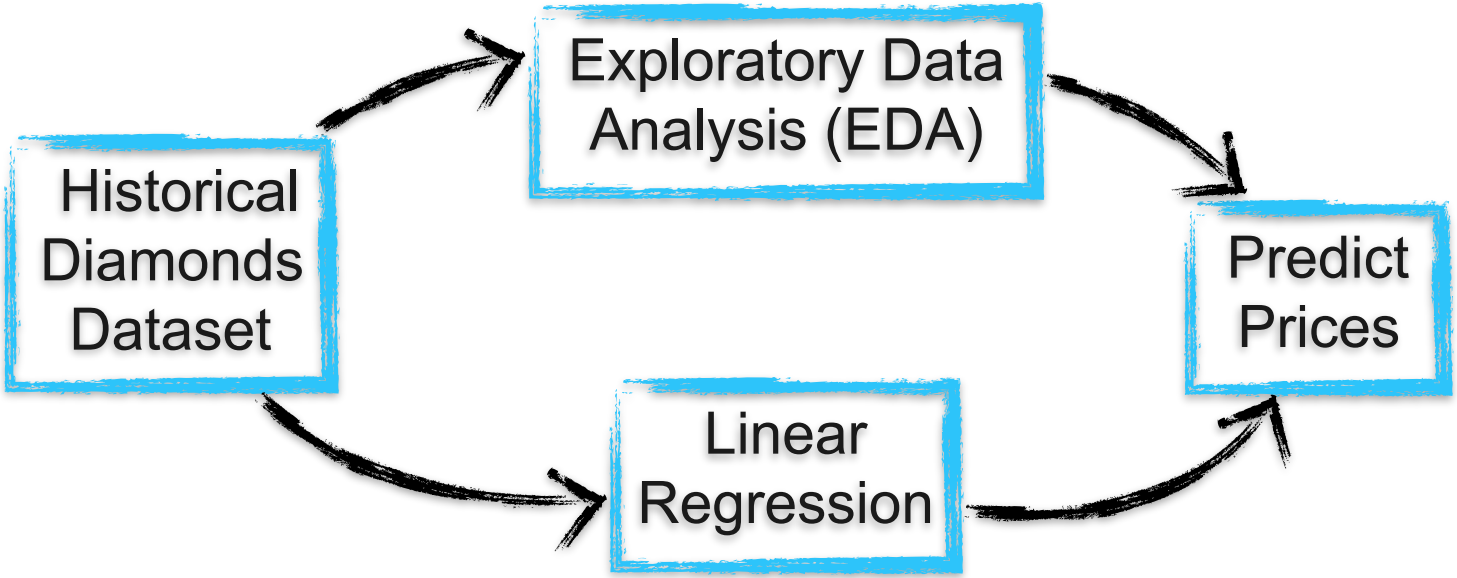
Project 5 - Linear Regression

The world of predictions

Main Objectives

The Linear Regression challenge



Deliverables

- Rick has 5000 diamonds and, in this episode, he's called you to valuate them.
- Your job is to upload a **.csv file** containing the 5000 diamonds and a new column: price_predicted containing the predictions of your linear model.

Deliverables - Example

- Your csv file should be exactly the one you'll be given + the column **price_predicted** containing your predictions of the price of each diamond. Upload it to your GitHub.

	carat	cut	color	clarity	depth	table	x	y	z	price_predicted
0	0.23	Ideal	E	SI2	61.5	55.0	3.95	3.98	2.43	449
1	0.21	Premium	E	SI1	59.8	61.0	3.89	3.84	2.31	393
2	0.23	Good	E	VS1	56.9	65.0	4.05	4.07	2.31	404
3	0.29	Premium	I	VS2	62.4	58.0	4.20	4.23	2.63	418
4	0.31	Good	J	SI2	63.3	58.0	4.34	4.35	2.75	421

When

The deliver will be broken in two parts:

- 11h AM - First deliver
- 09h AM - Final deliver

Metrics

The metric of success is, of course,

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Your goal is exclusively to estimate the price of Rick's 5000 diamonds achieving the smallest amount of error, so they can sell it properly.

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Specifically, we will measure the **root mean squared error** (RMSE) of your predictions, that is:

$$\text{RMSE} = \sqrt{\frac{1}{N}\sum_{i}^{N}(Y_{predicted} - Y_{observed})^2}$$

Remember: ***from sklearn.metrics import mean_squared_error***

Metrics

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Rick's goal is to obtain an **average error not greater than 950 dollars.** Your goal is to create a prediction that will obtain a root mean squared error less than 950 dollars. (If you achieve your goal, double your goal 😜)

Specific Objectives

1. The first deliverable:
    - The idea of the first deliverable is to create a fast and simple baseline model.
2. The final deliverable:
    - The final deliverable should be your best model.
    - All your EDA and Data Cleaning should be focused on enhancing your metric.

Hints

1. There will be a guided path for a structured way to clean and explore your data and create a simple linear model.
2. **Following it is not mandatory**, though. You can have your own ideas and your own insights during data exploration to achieve a good result.

Hints

1. The process of building a prediction is iterative - there is no structured path to follow like **EDA, then Data Cleaning, then Regression Model**. You do all of them together.
2. Use your baseline for comparison. As soon as you make a change (for example, remove outliers), compare your new results against your baseline to see whether it had a good effect or not.
3. Understand your dataset. Look for things that impact the price of diamonds to increase your understanding of the problem and, hence, increase your regression model.

Hints

- Dataset: You should use the dataset you've used for your data gathering project. If you can't, we'll select some for you.
- Storytelling: Don't forget to embed your results in a coherent story. You should **open** your presentation describing your business pain and **close** it with your solution.
- This is a business presentation. Don't forget to bring your data results back to the business reality. Thinks of us as the stakeholder of your project.

Presentation

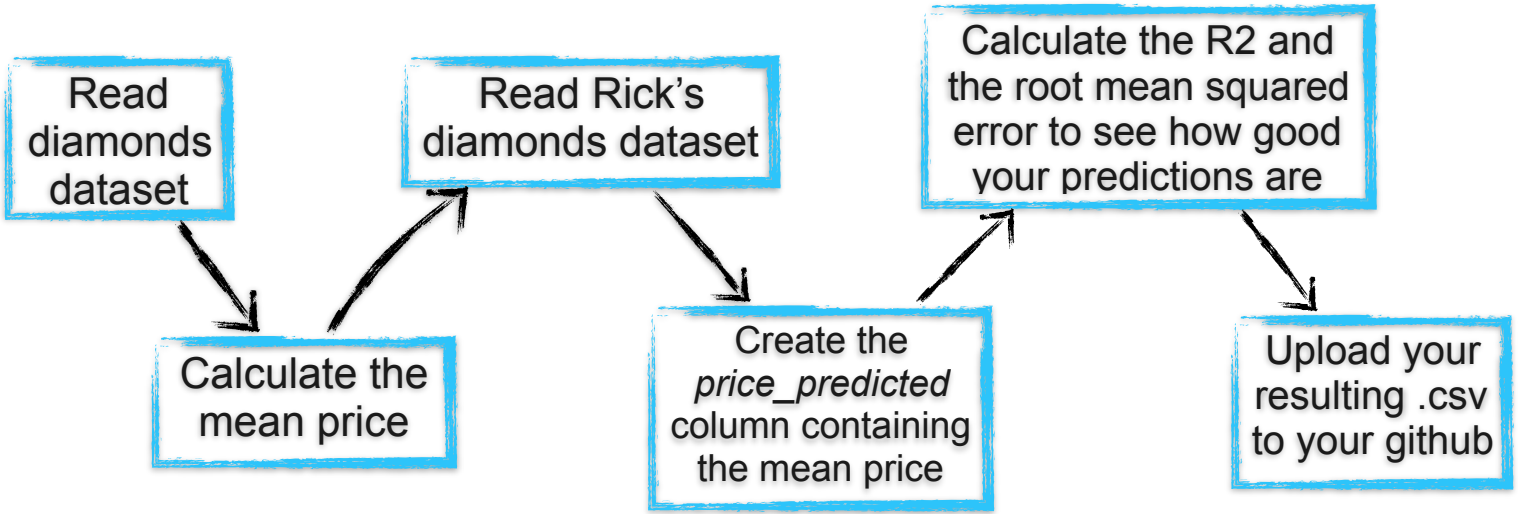
- You'll make a quick presentation showing your results and which insights you've discovered on the analysis of the dataset that has helped you enhance your results.

When

- Tomorrow


IRON
HACK

Hint: Idea on how to create your first baseline - the mean



- You'll predict all observations to be the same value, the mean historical price of diamonds. This will result in a poor model. The idea here is to look for better estimatives to predict price. If your new estimative is worst than this baseline, you should throw it away. As soon as you find a better estimative, this is your new baseline.