Plan Logic: Electric Motor Temperature Prediction Using Machine Learning

This document explains the logical planning steps required to build a machine learning system for predicting the temperature of an electric motor. The plan covers data collection, processing, model training, deployment, and monitoring.

1. Problem Definition

Goal: Predict the internal temperature of an electric motor using operational sensor data so that overheating can be prevented.

2. Data Collection Plan

- Install IoT sensors on electric motors
- Collect parameters such as voltage, current, torque, speed, and ambient temperature
- Capture data at regular intervals
- Store raw sensor data for analysis

3. Data Preparation Logic

- Clean sensor data and remove noise
- Handle missing or incorrect values
- Normalize numerical values
- Create derived features such as load ratio and rolling averages

4. Model Development Plan

- Split data into training and testing datasets
- Select suitable regression algorithms
- Train models to learn the relationship between inputs and motor temperature
- Evaluate model accuracy using metrics such as RMSE or MAE

5. Model Deployment Logic

- Export trained model
- Deploy model as an API or service
- Integrate with IoT data stream
- Enable real-time temperature prediction

6. Monitoring and Alert System

- Monitor predicted temperature continuously
- Set threshold limits for overheating
- Generate alerts when temperature crosses limits
- Send notifications to maintenance team

7. Continuous Improvement

- Collect new operational data
- Retrain the model periodically
- Improve prediction accuracy
- Update deployed models