

## Lab Assignments of Machine Learning

---

All the datasets are available in the following Link:

<https://drive.google.com/drive/folders/15i6Zy9o3VwQZD823ZdJdmMuM6e4IcUUM?usp=sharing>

---

1. Perform linear regression to predict

a. CO<sub>2</sub> Emission

**Dataset: fuel\_consumption\_dataset.csv**

b. The selling price of a used car.

**Dataset: used\_cars\_dataset.csv**

Evaluate the quality of the models by computing relevant performance metrics, including the R<sup>2</sup> value. Generate and display a plot that compares the actual values to the predicted values (Actual vs Predicted) for both tasks.

2. Perform linear regression with L1 (Lasso) and L2 (Ridge) regularization to predict the price of a House. Use hyper-parameter tuning for the best result. Evaluate the accuracy of the models by computing relevant performance metrics, including the R<sup>2</sup> value. Generate and display a plot that compares the actual values to the predicted values (Actual vs Predicted) for both tasks.

**Dataset: housing\_price\_dataset.csv**

3. Perform linear regression with one feature using gradient descent (without using library function) to predict the salary of an employee based on the feature YearsExperience. Use hyper-parameter tuning for the best result. Plot the hypothesis function and the data points after each epoch. Evaluate the accuracy of the models by computing relevant performance metrics, including the R<sup>2</sup> value. **Dataset: salary\_dataset.csv**

4. Perform a non-linear regression to predict China's GDP from 1960 to 2014 from given features. Evaluate the quality of the model by computing relevant performance metrics, including the R<sup>2</sup> value. Generate and display a plot that compares the actual values to the predicted values (Actual vs Predicted) for both tasks. **Dataset: china\_gdp.csv**

5. Perform logistic regression to classify if a patient has a benign tumor or malignant tumor (cancer) based on the features provided. Generate the confusion matrix and evaluate the quality of the model by computing relevant performance metrics including Precision, Recall, accuracy, F1-Score etc. Plot the ROC curve and calculate AUC.

**Dataset: samples\_cancer.csv**