

**Birzeit University**

**Faculty of Engineering and Technology**

**Department of Computer Systems Engineering**

**MACHINE LEARNING AND DATA SCIENCE**

**ENCS5341**

**EXP #5 Filters**

**Report #2**

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**Section:** 1

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# Abstract

This assignment aims to build a series of regression models using a dataset, evaluate and compare their performance, and apply various techniques to improve model accuracy and prevent overfitting. It focuses on both linear and nonlinear registration model, feature selection methods and regularization techniques will be used also followed by hyperparameter tuning, to select the optimal model.

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# Data set description

The dataset refers to YallaMotors website [1], it includes around 6,750 rows and 9 columns, contains 9 features (car name, price, engine\_capacity, cylinder, horse\_power, top\_speed,

seats, brand, country). The main objective of this dataset is to predict car prices, making it ideal for developing regression models to understand the relationship between various features, the target variable is car price.

# Data preprocessing

first step we have standardized all currencies to USD for the target variable “Price”, then we cleaned the dataset by handling the missing values, encoding categorial features and standardizing numerical features.

To convert the price to USD we have used Mocki.io [2] to generate Json file contains the exchange price from each currency to USD [3].

For data cleaning we have cleaned each column separated each null values or wrong values that does not makes sense in the column it was replaced by Nan from the numpy library for the following features: seats, top\_speed, horse\_power, cylinder, engine\_capacity.

Then for the price column each row was checked if it has one of the currencies from the Json file [4] and for the wrong and null data, it was replaced with Nan from numpy library then the null values was taken as the test dataset.

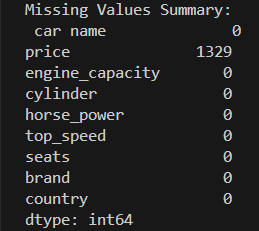
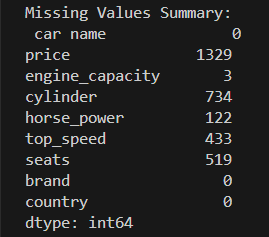
 

Figure :missing values summary before cleaning

Figure :missing values summary after cleaning

# References

[1]: <https://www.kaggle.com/datasets/ahmedwaelnasef/cars-dataset/data>

[2]: <https://mocki.io/>

[3]: <https://mocki.io/v1/6b55e2fc-4bfd-4e13-9589-30636717e6ce>

[4]: <https://mocki.io/v1/24326926-978b-4c04-a7f8-d79022e96d6f>