ML Attachment Task 1:

Topic: Python, ML, REST API (FAST API)

Submission: -----.

Project name: Predictive Maintenance Model Training and Evaluation

Objective: Preprocess the dataset, train a machine learning classification model for predictive maintenance, and test the model through an API.

Data source: <https://www.kaggle.com/datasets/shivamb/machine-predictive-maintenance-classification>

Instructions:

Data Preprocessing:

1. Handle any missing or inconsistent data

2. Process the data (i.e.: normalize, encode)

3. Save the cleaned and preprocessed dataset to a new file within the container.

Model Training and Evaluation:

1. Split the preprocessed dataset into training and testing sets

2. Train a classification model (e.g., Random Forest, Support Vector Machine, or Logistic Regression) using the training set.

3. Evaluate the model using performance metrics.

4. Visualize the results via plots.

5. Save the trained model in proper format.

API Development:

1. Develop a Python Flask/FAST API within the Docker environment that loads the trained model and accepts new input data via POST requests.

2. The API should output model predictions for the new data, allowing external users to test the model's performance.

3. Test the API locally to ensure it correctly accepts input data, processes it, and returns predictions.

Final Deliverables:

Submit the following items in a zip file, containing:

Data and Models: The preprocessed dataset, trained model, and model evaluation results (metrics and visualizations).