**Assignment Directions**

This assignment aims to train the students in the activities involved in the definition and generation of features to be consume to an anomaly detection system. Also, the students will train how to generate an anomalous detection system using the ARIMA and Artificial Neural Network approach.

To realize the assignment, the students need to create a group of five participants.

Only one student submits this assignment's answer and any complement files .

**Identification Form**

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| **ID** | **Name** | **E-mail** |
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**PART I – ANALYSIS DATASET**

We will use vibration sensor readings from the NASA Acoustics and Vibration Database as our dataset for this study. In the NASA study, sensor readings were taken on one bearing that were run to failure under constant load over multiple days. Our dataset consists of individual files that are 1-second vibration signal snapshots recorded at 10 minute intervals. Each file contains 20,480 sensor data points per bearing that were obtained by reading the bearing sensors at a sampling rate of 20 kHz.

**Dataset:** Averaged\_BearingTest\_Dataset.csv

**PART II – EVALUATE THE PERFORMANCE OF MODELS**

1. Implement an anomalous detection system, using the ARIMA and the Artificial Neural Network (ANN).
2. Compare the performance (time and cpu consume) during the training and the predictions performed by the two models (ARIMA and ANN)
3. Measure and compare the accuracy (minimum loss error function) performed by the both models.

**Observation 1:** The ANN model that is required to be used is the LSTM.

**Observation 2:** To answer this assigment generate a small report where you cover following topics:

* Enviroment Configuration
* Required Graphs (plots) and the explanations about the results

**Deliveribles:**

* Python code or Jupyter notebooks
* Report (the report can be done in the Jupiter Notebook)