

Practical Exam: Used Car Sales

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From	Head of Analytics
Received	Today
Subject:	New task from the marketing team
<p>Hey!</p> <p>I have an analysis task for you from the marketing team. You can see the background and request in the email below. There is the chance for us to have a big impact on the company direction in this project especially with the changes coming to the types of cars we can sell.</p> <p>I would like you to perform the analysis and write a short report for me. I don't need to see any code, but I do want to read your thinking and how you got to your conclusions. I also want you to prepare and deliver the presentation for the marketing team - you are ready for the challenge!</p> <p>You can find more details about what I expect you to do here. And information on the data here.</p> <p>I will be on vacation for the next couple of weeks, but I know you can do this without my support. If you need to make any decisions, include them in your work and I will review them when I am back.</p> <p>Good Luck!</p>	

From:	Marketing Team
To:	Head of Analytics
Received:	Yesterday
Subject:	Marketing strategy

Hi,

Thanks for the previous work you did for us, it was really helpful and the recommendations have really improved our way of working. After that success, I have a new project for your team!

I am sure you have heard that by 2030 we are only going to be able to sell Electric vehicles here in the UK. We want to run some campaigns to promote used Electric cars. We know that in the last year we haven't sold any electric cars, so we want to know about hybrids to give us some ideas. We want to know anything you can tell us about how the sales differ between hybrid and other types from sales over the last six months.

We know that there are less hybrid cars for sale. We think they are more expensive, so we need to make them more appealing. We think hybrid could be a good way to get buyers to think about more environmentally friendly cars.

Our goal is to increase the number of sales of hybrid and electric cars next year.

We want to get moving on this campaign as soon as possible to beat our competitors so the sooner you can share some insights the better.

Look forward to seeing your presentation.

Company Background

Discount Motors is a used car dealership in the UK. They want to lead the way in used cars. Selling to customers who want the latest and greatest features, without the price tag of a brand new car.

The UK Government has now announced that from 2030 all new cars will be required to be zero emissions. Although this won't impact the used car market, it is expected that buyers will give more consideration to the future value of their cars. And petrol and diesel will likely have a much lower value after 2030.

UK Used Car Sales

The details in the data reflect the information given to potential buyers in the website adverts.

Buyers typically want to know the road tax of a used car, which varies based on a combination of year registered, emissions and fuel type, with Electric cars currently exempt from road tax.

Overview



6,200 miles

839 miles above average ⓘ



Petrol



Hatchback



1.6L



Manual



3 doors



5 seats



1 owner ⓘ



ULEZ ⓘ

Description

Black, 1 owner, £34,995 [Read more](#)



Specification



Running costs



Example of a used car advert from [AutoTrader](#)

Dataset

The marketing team has provided some data from the website listings from the last six months. We know that all of the cars in this data sold. I think there is a lot of information missing that could be useful to us.

You can download the data from [here](#). I will let you decide how to process it, just make sure you include all your decisions in your report.

The data hasn't been validated, so make sure that you check it against all of the information in the table before you start your analysis.

Column Name	Details
model	Character, the model of the car, 18 possible values
year	Numeric, year of registration from 1998 to 2020
price	Numeric, listed value of the car in GBP. Assume the car also sold for this.
transmission	Character, one of "Manual", "Automatic", "Semi-Auto" or "Other"

mileage	Numeric, listed mileage of the car at time of sale
fuelType	Character, one of "Petrol", "Hybrid", "Diesel" or "Other"
tax	Numeric, road tax in GBP. Calculated based on CO2 emissions or a fixed price depending on the age of the car.
mpg	Numeric, miles per gallon as reported by manufacturer
engineSize	Numeric, listed engine size, one of 16 possible values

Guide to Analysis Projects

1. I would like you to create a written report to summarize the analysis you have performed and your findings. The report will be read by me (Head of Analysis). The list below describes what I expect to see in your written report.
2. You will need to use Google Colab Workspace to write up your findings and share visualizations.
3. You must use the data provided for the analysis.
4. You will also need to prepare and deliver a presentation. You should prepare around 8-10 slides to present to the sales rep. The list below describes what they expect to see in your presentation.
5. Your presentation should be no longer than 10 minutes.

Written Report

Your written report should include written text summaries and graphics of the following:

- Data validation:
 - Describe validation and cleaning steps for every column in the data
- Exploratory Analysis:
 - Include two different graphics showing single variables only to demonstrate the characteristics of data
 - Include at least one graphic showing two or more variables to represent the relationship between features
 - Describe your findings
- Definition of a metric for the business to monitor
 - How should the business use the metric to monitor the business problem
 - Can you estimate initial value(s) for the metric based on the current data
- Final summary including recommendations that the business should undertake

Presentation

You will be giving an overview presentation to the sales rep who requested the work. The presentation should include:

- An overview of the project and business goals
- A summary of the work you undertook and how this addresses the problem
- Your key findings including the metric to monitor and current estimation
- Your recommendations to the business

Grading

Before submitting your written report or delivering your presentation, remember to check your work against the [grading criteria](#)

Assignment Submission Guidelines

1. Write all your code in a single Jupyter Notebook/Google colab file. You just need to submit the .ipynb file.
2. For Presentation, you need to submit the pptx/pdf file of your presentation and also submit the video recording of your presentation (mp4 file)

Grading Criteria

Competency	Sufficient	Insufficient
DATA VALIDATION		
Assess data quality and perform validation tasks	Has validated all variables against provided criteria and where necessary has performed cleaning tasks to result in analysis-ready data	Has not conducted all the required checks and/or has not cleaned the data. May have removed data rather than performed cleaning tasks
DATA VISUALIZATION		
Create data visualizations to demonstrate the characteristics of data and represent relationships between features	Has created at least one visualization including two or more variables (e.g. scatterplot, filled bar chart, multiple boxplots) Has used visualizations that support the findings being presented	Has used the same visualization throughout Has not included graphics to represent single variables and relationships Has not used visualizations that support the findings being presented
COMMUNICATION		
Presents data concepts to small, diverse audiences	For each analysis step, has explained their findings and/or the reasoning for selecting approaches	Has not provided a summary for each step (data validation, exploratory analysis)

You must pass all criteria to pass this part of the certification.