Step 1 - Understanding the Model:

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 would the retail price of the heavier diamond be? Why?

    - If a diamond with 1 carat heavier than with same cut and clarity, the retail price would be **8413 more**.

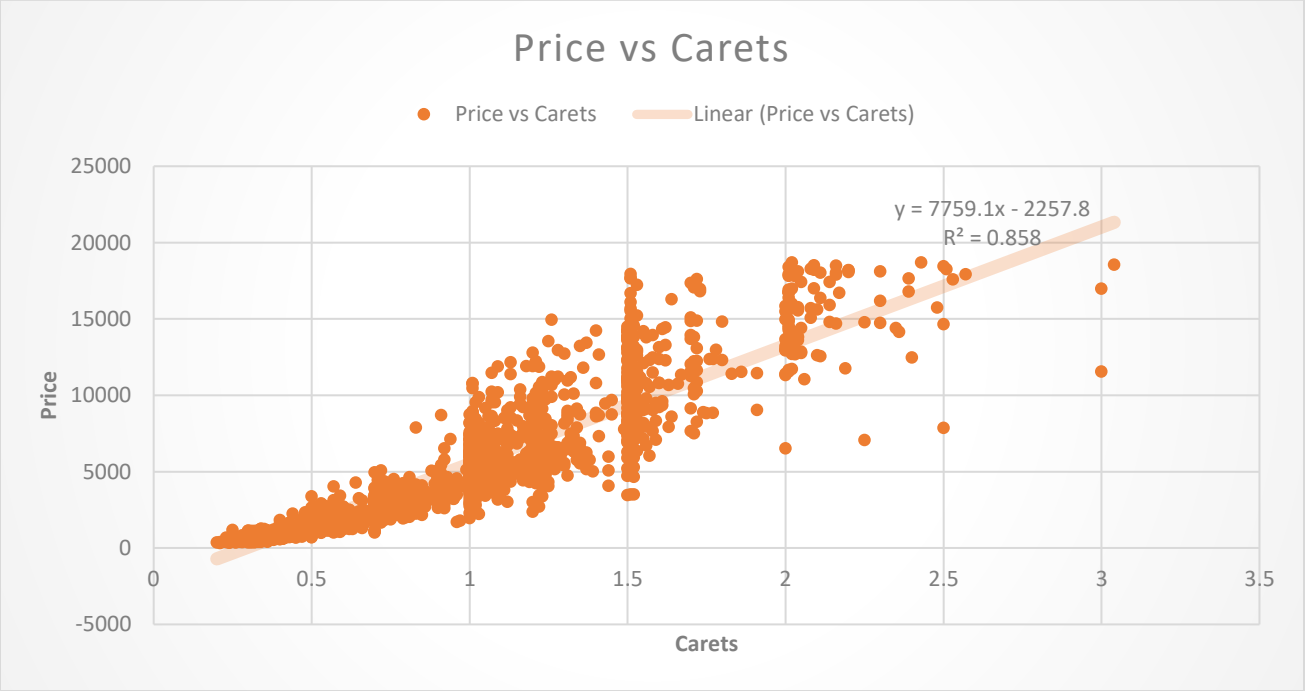
2. If you were interested in a 1.5 carat diamond with a *Very Good* cut (represented by a 3 in the model) and a *VS2* clarity rating (represented by a 5 in the model), what retail price would the model predict for the diamond?

    - One easy way to find the retail price that model predicted would be to substitute these values in the equation.

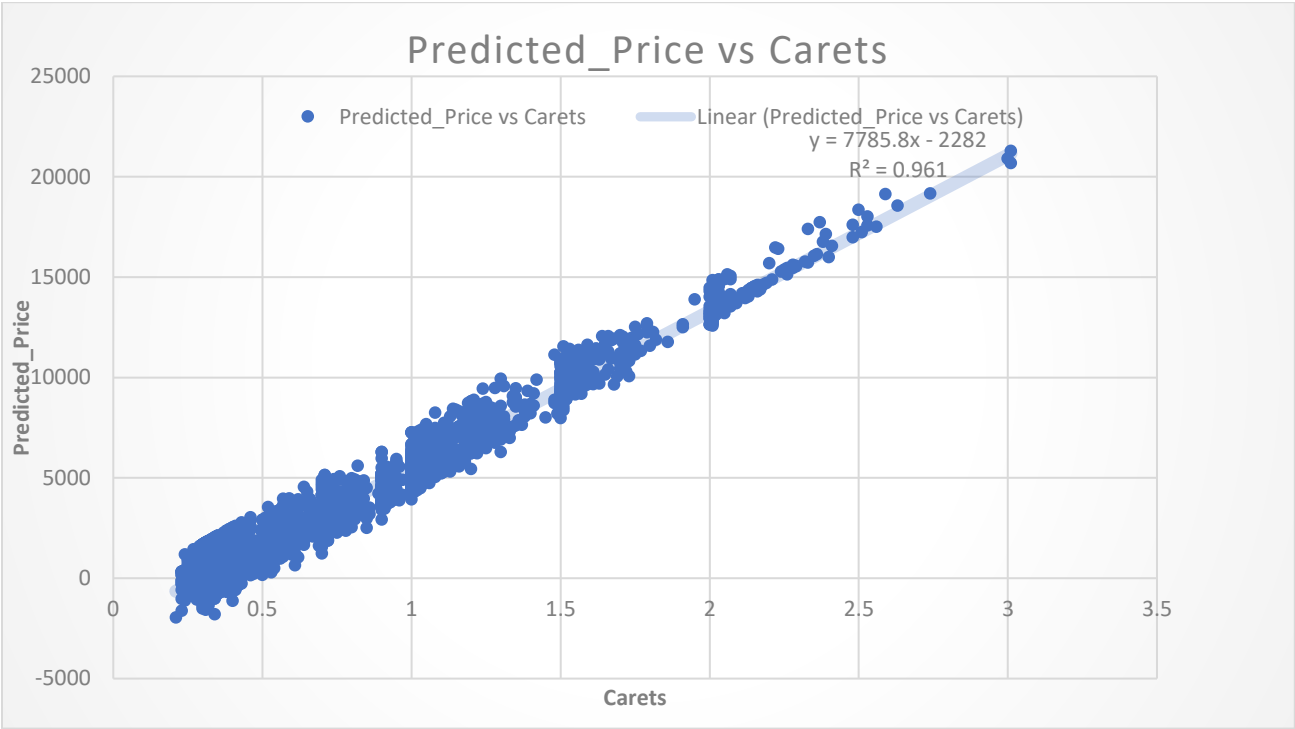
    - Price = - 5269 + 8413 x Carat + 158.1 x Cut + 454 x Clarity
      = - 5269 + 8413 x (1.5) + 158.1 x (3) + 454 x (5)
      Price = 10094.8

Step 2 - Visualize the Data: Create two scatter plots. If you're not sure what a scatter plot is, see here.

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



- 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.

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

    - This linear regression model has the strong correlation between caret and its price which tells us that we have the caret should be considered as one of the features. If we look at some of the predicted data for carets less than 0.5, we can see negative values, so we still need to include more features to this model.

Step 3 - The Recommendation: What bid do you recommend for the jewelry company? Please explain how you arrived at that number.

- I recommend a bid of $8213465.93 and I came to that number based on the historical data provided and applied it the diamonds available for auctions. Given the company purchases diamonds at 70% of that price, so

    $11733522.8*70% = $8213465.93