Project: Diamond Prices

Step 1: Understanding the Model

Answer the following questions:

1. According to the linear model provided, if a diamond is 1 carat heavier than another with the same cut and clarity, how much more should we expect to pay? Why?

   *We are expected to pay **8,413 more dollars**, because of this diamond's one additional carat. Let's suppose that the first diamond's price is (-5,269 + 8,413 x 1 + 158.1 x 1 + 454 x 1 =) **$3756**.1 and the second diamond's price is (-5,269 + 8,413 x 2 + 158.1 x 1 + 454 x 1 =) **$12,169.1***

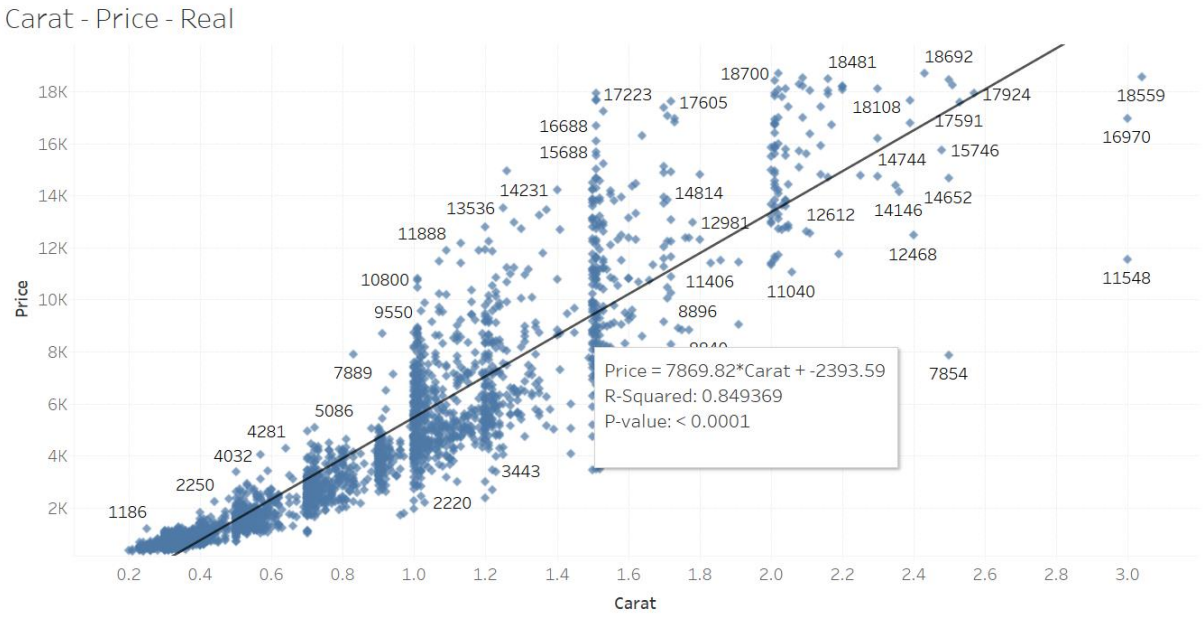
2. If you were interested in a 1.5 carat diamond with a **Very Good** cut (represented by a 3 in the model) and a **VS2** clarity rating (represented by a 5 in the model), how much would the model predict you should pay for it?

   *If we add these values to the model, expected price will be (-5,269 + 8,413 x 1.5 + 158.1 x 3 + 454 x 5 =) **$10,094.8***

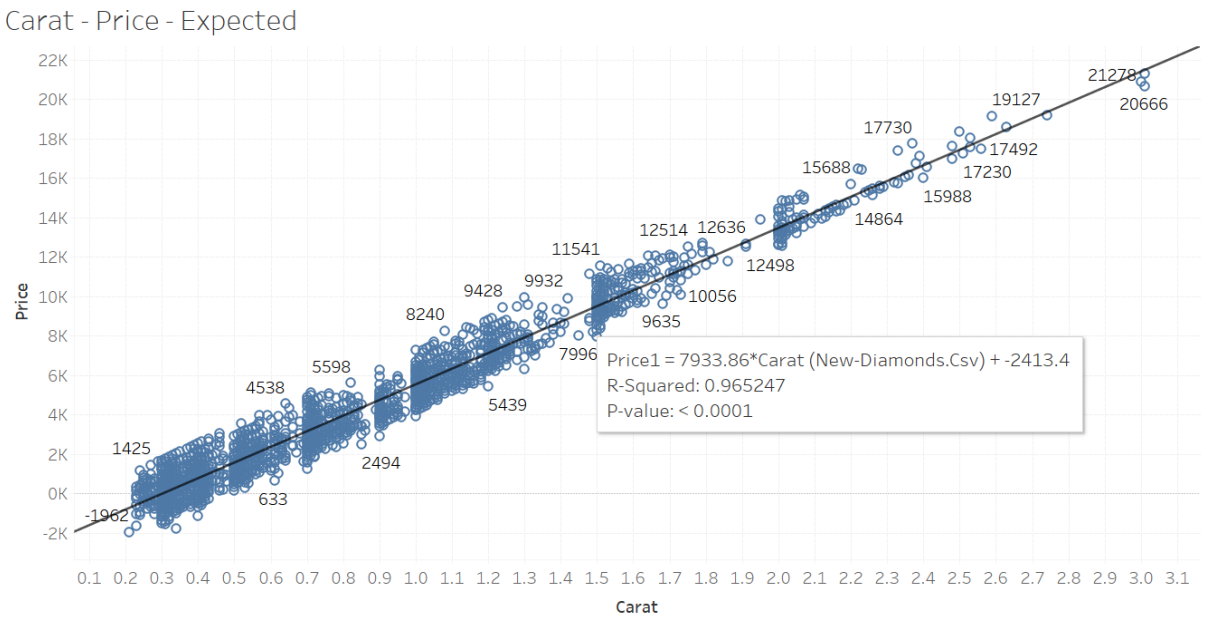
Step 2: Visualize the Data

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 relationship between price and carat is questionable, because the predicted price can fall below 0, which is not possible.*
   - *In the real price graph, there's higher deviation from the trend line, in relation to the predicted price graph.*
   - *R^2 for the predicted prices is high enough to say it's a reliable prediction model, but the fact that there are many observations is what makes the R^2 high.*

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. HINT: The number should be 7 digits.

   *The amount can be calculated if all the predicted prices are summed up and then subtract the 30%. The calculated prices are the ones the customers of the diamond company will pay and the company wishes to have 30% profits. The amount that will be paid for the purchase of the new diamonds is (SUM (new-diamonds_prices) * 0.7 =)* ***$8213465.932***