Lab 10 *(due: Apr 17)*
Machine Learning - COSC 4360

Department of Computer Science and Electrical Engineering

Spring 2025

Exercises

*Create a **New Project** for every exercise. Take a screenshot of the source code along with its output and place the **source code** and the **screenshot** in a **zipped folder** named **LastNameFirstName_Lab10***

Exercise 1

Given the following dataset: *from sklearn.datasets import load_diabetes* that contains 442 data points and 10 features, build a **Deep Neural Network** using the **MLPRegressor**. Try different **architectures** with different **hyperparameters**. Implement at least *three* different **architectures**.

Note 1: For a description of the dataset use:

```
print(f'Description:  {diabetes.DESCR}')
```

OR refer to:

characteristics of sklearn Diabetes dataset

Note 2: Use: `diabetes = load_diabetes()` and `X, y = diabetes.data, diabetes.target`

Note 3: Use: `test_size=0.2, random_state=42`

Note 4: To evaluate your model use:

```
from sklearn.metrics import mean_squared_error, r2_score
mse = mean_squared_error(y_test, y_pred)
r2 = r2_score(y_test, y_pred)
```

Exercise 2

Given the following dataset: seeds dataset, build a **Deep Neural Network** using the **MLP-Classifier**. Try different **architectures** with different **hyperparameters**. Implement at least *three* different **architectures**.

Note: At first **scale** your data and then use: `test_size=0.2, random_state=42`

Note: Submit through **Canvas**