

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?

$$\text{Price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$$

The increase in carat leads to an increase in the price and this increase varies according to the size of the carat. From the model given, the carat is \$8,413; the more we increase one carat, the price will increase \$8,413 plus if the weight of carat 2 would be \$16826, if it weighs 3 would be \$25,239 and so on.

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?

$$\text{Price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$$

Now we will compensate the equivalent for the value of the carat, cut and clarity that given in the question:

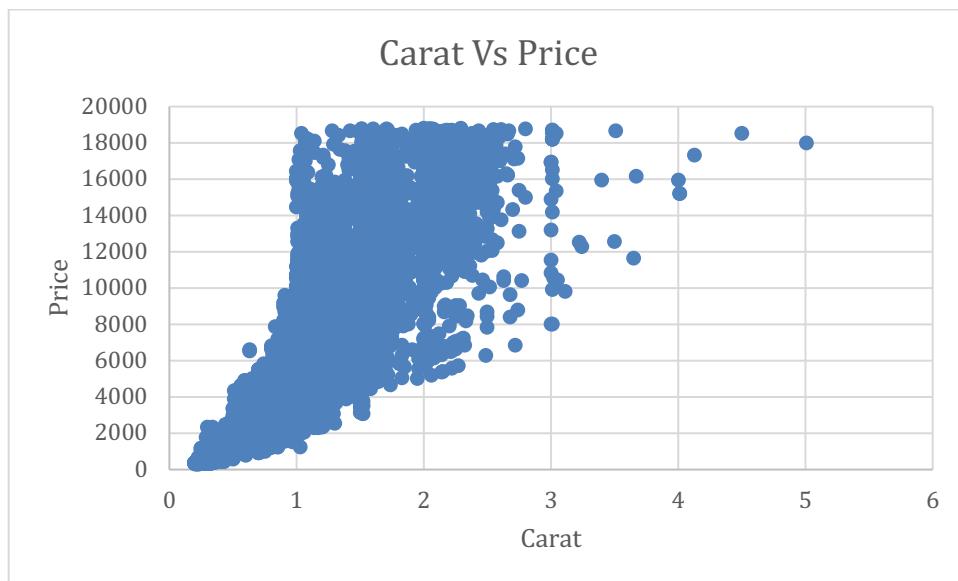
$$\begin{aligned}\text{Price} &= -5,269 + 8,413 \times 1.5 + 158.1 \times 3 + 454 \times 5 \\ &= -5,269 + 12,619.5 + 474.3 + 2,270 \\ &= 10,094.8\end{aligned}$$

So, the price for 1.5 carat is **\$10,094.8**

Step 2: Visualize the Data

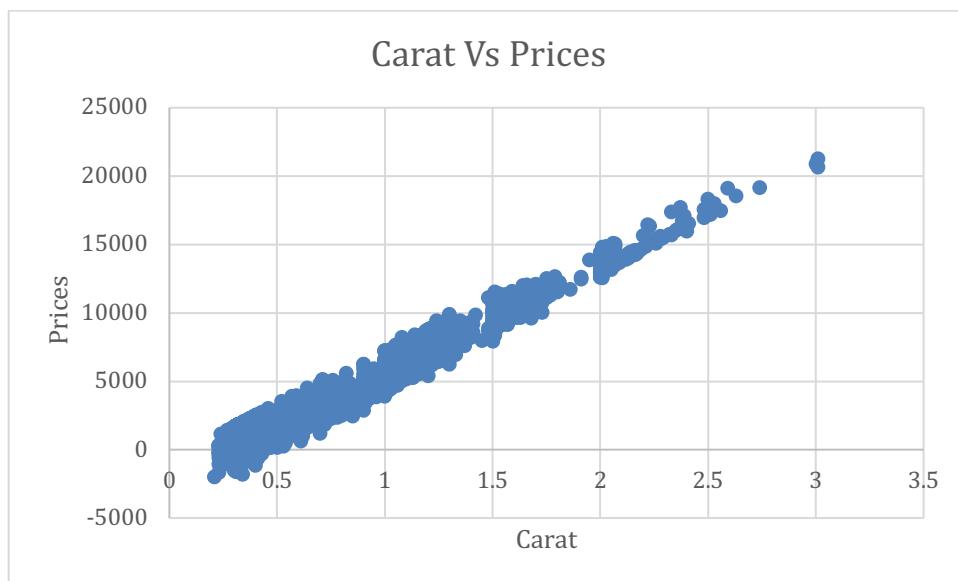
Make sure to plot and include the visualizations in this report. For example, you can create graphs in Excel and copy and paste the graphs into this Word document.

1. Plot 1 - Plot the data for the diamonds in the database, with carat on the x-axis and price on the y-axis.

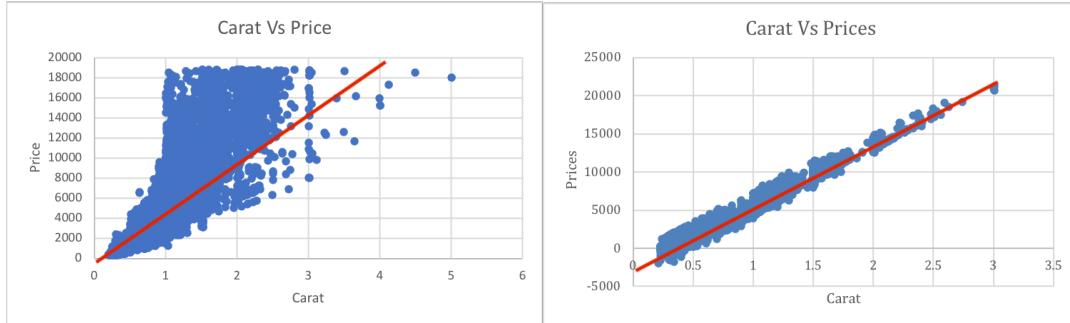


2. Plot 2 - Plot the data for the diamonds for which you are predicting prices with carat on the x-axis and predicted price on the y-axis.

- 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?



We note from the previous pictures that the relationship between carat and price is the more carat, the higher the price, and after the calculation of the correlation, output is 0.9. This means that the correlation between price and the carat is strong. But it became clear that some prices were negative, which is not logical, because the company will make a purchase offer

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 suggest that the jewellery company make a purchase offer in the amount of **\$8213465.93**. It came to this proposal after i was predicted and sum all the forecasted, which were totaled **(\$11733522.76)** and then took 70% of the total prices as given in the project details.