Assignment – Group Work

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Week 3 Assignment: Predicting Bearing Failures in Industrial Motors

Problem Statement

Predict bearing failures in industrial motors using vibration sensor data. The goal is to identify bearings likely to fail within the next 30 days, minimizing downtime and maintenance costs.

ML Canvas Template

Decisions:	ML Tasks:	Value Propositions:	Data Source:	Data Collection:
Prioritize bearings needing replacement based on failure probability. Schedule maintenance.	Input: Vibration amplitude, temperature, RPM. Output: Probability of failure. Task: Binary classification.	Extend equipment lifespan, reduce costs, ensure safety.	Vibration sensors, motor logs.	Collect real-time sensor data and historical maintenance records.

	Offline Evaluation:		Features:	Building Models:
	Use F1-score and ROC-AUC on historical test data		Mean vibration, peak temperature, operating hours	Train a model (e.g., Random Forest) on 6 months of historical data. Retrain monthly.

Making Predictions:

The model predicts failure probability using real-time sensor data (vibration, temperature) and triggers maintenance alerts if the probability exceeds 80%.

Evaluation and Monitoring:

Track prediction accuracy monthly. Alert if accuracy drops below 85%.