



General Instructions

- The assignments should be completed either using Jupyter Notebooks or pure python (if you use Jupyter, you can include the report in the notebook)
- Provide clear instructions on how to run your code (on the report)
- Keep in mind that we will test your models with data that you do not have access to.
- Both datasets are provided in the following [google drive folder](#).
- Create 2 folders in your GITLAB repo for each assignment. Please name them Water_Consumption and COVID_Classification.
- You will have 1 week to complete these assignments; from the day you receive the second interview stage email.

Assignment 1 Time series forecasting

Objective: The goal of this assignment is to develop a reliable model for forecasting the daily water consumption in a city for the next two years. The model should be based on advanced deep learning or machine learning techniques and utilize a time-series dataset containing hourly water usage data from 2002 to 2016. The final predictions should therefore be for the years 2017-2018.

Deliverables:

1. Performance Metrics: Calculate and report the Mean Absolute Percentage Error (MAPE), Mean Absolute Error (MAE), and Root Mean Squared Error (RMSE) for your validation dataset. You are free to choose any period for the validation dataset.
2. Data Visualization: Create and provide daily and weekly consumption plots using the given dataset.
3. Validation and Training Plots: Generate plots for accuracy, loss.

4. Detailed Report: Submit a comprehensive report detailing your methodology, process, and results.

Note: You are encouraged to explore and select any suitable model for this task.

Assignment 2 Image Classification

Objective: The objective of this assignment is to develop a binary image classification model for identifying and categorizing COVID-19 images to determine whether a patient has COVID-19 or not. The dataset used in this task consists of chest X-Ray images in JPEG format, which are classified into two categories, COVID-19 and Healthy.

The task has the following steps:

1. Data preparation: Split the dataset into appropriate training and validation sets in any way you consider necessary.
2. Model Architecture: Select an appropriate model architecture for the image recognition task. You are allowed to use transfer learning to leverage the pre-trained models.
3. Model Evaluation: Report your model's training and validation loss, accuracy, and any other relevant evaluation metrics using plots. Include a confusion matrix with your models results.
4. Detailed Report: Submit a comprehensive report of your model's architecture, training, and evaluation process, and its results. Explain the reasoning behind your choices and any challenges you faced during the development process.

Note: The accuracy of the model is not the primary focus of this assignment. We are more interested in your thought process and approach towards the image recognition task.

Good Luck!