

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?

Since finding the Price = $-5269 + 8413 * \text{carat} + 158.1 * \text{cut} + 454 * \text{clarity}$, with the same cut and clarity we need **\$8,413 more**.

Andy: Your interpretation is correct! The idea here is to understand the interpretation of the coefficient. If we change a unit of any numerical variable the impact will be exactly the coefficient of the variable

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?

Since finding the Price = $-5269 + 8413 * \text{carat} + 158.1 * \text{cut} + 454 * \text{clarity}$ where;

Carat = 1.5 , Cut = 3, clarity= 5

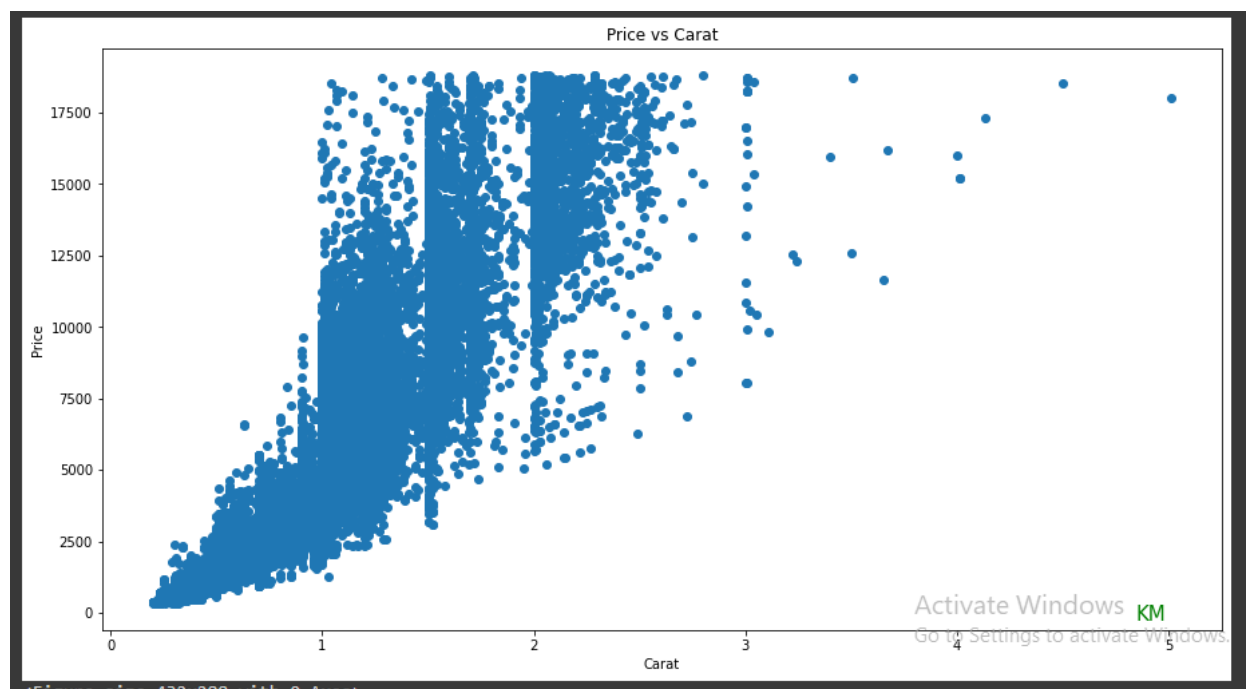
We find the Price = \$10094.8

Andy: The idea here is indeed to verify the application of the equation, well done!

Step 2: Visualize the Data

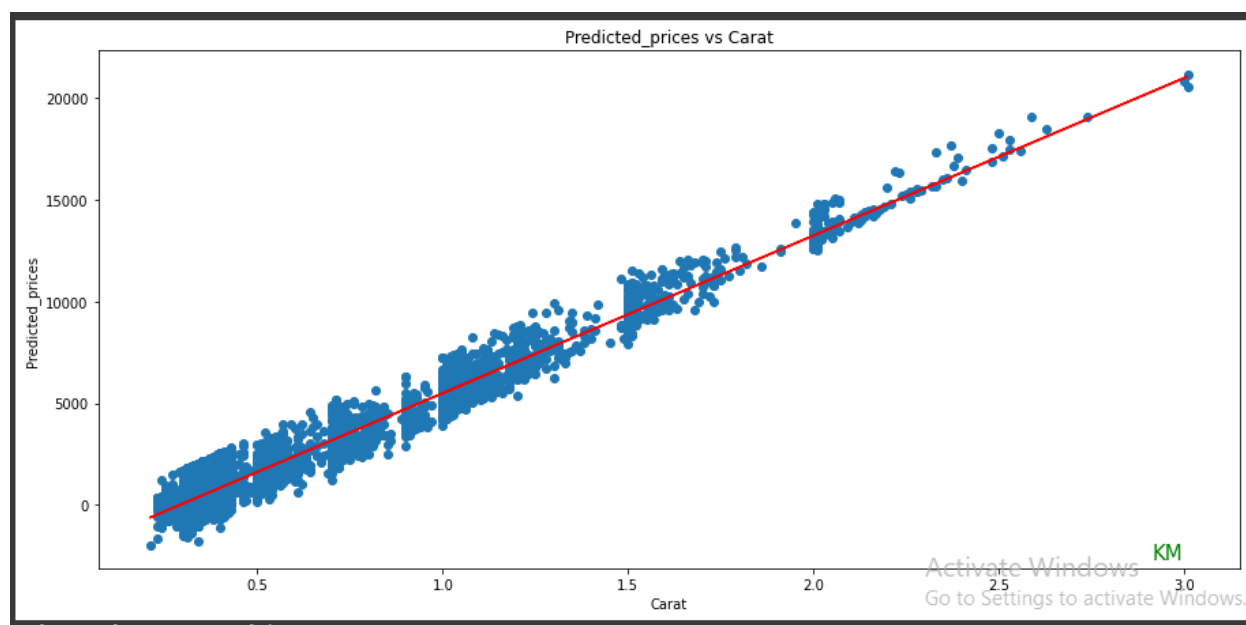
Make sure to plot and include the visualizations in this report. For example, you can create graphs in Excel and copy and paste the graphs into this Word document.

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.



Andy: Great work including all the relevant labels in both charts! This helps with the chart interpretability and improves the overall quality of our report.

3. What strikes you about this comparison? After seeing this plot, do you feel confident in the model's ability to predict prices?

- What strikes me is that the model can predict negative values when the carat is less than 0.5 hence more factors should be considered when predicting the diamond 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.

Do the sum of the predicted prices then apply 70% on the totals. The recommended price is **\$8211163.1**

Andy: The idea here is to see that the expected prices are in a much narrower range than the actual set of prices.

With this, we see that there are other factors that are not included that can help improve the accuracy of the model.

We can see that although the model can do a good job on average, for any particular diamond the forecast may be very wrong, including negative predictions. I would not be confident in using this to set prices for each diamond, although it would seem that it would still be a bit useful to set a bid price.

Andy: Strictly speaking the expected offer would be \$8,213,465.

We arrive at this number by predicting the price of each diamond with the formula provided.

After adding all the predictions together to arrive at the sum of the predictive price of the diamond set and multiply that number by 70% to consider the discount provided by the distributor.

Nevertheless the most important point here is that our model is not precise to the point where we are confident in the decimal values predicted. The takeaways is that our offer should be in the neighborhood of ~\$8MM