

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?

If a diamond is 1 carat heavier than another with the same cut, according to the model, we expect to pay \$ 8,413 more. Based on the equation from the linear regression model used to predict the diamond prices, with every increase in carat the price we pay increases with \$ 8,413.

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?

Linear regression model equation is:

$$\text{price} = -5,269 + 8,413 * \text{carat} + 158.1 * \text{cut} + 454 * \text{clarity}$$

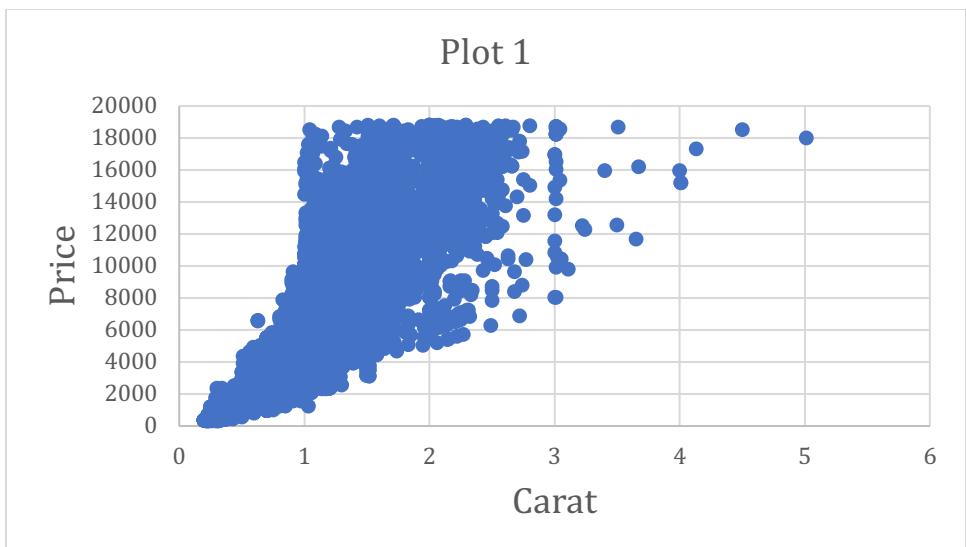
$$\text{price} = -5,269 + 8,413 * 1.5 + 158.1 * 3 + 454 * 5$$

$$\text{price} = 10,094.8$$

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?

The comparison that this plot gives us shows that there is definitely an increase in prices based on increase in carat, but also there are other characteristics of the diamond that make a 2 carat diamond cost more or less. This is why I do not feel confident about this model. Also, the negative values in predicted prices show that this model somehow misses some aspects. It just has no sense to me of having negative values.

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 would recommend the jewelry company to bid \$8,213,465.93. I arrived at this price based on the fact that the company purchases diamonds from distributors at 70% of the retail price. With that said, the predicted price that we got from our model is the retail price. I have added all the predicted prices to make a SUM of the retail price for the 3000 set of diamonds. The result I got is 11,733,522.8. Then, 70% of the retail price ends up being \$8,213,465.93.