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?

   The formula for determining the diamond price is:
   Price = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity**

   Therefore, for the same cut and clarity, we expect to pay an additional 8,413 if the diamond is 1 carat heavier.

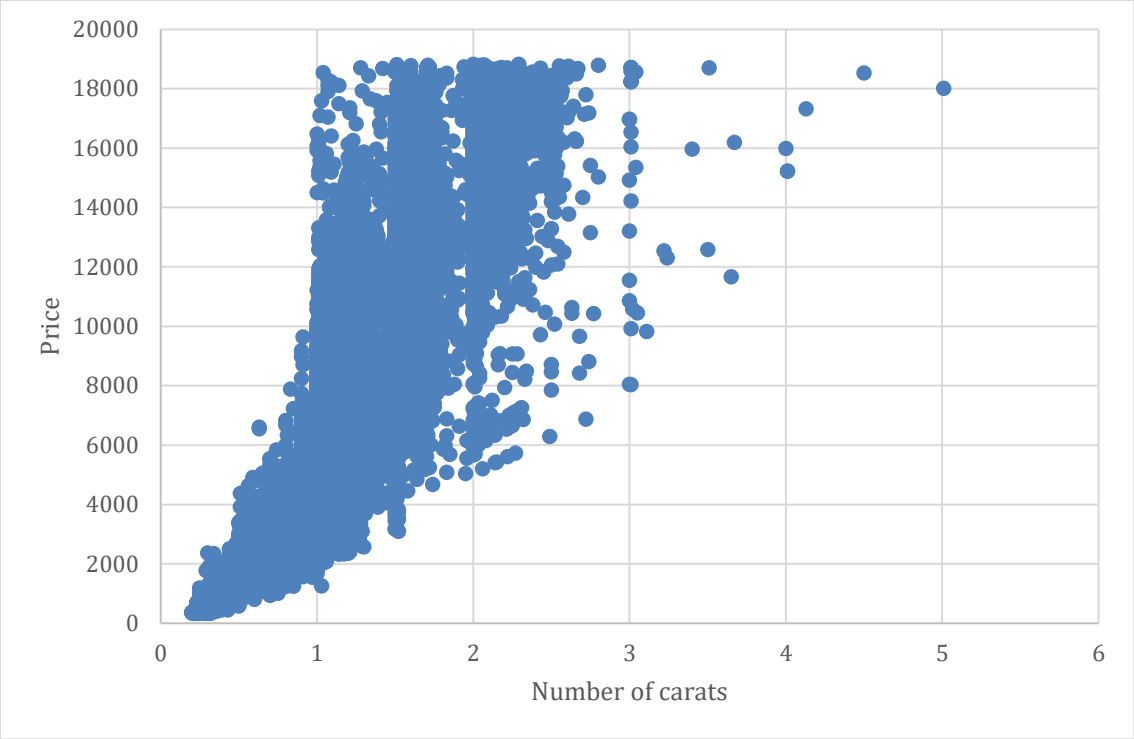
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?

   Price = -5,269 + 8,413 x **1.5** + 158.1 x **3** + 454 x **5** = 10,094.8

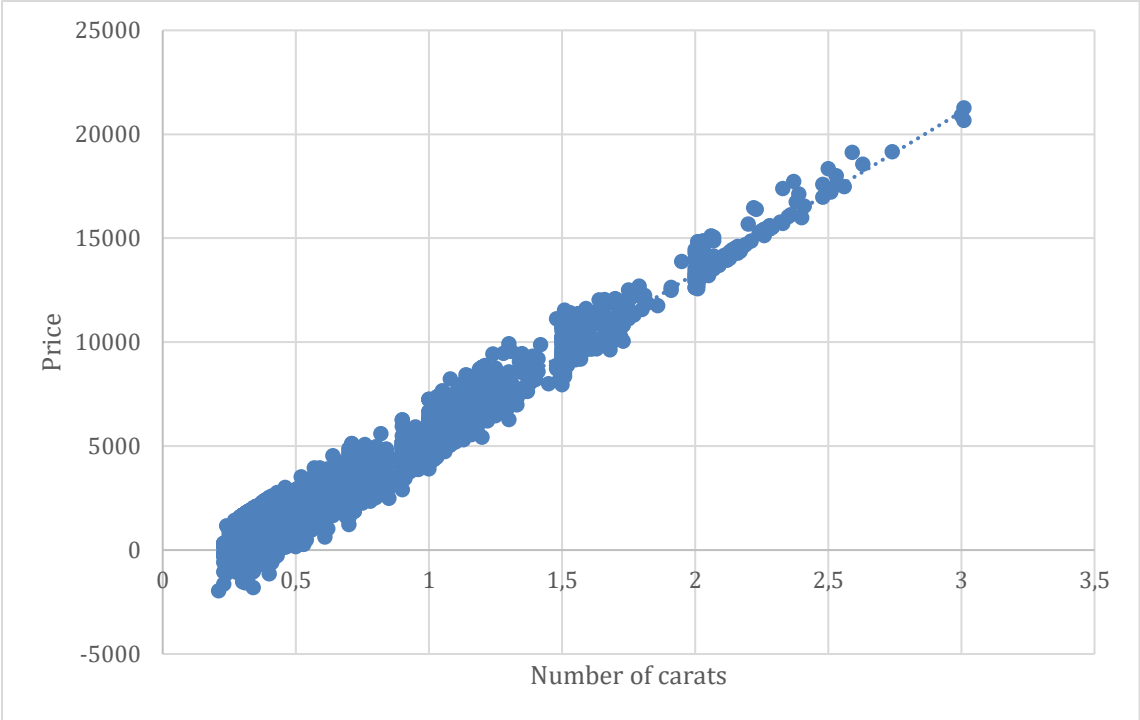
Step 2: Visualize the Data

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.

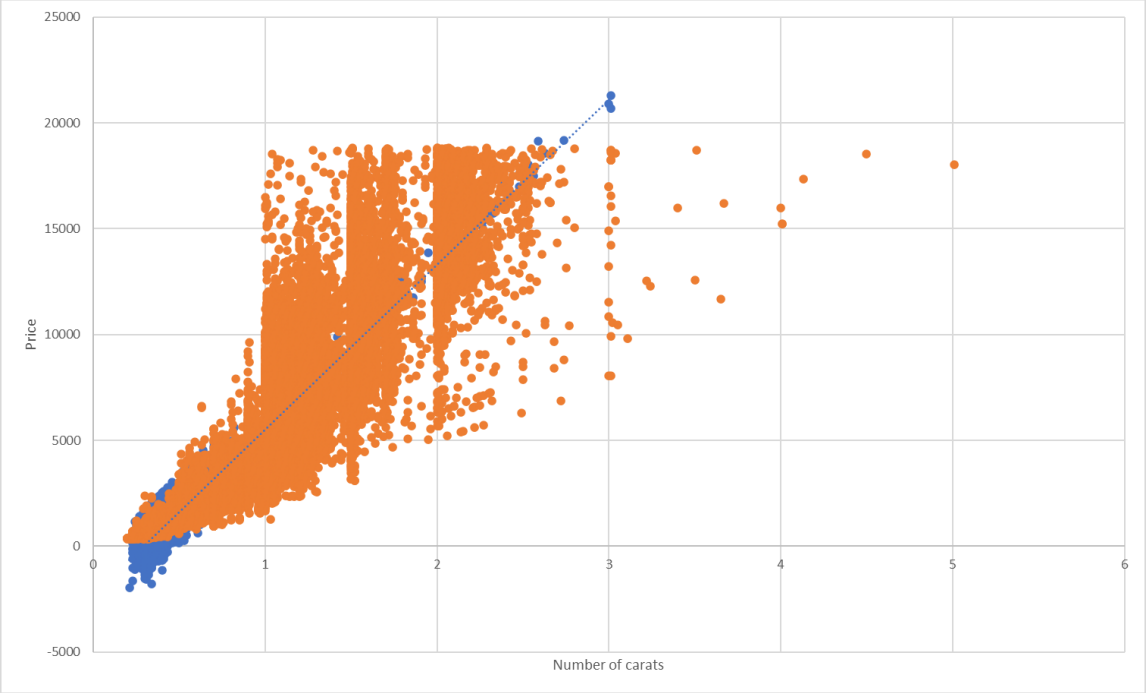
1. Plot 1 - Plot the data for the diamonds in the database, with carat on the x-axis and price on the y-axis.



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?

The trendline reflects the correct given formula with which we can calculate the average price for a diamond based on carats, cut and clarity.

However, the target price for most of the diamonds which have less than 0.4 carats (+ low clarity and cuts quality), cannot be less than 0 (in reality) – as it is the case with 291 diamonds.

I am confident in the model's ability to predict prices from a certain point up. For the lowest quality of diamonds, another formula must be followed.

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.

Based on the predictive formula, the company can bid the sum of 8,213,465.93 (70% of 11,733,522.8).

However, the 291 diamonds which have a value lower than 0, account for the total sum of -136,859.7.

If we consider the 291 diamonds having the value of 0, we can expect the final sum to be higher:

70% * (11,733,522.8 + 136,859.7) = 70% * 11,870,382.5 = **8,309,267.72**.
This is the minimum the company can bid.