Project Initialization and Planning Phase

Date	15 July 2024
Team ID	SWTID1720090652
Project Title	Predictive Modelling for Fleet Fuel Management using Machine Learning Techniques
Maximum Marks	3 Marks

Project Proposal (Proposed Solution) template

This project proposal outlines a solution to address a specific problem. With a clear objective, defined scope, and a concise problem statement, the proposed solution details the approach, key features, and resource requirements, including hardware, software, and personnel.

Project Overview	
Objective	The project aims at assisting fleet managers by using a ML model that predicts the amount of fuel consumed by a vehicle, hence enabling effective management of fleets, in addition to preventing fraudulent activities.
Scope	A case is considered where there is a subset of factors, both external and internal, like internal and external temperature, and weather. Factors like time-series are overlooked.
Problem Statement	
Description	Fleet management often faces challenges in effectively monitoring and optimizing fuel consumption, which is a significant operational cost. Additionally, fraudulent activities related to fuel usage can lead to substantial financial losses and inefficiencies. Current methods of tracking fuel consumption are often inaccurate and reactive, lacking the predictive capabilities necessary for proactive management and fraud prevention. Therefore, there is a need for a robust and predictive solution to accurately estimate fuel consumption for each vehicle in a fleet, allowing managers to optimize operations, reduce costs, and prevent fraudulent activities.
Impact	Solving this problem will significantly reduce operational costs by optimizing fuel consumption and preventing fraudulent activities. Accurate fuel predictions enable better route planning, driving

	behaviors, and maintenance schedules, enhancing overall fleet efficiency. Additionally, it contributes to environmental sustainability by lowering carbon emissions. The insights derived from data empower fleet managers to make informed decisions, improving vehicle longevity and reducing downtime. This solution also provides a competitive edge through cost leadership and operational excellence, while ensuring compliance with regulatory requirements related to fuel usage and emissions.
Proposed Solution	
Approach	The project involves a wide use of preprocessing and data cleaning techniques so as to deal with null values and outliers. It also uses tools to visualize the data using libraries such as numpy, seaborn and scikit-learn. It also uses Support Vectors for prediction of results, leading to a good deal of accuracy.
Key Features	The unique aspects of the solution are that the interface is very simple to easy and straightforward to use, and that fleet managers who are not tech savvy, can use it without any issues. It also provides good accuracy on predictions.

Resource Requirements

Resource Type	Description	Specification/Allocation
Hardware		
Computing Resources	CPU/GPU specifications, number of cores	Intel Core i5, any entry level GPU (GeForce GTX 1650) to speed up operations.
Memory	RAM specifications	8 GB
Storage	Disk space for data, models, and logs	512 GB SSD
Software		
Frameworks	Python frameworks	Flask
Libraries	Additional libraries	scikit-learn, pandas, numpy, seaborn
Development Environment	IDE, version control	Jupyter Notebook, Git

Data		
Data	Source, size, format	Kaggle dataset, 400 rows of data in an .xlsx file