Mini Project: Predictive Maintenance using Machine Learning

Project Description

In this mini project, you will develop a predictive maintenance system using machine learning techniques. The goal is to predict machine failures based on sensor data from industrial equipment. You will work with a dataset containing various sensor measurements and use **two different machine learning models** of your choice.

Dataset

You will use the "AI4I 2020 Predictive Maintenance Dataset" from the UCI Machine Learning Repository.

https://archive.ics.uci.edu/dataset/601/ai4i+2020+predictive+maintenance+dataset

The dataset includes the following features:

- Air temperature [K]
- Process temperature [K]
- Rotational speed [rpm]
- Torque [Nm]
- Tool wear [min]

The target variable is 'Machine failure' (0 for no failure, 1 for failure).

Deliverables

- A Jupyter notebook containing all the code, visualizations, and explanations for each task (each group submits one)
- A brief summarization your approach, key findings, and recommendations in final report as part two.

Evaluation Criteria

- Correctness and completeness of the implemented tasks
- Quality of code and adherence to best practices
- Depth of analysis and insights derived from the data and models
- Clarity of explanations and visualizations
- Criteria of model selection, model improvement strategies
- Justification for choices made throughout the project