EAT40005 Engineering Technology Projects A

Individual Work Log

PROJECT NAME:	OBD-II Based Predictive Maintenance System		
STUDENT NAME:	**Dang Khoa Le**		
STUDENT ID:	**103844421**	**WEEK # (& dates covered):**	**#6**

TASKS	STATUS	TIME SPENT	ACTION ITEM/NOTE
Task	**Status**	**Time Spent**	**Action Item/Note**
Presented progress to client (Week 6 review & findings)	Completed	1.5 hours	Summarized key feature correlations from datasets and proposed predictive models
Continued OBD-II hardware research	Completed	2 hours	Investigated real-world use of ELM327, Raspberry Pi setup, and hardware compatibility
Budget proposal planning	Completed	1 hour	Prepared budget breakdown and sourcing for devices/software for approval
Feature correlation analysis	Completed	2 hours	Identified top predictors from 3 datasets; analyzed statistical metrics and importance
Shared past experience in industrial dataset cleaning (Ericsson 5G)	Completed	2.5 hours	Demonstrated preprocessing, grouping, and anomaly detection techniques to team
Dataset cleaning and processing workshop with team	Completed	2 hours	Provided guidance on structuring large datasets, correlation mapping, and pretraining strategies
External dataset review and alignment	Completed	1 hour	Evaluated SCANIA, Hyundai, Ford, and UCI datasets; shortlisted 2 suitable for model fine-tuning (XGBoost, RandomForrest)
TOTAL WEEKLY TIME SPENT		**13 hours**	

TASKS PLANNED FOR NEXT WEEK	EXPECTED COMPLETION
Get OBD-II (2 units)	Week 7
Begin physical data collection using OBD-II adapter	Week 7
Evaluate differences between simulated and real-time data	Week 7-8
Having discussion on data science tasks early in the week with the unit and client.	Week 7

Summary/weekly reflection for Week 5:

- Key Tasks Done:
- Delivered client presentation covering dataset insights, hardware planning, and correlation analysis of features most predictive of vehicle maintenance.
- Explored and shared practical knowledge of OBD-II hardware setups, including Raspberry Pi integrations.
- Led team knowledge sharing session on data mining and industrial dataset preprocessing using Ericsson 5G experience as reference.
- Created a detailed budget proposal and finalized a shortlist of external datasets for training.
- Understand furthermore on the actual production that the client is operating.

- Key Learning:
- Gained clarity on feature prioritization for predictive maintenance models (e.g., RPM, engine temp, battery status).
- Understood budget allocation considerations and hardware-software compatibility.
- Improved ability to guide peers through large-scale dataset handling and preprocessing techniques.
- Developed insights into the importance of real-world data for improving model generalizability and reducing false positives.

- Literature/Resources Reviewed:
- Research papers on automotive sensor analytics, LSTM for time-series anomaly detection, and autoencoder frameworks.
- OBD-II hardware documentation (ELM327 compatibility, data formats).
- Kaggle datasets and UCI repository documentation.

- Issues Faced:
- Limited access to real-time (client) data this week; physical setup scheduled for next to test on individual vehicle or the unit supervisor's vehicle.
- Some datasets required advanced feature engineering to align with OBD-II input structure.
- Uncertainty around access to certain sensor data via standard OBD-II protocols (e.g., brake pad condition, tire wearing. tire-pressure), some older vehicle-models may not fully support OBD-II too.