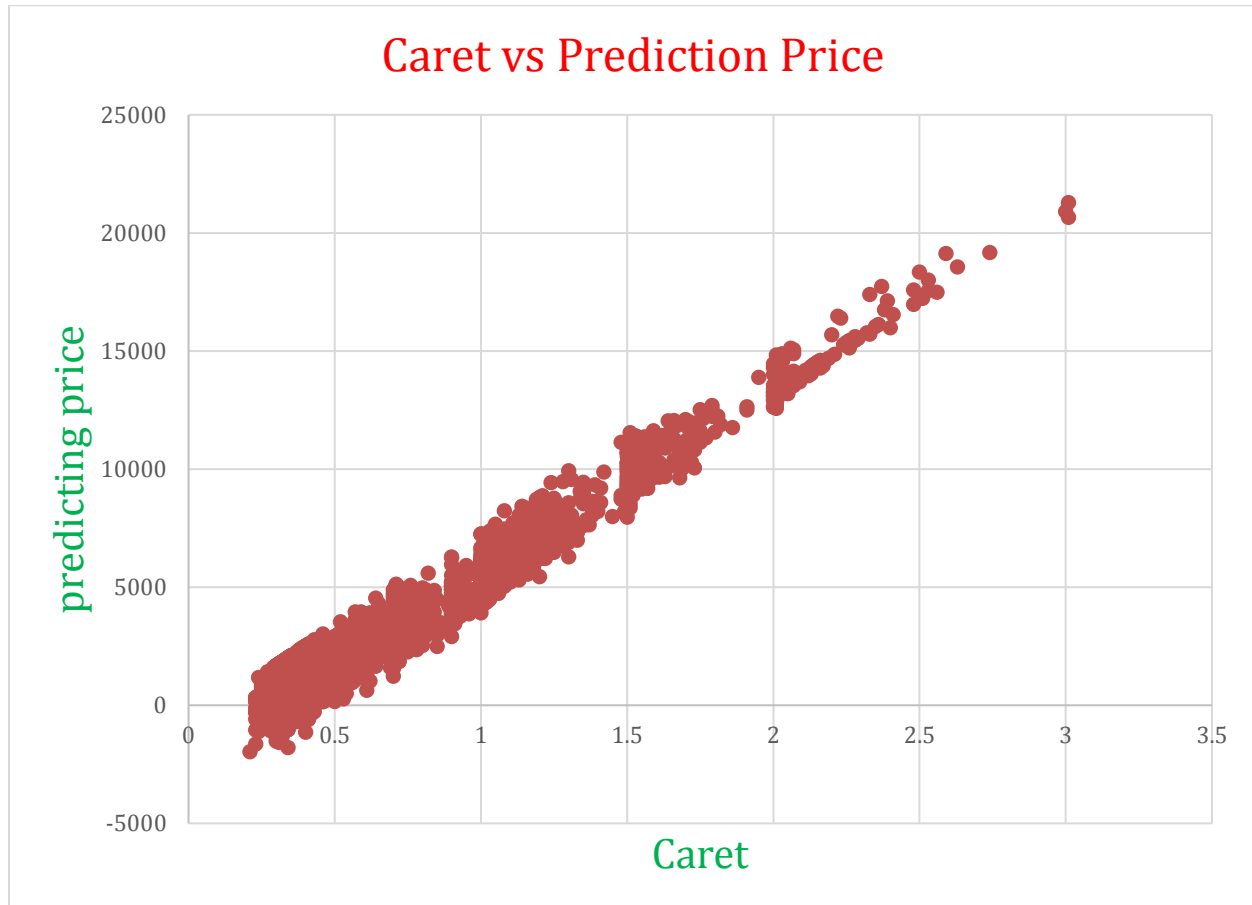
Step 2: Visualize the Data

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?
- There's a large prices variation of the same carat diamonds. For example, The prices of 2 Carat diamonds have ranged from \$5000 to \$18,000, which indicates that there's more variables affecting the price besides Carat. While the predict prices of the same Carat are close.
 - At the first glance, the model seems to be accurate, but there's prices in negative values which is not logical. Another concern is that, there are outliers diamonds. Such as the 3 Carat diamonds that cost more than \$200,000.

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.
 - The recommended price is **\$8213466.1**.
 - The number was obtained by:
 - calculating the predicted prices of the diamonds offered for bidding by using a formula of the regression model.
 - Find the total of diamonds' predicted prices, which is **11733523**
 - Extracting **70%** of the total by multiply **11733523** by **0.7**.
 - The result is **\$8213466.1**.