Université Abdelmalek Essaadi
Faculté ses Sciences et techniques de Tanger
Département Génie Informatique
Master : MBD
Deep Learning
Pr . ELAACHAk LOTFI

Lab 1

Objective : The main purpose behind this lab is to get familiar with Pytorch library to do Classification and Regression tasks by establishing DNN/MLP architectures.

Work to do:

Part one regression:

Given below the dataset: https://www.kaggle.com/datasets/dgawlik/nyse

1. Apply the Exploratory data analysis technics to understand and visualize the given Dataset.

2. Establish a Deep Neural network Architecture by using PyTorch library to handle the regression task.

3. By using GridSearch tool from sklearn library chose the best hyper-parameters (learning rate , optimizers, epoch, model architecture, etc) that will give an efficient model.

4. Visualize the two graph (Loss / Epochs) and (Accuracy / Epochs) for both training and test data, give your interpretation.

5. Apply several regularization techniques on your architecture then compare the obtained result with the first model.

Part two multi class classification:

Given the below dataset: https://www.kaggle.com/datasets/shivamb/machine-predictive-maintenance-classification

1. Apply the per-processing technics and the given dataset to clean, standardization/normalization of the data.

2. Apply the Exploratory data analysis technics to understand and visualize the given Dataset.

3. Apply data augmentation technics to balance the given Dataset.

4. Establish a Deep Neural network Architecture by using PyTorch library to handle the multi class classification task.

5. By using GridSearch tool from sklearn library chose the best hyper-parameters (learning rate , optimizers, epoch, model architecture, etc) that will give an efficient model.

6. Visualize the two graph (Loss / Epochs) and (Accuracy / Epochs) for both training and test data, give your interpretation.

7. Calculate metrics like accuracy, sensitivity, f1 score, etc, on both training and test dataset.

8. Apply several regularization techniques on your architecture then compare the obtained result with the first model.

Notes :

- **At the end each student must give a brief synthesis about what he has learn during the proposed lab.**
- **Push the work in the Github repository and write a brief report in Github readme file.**

Tools:

Google colab or Kaggle, gitlab/github.