Advanced Predictive Maintenance Engineer – Recruitment assessment

Context of the Hot Finishing Mill (HFM) providing this data

The goal of the HFM machine is to produce coiled strips from semifinished aluminum slabs through the rolling process. HFM rolls the slab into a coiled strip to reduce the thickness, and increase the length while maintaining the width, and profile of the strip. In a day, many slabs are processed through the machine depending on the capacity of the machine. HFM has 4 successive rolling mill stands driven by large motors. The output from the HFM is either sent for further processing within the plant.

Data description

This data is for 100 HFM runs before breakdown. There are two datasets. One dataset has 14 columns, while the other has 10 columns. These two datasets are coming from the same machine but are captured from different sensors.

Column description

hfm_runs: the different runs of the HFM (numbered from 1-100)

no_of_days: days for each hfm_run before this machine broke down

sensor_1 – sensor_20: average for a day for each hfm_run until hfm is failed.

Problem statement

1. Create a model to predict the days left before the failure of the HFM machine.
2. Explain the various approaches, with reasoning, taken to improve the output from the baseline model.

Deliverables

1. Python files: with comments for easy readability
2. pdf: summary of the entire process followed, with assumptions to explain an executive of the company.

Bonus Points

Application for the consumption of the model so that users can send the data to the backend model through this app and gets the output back on this app. The application can be built in Streamlit or FlaskApp, or any other service.

Testing conditions

The duration of this test is around 4-5 hours. During the test, if there are any questions, make suitable assumptions and move forward, explaining the assumptions made in the pdf. Use Python 3.7+ environment for this test with REST API coding style.