

# Project Report: Predicting Diamond Prices

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## Project Overview

A jewelry company wants to put in a bid to purchase a large set of diamonds, but is unsure how much it should bid. In this project, you will use the results from a predictive model to make a recommendation on how much the jewelry company should bid for the diamonds.

## Project Details

A diamond distributor has recently decided to exit the market and has put up a set of 3,000 diamonds up for auction. Seeing this as a great opportunity to expand its inventory, a jewelry company has shown interest in making a bid. To decide how much to bid, the company's analytics team used a large database of diamond prices to build a linear regression model to predict the price of a diamond based on its attributes. You, as the business analysts, are tasked to apply that model to make a recommendation for how much the company should bid for the entire set of 3,000 diamonds.

## Step 1: Understanding the Model

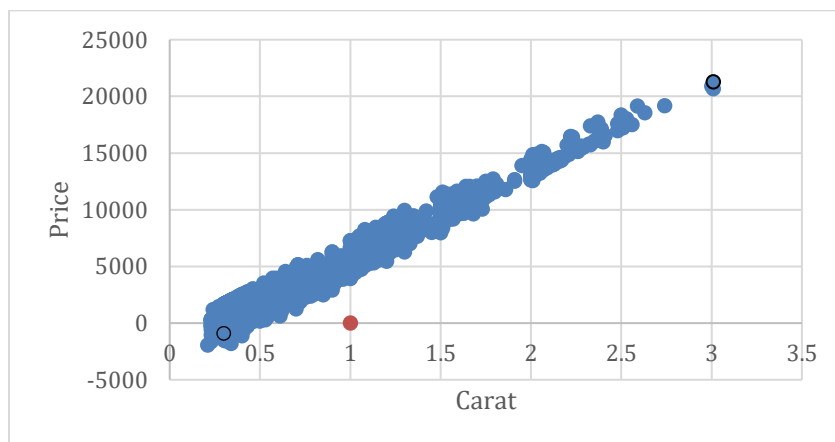
Answer the following questions:

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?
  - One should expect to pay \$8,413 more if a diamond is 1 carat heavier than another with the same cut.
  - The reasoning for the price difference is because of the size. The larger the diamond, the more money is required.
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?
  - \$10,094.80

## Step 2: Visualize the Data

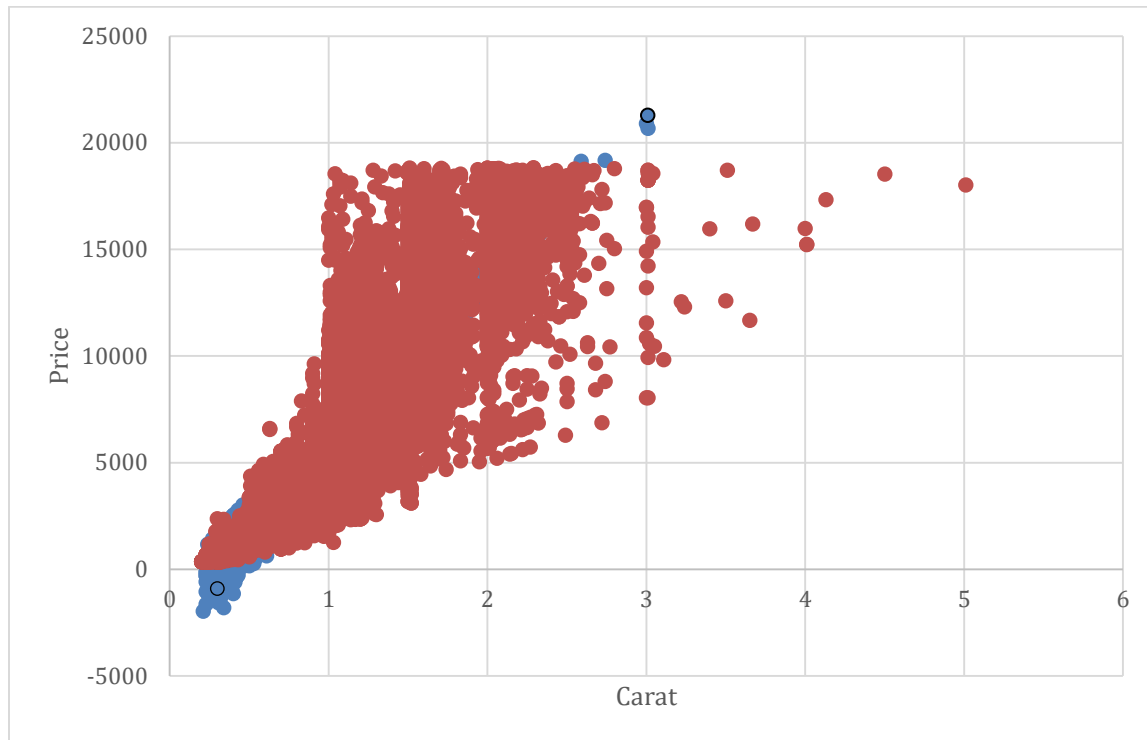
Make sure to plot and include the visualizations in this report. For example, you can create graphs in Excel and copy and paste the graphs into this Word document.

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?
  - The comparison trends closely to the models prediction. Although there are additional factors that will determine the price. Such as the cut, color, and clarity of the diamond.
  - Yes, I feel confident in the models ability to predict diamond 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.
  - The recommended jewelry company to bid for the diamonds is \$8,213,465.93.
  - This number was determined by using the predictive diamond equation model for each diamond. Then taking the sum of all 3,000 diamonds prices (\$11,733,522.76) and calculating 70% of the total sum = \$8,213,465.93