# 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?

   - A diamond 1 carat heavier than another is **$8,413 more**, with the cut quality and the clarity being the same.

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+8,413x**Carat**+158.1x**Cut**+454x**Clarity**
        =-5269+8413x(1.5)+158.1x(3)+454x(5)
        = $10094.8
     Using linear regression model, it would cost **$10,094.80**.

# 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?

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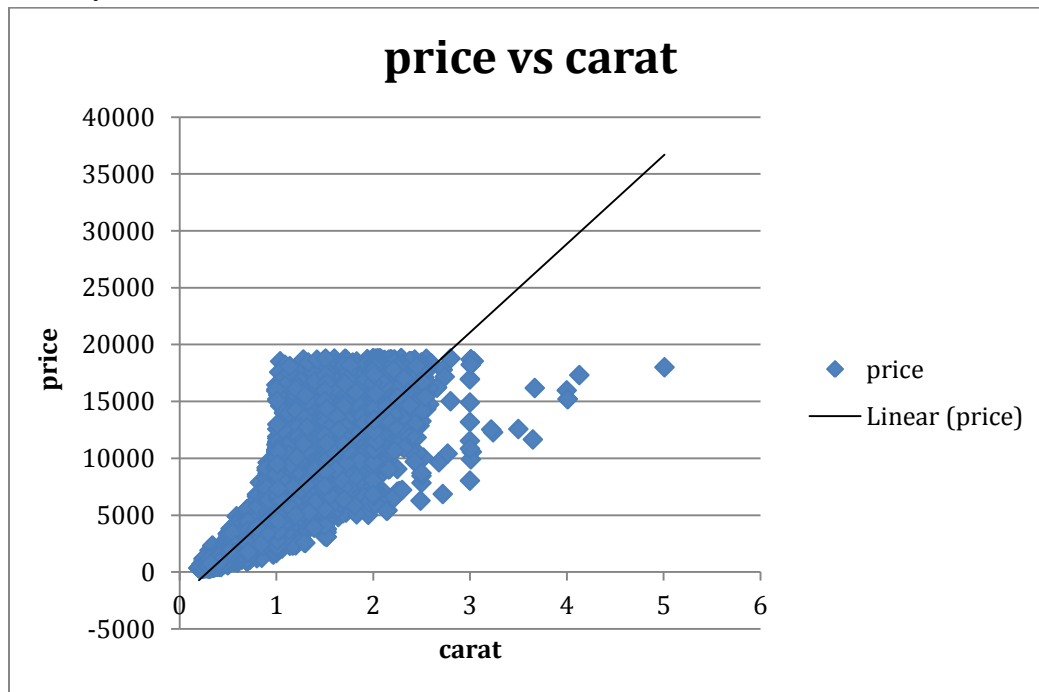


2. Plot 2 - Plot the data for the diamonds for which you are predicting prices with carat on the x-axis and predicted price on the y-axis.
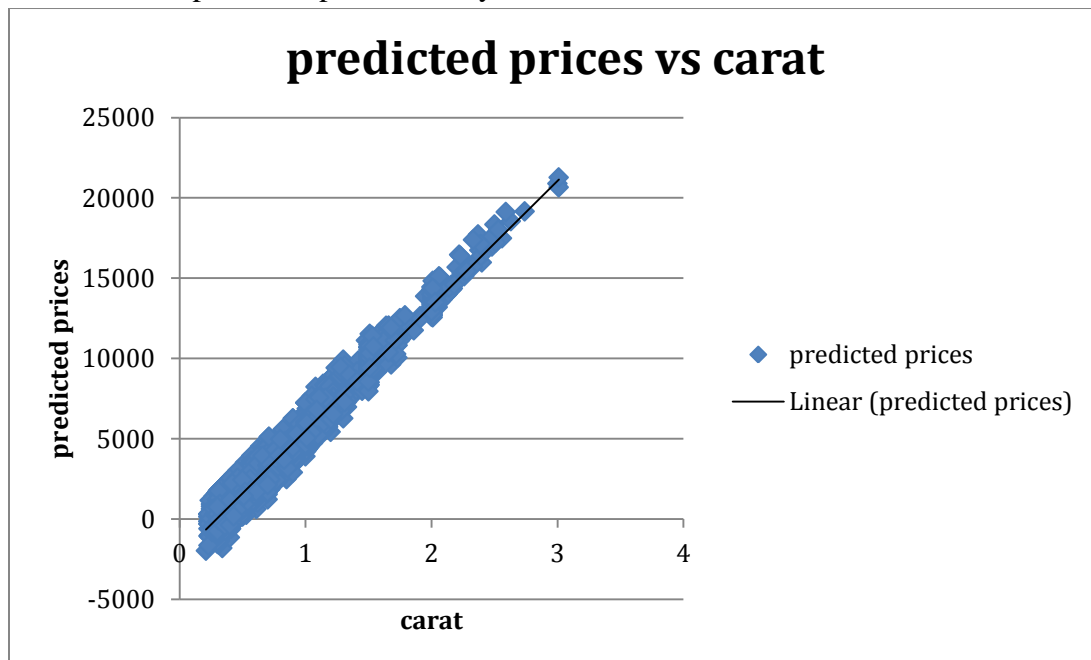
3. What strikes you about this comparison? After seeing this plot, do you feel confident in the model's ability to predict prices?

- The relationship between price and carat are less obvious when the diamond carat is less than 0.5 because the predicted price can often fall below $0 which is not possible.
- The model shows a strong correlation between carat and price when carat is between 0.5 to 2.
- Here, other attributes such as cut and clarity, have a greater impact in prices.

# 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.

   - Each diamond price is predicted using linear regression model.
   - The predicted prices are summed up.
   - Apply a 70% on the summation for all predicted prices for bidding price.

   The bid price is recommended to be **$8,213,466**.