Project: Diamond Prices

# Step 1: Understanding the Model

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?

*Answer:*

*As the equation implies:*

***Price****= -5,269 + 8,413 x****Carat****+ 158.1 x****Cut****+ 454 x****Clarity***

***We take:***

***diamond 1 =*** *-5,269 + 8,413 x (****Carat=1)****= 3144*

*diamond 2 = -5,269 + 8,413 x (****Carat****=2) = 11557*

*Difference = 11557 - 3144 = 8143*

*For each carat increase, there will be* ***8,143 $*** *increase in price.*

1. 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?

*Answer:*

*As the equation implies:*

***Price****= -5,269 + 8,413 x****Carat****+ 158.1 x****Cut****+ 454 x****Clarity***

***You should pay:***

***Price****= -5,269 + 8,413 x 1.5 + 158.1 x****3****+ 454 x****5 =*** *$ 10,094.80 $*

# Step 2: Visualize the Data

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

*Answer:*

* + colors.

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

*Answer:*

1. *There are negative values in the predicted prices, it does not make sense.*
2. *The gap increases when the carat is more than 3. Which means the model confidence is becoming low when the carat is more than 3.*

*Scatter plot without negative values:*

# Step 3: Make a Recommendation

1. What price do you recommend the jewelry company to bid? Please explain how you arrived at that number.

*Answer:*

*First, I calculated the predicted prices using the proposed equation*

*Then, I removed the negative values, I put zeros instead*

*Lastly, I multiplied the predicted price by 0.7 because as mentioned in project description “The company generally purchases diamonds from distributors at 70% of that price”*

*The bid amount is $ 8,309,267.72*