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?

   Ans 1 – According to the equation of the model (**Price** = -5,269 + 8,413 x **Carat** + 158.1 x **Cut** + 454 x **Clarity) , for the same cut and clarity , if a diamond is 1 carat heavier, the price of the diamond will be 8413 units higher for the consumer. This is because for every unit of increase in carat, as per the equation the carat price increases by 8413 units. The company purchases the diamond from the distributor which is at 70% of that price, hence for the company the price paid would increase by 0.7*8413 = 5889.1 units**

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?

   Ans 2 – The equation for predicting the price of a diamond is Price = -5,269 + 8,413 x Carat + 158.1 x Cut + 454 x Clarity. Simply feeding the values in the model we arrive on .

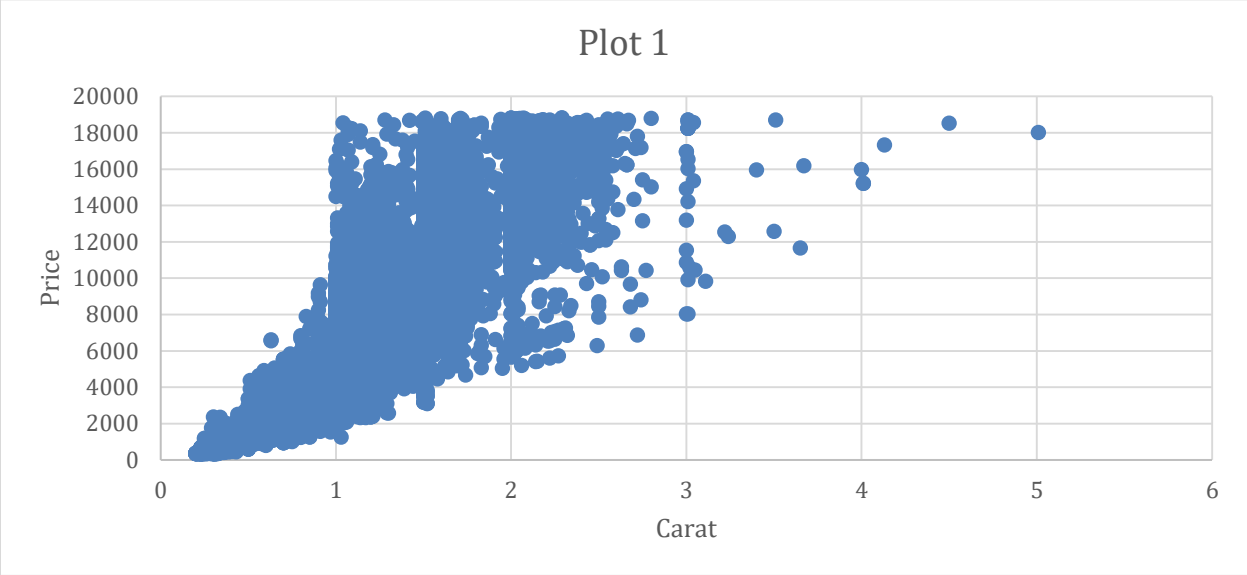
   Price = -5269 + (8413*1.5) + (158.1*3) + (454*5) = 9640.8

   The company pays 70% of this price hence it will pay 0.7*9640.8 = 6748.56

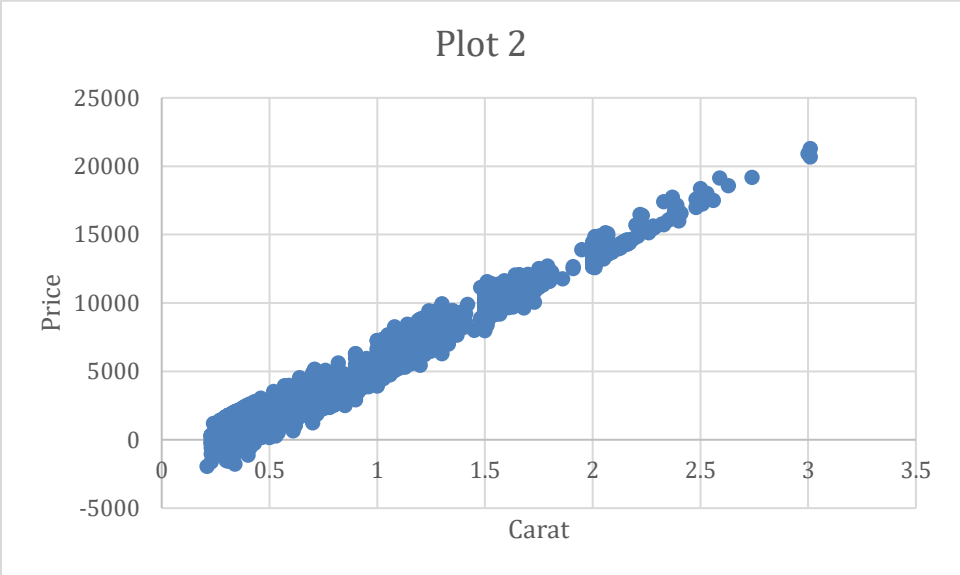
Step 2: Visualize the Data

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.
   ANS 1 -



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.
   Ans 2



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

Ans 3 – The distribution of prices vs carat in the training data/historical data is fairly random whereas the prices as per the predictive model vary fairly constantly with the carats. There are some variations for cut and clarity but this is a fairly linear model.

One anomaly of negative pricing exists. This is because of the equation giving a close estimate but not an accurate one.

I feel confident in the model's ability to predict the prices only in the range in which most of the diamonds fall in terms of carats, cut and clarity.

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.

Ans 1 - We calculated the predicted price for each of the diamond based on its carat, cut and clarity by using the equation - Price = -5,269 + 8,413 x Carat + 158.1 x Cut + 454 x Clarity . Taking the sum of predicted prices of all the diamond, the total market value (for the customer) of all the diamonds is = 11733522.76 . The company will purchase this at 70% of the market price = 8213465. This is the final recommended price.