**GROUP:** GROUP 30  
**Program:** AI for Software Development  
**SDG Focus:** SDG 9 – *Industry, Innovation, and Infrastructure*  
**Project Title:** *Predictive AI Model for Equitable Distribution of Auto Repair Resources*

**SDG Problem Addressed**

Access to reliable motor vehicle repair and towing services is essential to maintaining resilient infrastructure and supporting economic growth. However, many communities—particularly in underdeveloped or rural areas—lack sufficient access to ASE-certified mechanics and properly distributed repair facilities. This creates inefficiencies, prolonged downtimes, and unequal access to critical industrial services, directly impacting mobility and logistics networks.

**AI/ML Approach**

Using a dataset on **Motor Vehicle Repair and Towing** services, this project employed the following machine learning and data analysis techniques:

* **Preprocessing & Cleaning**: Handled missing values, standardized column names, and filtered for relevant data points such as ZIP codes, city, state, and certified mechanics.
* **Exploratory Data Analysis (EDA)**: Used histograms, bar charts, and boxplots to visualize geographic disparities and mechanic distribution.
* **Modeling**: Applied **Linear Regression** to predict the number of certified mechanics based on location attributes.
* **Tools Used**: Python, Pandas, Seaborn, Matplotlib, Scikit-learn

**Results**

The model revealed stark geographic disparities in the distribution of auto repair services. Key insights include:

* Some ZIP codes have minimal or no access to certified mechanics.
* Urban areas are saturated, while many rural locations remain underserved.
* Boxplots exposed state-level inconsistencies in certified mechanic availability.

These results can support policy decisions, investment in training programs, and strategic placement of new service centers.

**Ethical Considerations**

* **Bias in Data**: Most data points are concentrated in Maryland, potentially skewing model generalizability to other states.
* **Equity & Access**: Care must be taken to ensure AI-driven decisions do not reinforce existing disparities.
* **Data Privacy**: No personally identifiable information (PII) was used, maintaining ethical standards in data handling.

**Conclusion**

This project demonstrates how AI can help solve practical infrastructure problems and supports **SDG 9** by:

* Enabling data-driven workforce planning
* Guiding equitable service distribution
* Fostering innovation in industrial logistics

With continued development, this model can scale into a decision-support tool for governments, repair businesses, and community planners—proving that AI, when thoughtfully applied, is a true engine of sustainable progress.