

## Project: Diamond Prices

Complete each section. When you are ready, save your file as a PDF document and submit it here: <https://classroom.udacity.com/nanodegrees/nd008/parts/235a5408-0604-4871-8433-a6d670e37bbf/project#>

### 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 price of the diamond which is heavy by 1 carat will be 8413 more than the diamond which is lighter in weight.

Reason: As per the equation given

$$\text{Price} = -5,269 + 8,413 \times \text{Carat} + 158.1 \times \text{Cut} + 454 \times \text{Clarity}$$

Since everything is same and the carat is 1 more than the lighter one hence the difference in prices is of 8413.

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?

As per the given equation the price of the diamond with above specifications will be:

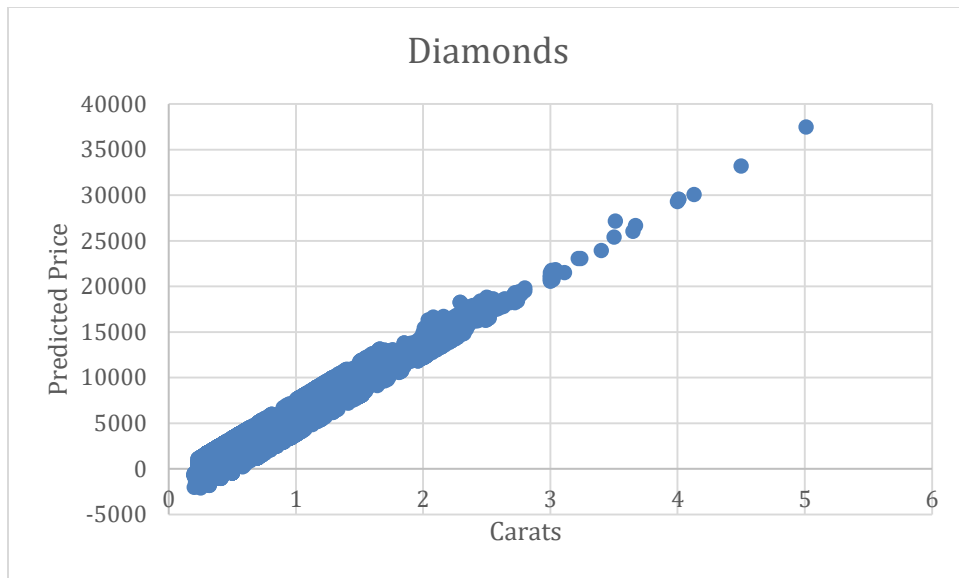
$$\begin{aligned}\text{Price} &= -5269 + 8413 \times 1.5 + 158.1 \times 3 + 454 \times 5 \\ &= 10094.8\end{aligned}$$

Hence, the price of the diamond will be 10094.8

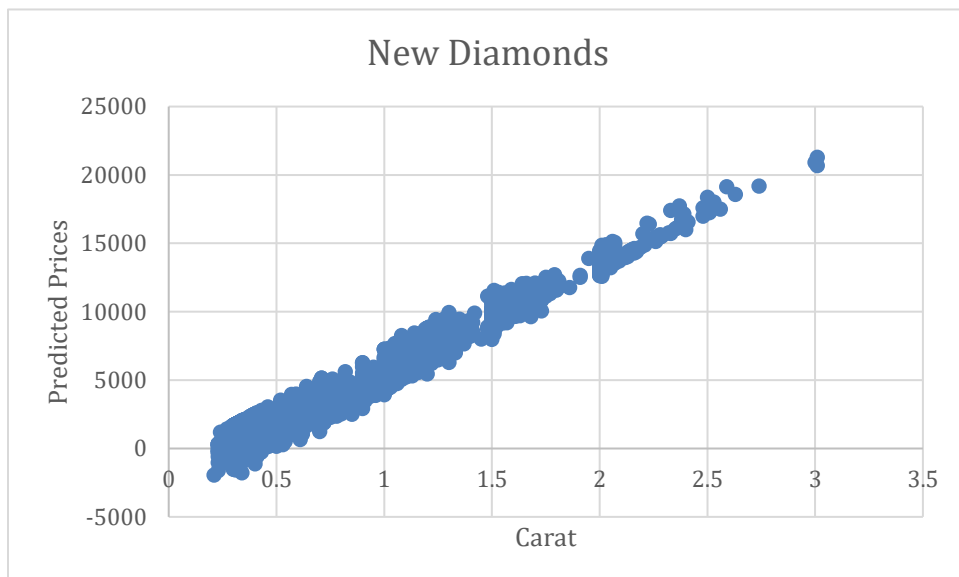
### Step 2: Visualize the Data

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?

With the model (equation) provided by the diamonds it seems there is a linear relationship between the carats and the prices and as the carats in the diamonds are increasing their prices is increasing as well.

Yes, the model seems to predict the price well.

## 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.

The Recommended Bid price for the company is 8213465.932.

We sum up all the predicted price of the new diamonds and then multiply it by 0.7 (as 70% margin was mentioned in the problem statement).

Sum of all the predicted prices 11733522.76 and then calculated its 70% which is our final bid price: 8213465.932