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?

   For every increase of carat's weight in the diamond, the price would increase by its coefficient which is 8413, given that the other variables are kept constant. So, if a diamond is 1 carat heavier, then the price would increase by $8413.

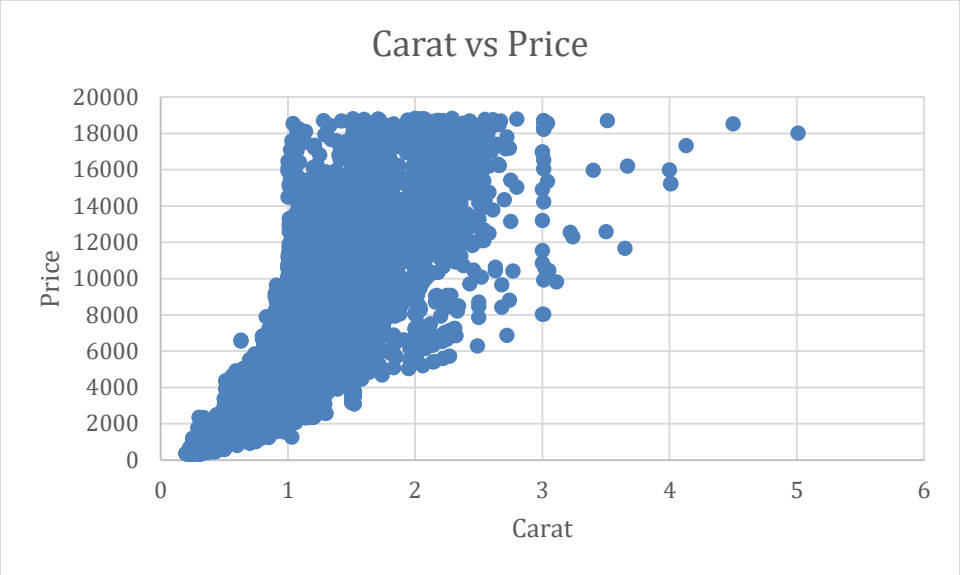
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?

   The formula to predict the price is; -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity**
   We'll replace the variables with its corresponding values in the above formula
   Carat: **1.5**
   Very Good Cut: **3**
   VS2 Clarity: **5**
   Predicted Price = -5,269 + 8,413 x **1.5** + 158.1 x **3** + 454 x **5** = **$10,094.8**

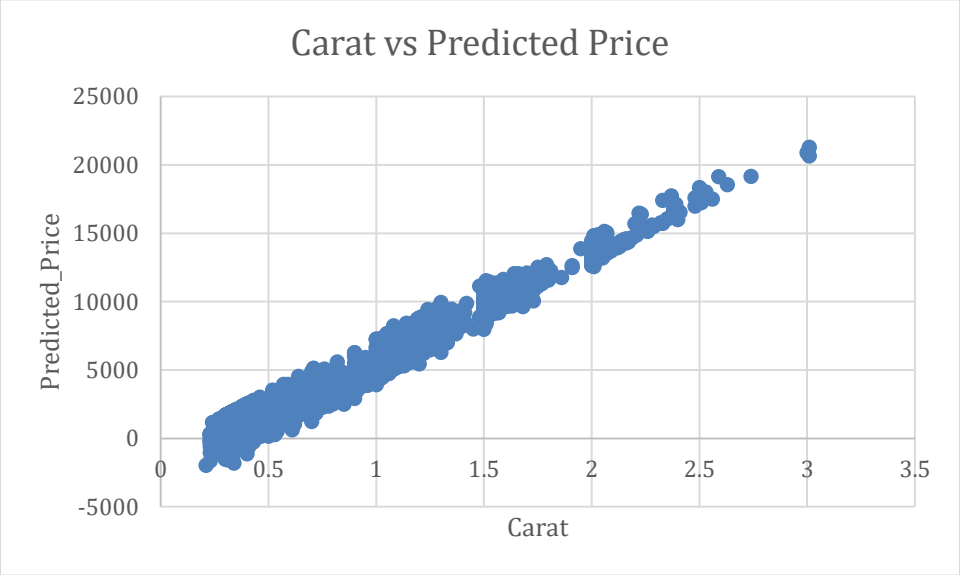
Step 2: Visualize the Data

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?

    From the graphs above, we can clearly see that carat and price have a positive correlation, which means that as the carat increases, the price also increases. But we do notice something odd in the second graph. In this graph, some prices are predicted to be in negative for the diamonds. Although the model seems to predict the prices ok, we cannot absolutely guarantee its precision as there might be more

factors than just carat, cut and clarity which might be affecting the prices. And that might be the reason for the negative values too. For all the diamonds with carat above 0.5, the results of the model seem to be quite reasonable.

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.

   My recommendation for the price bid would be $8,231,198. I have calculated this price by multiplying 0.7 with the sum of all the predicted prices, since the company generally purchases diamonds from distributors at 70% of the total price.

   Sum of all predicted prices = $11,758,854
   0.7 x $11,758,854 = $8,231,198