

## Project 1.1: Diamond Prices

### 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.

### 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?

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

If a diamond is 1 carat heavier than another with same cut and clarity we should expect to pay \$8,413

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?

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

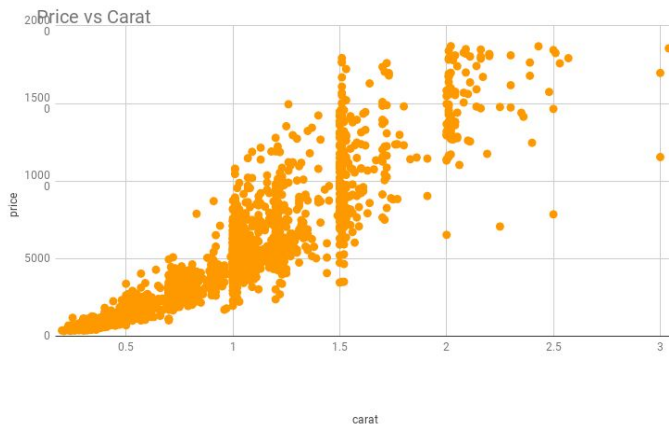
$$= - 5269 + 8413 \times (1.5) + 158.1 \times (3) + 454 \times (5)$$

$$= \$10094.8$$

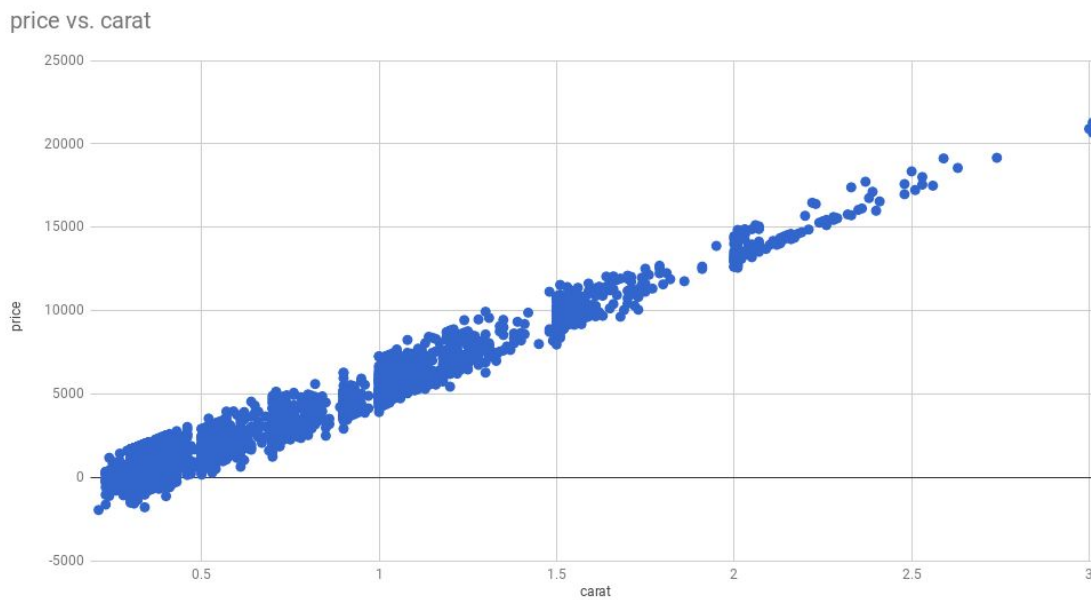
### Step 2: Visualize the Data

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.

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



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



The model only shows a strong correlation between carat and price when carat is between 0.5 to 2. For lower than 0.3 carat, model predicts negative value and steep higher price for carat 3. So, Model is not completely reliable.

## 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.

Price is calculated based on linear regression formula.

Total price predicted for all diamonds is \$ 11,733,522.76

Bid is 70% of Sum (total) = \$ 8,213,465.93