

# Repos: Hackathon Challenge for IIT-B:

## Build a Smart Fuel Intelligence Platform

### Problem Statement:

Businesses depend on fuel for their daily operations and consume it in large quantities. While mobile fuel delivery options have emerged over the last few years, they continue to seek developments for bringing more efficiency to businesses. With the emergence of AI over the last couple of years, we aspire to build a system wherein predictive analysis could help advance these deliveries by identifying factors related to environment, economics, and lifestyle. Industries that rely on vehicles and machinery — such as transport fleets, generators, or construction equipment — face challenges in managing fuel efficiently, predicting consumption, and detecting operational issues. These inefficiencies result in higher costs, poor planning, and increased carbon emissions.

In this hackathon, your goal is to develop a Fuel Intelligence Platform powered by AI/ML that can:

- Predict future fuel consumption
- Detect anomalies and inefficiencies
- Generate actionable insights
- Present this information through a clean, integrated UI/UX dashboard

### Dataset:

You will receive a [sample dataset](#) (20 rows) that mimics real-world fuel logs. It contains:

- Missing values
- Spikes and outliers
- Irregular operating patterns

Using the provided features in the dataset, you'll need to build a model based on data that closely resembles real-world scenarios.

References used in the above dataset:

- [EPA Fuel Economy Data](#)
- [UCI Auto MPG Dataset](#)
- [Kaggle: Hourly Energy Consumption](#)
- [Canada Fuel Ratings](#)

## EXPECTED DELIVERABLES

### What You'll Build:

- Predict upcoming fuel consumption per equipment type using past behaviour and conditions
- Detect anomalies, such as fuel theft, unexpected drops, high idle time, or abnormal usage
- Generate insights such as efficiency tips, early warnings, or refuelling suggestions
- Present everything through an interactive dashboard that clearly communicates data and insights

### UI/UX Dashboard Requirements:

Create a web-based dashboard to:

- Display live (simulated) fuel stats
- Visualise predictions, efficiency insights, and alerts
- Integrate your backend model - the dashboard should reflect real-time interaction
- Focus on smoothness, clarity, and responsiveness

### Submission Format:

Submit your work in a .zip file named: `_FuelIntel.zip`

It must include:-

- `src/`: Source code
- `data/`: Dataset used
- `report.pdf`: 2-4 page write-up
- `demo.mp4` (optional): UI walkthrough

- README.md: Setup and team info
- requirements.txt: Dependencies

## Evaluation Criteria:

### Model Quality (30%)

- Prediction performance and generalisation
- Model Structure and Validation

### Data handling (20%)

- Handling noise and missing values
- Anomaly tagging and contextual detection
- Closeness to real-world data (with the given features in the given dataset)

### Insight Generation (20%)

- Actionable, relevant insights derived from data

### UI/UX Dashboard (30%)

- Visual clarity and responsiveness
- Data simulation and extrapolation
- Anomaly tagging and contextual detection