Summary of Key Insights

Inference and Recommendations

- **Data loading and preparation**:
- **Missing values**: Removed 108 columns which has null values in entire column & rest of the null values replaced with their mean value respectively
- **Duplicate values**: no duplicate values found
- **Numerical columns**: have created separate data set of numeric data type from cleaned data. Found hidden null values in vibration status column name, have dropped the column
- **Categorical columns**: have created separate data set of object data type from cleaned data
- **Outliers**: There were some outliers present in 8columns and I have capped the outliers

Data visualization

For Fuel Economy:

- Speed: if the speed is more than 60kmph then the fuel economy is optimum
  Recommendation: maintain speed around 60kmph for better fuel economy
- RPM: max rpm is 2000, at Approx 700 rpm fuel economy is high and if the rpm rises from that the fuel economy decreases
  Recommendation: maintain rpm between 700 to 950 for best fuel economy
- Engine torque percent: when the Engine torque percent increasing then fuel economy decreasing
  Recommendation: maintain Engine torque percent
- Engine load: when the Engine load increases then fuel economy decreasing
  Recommendation: maintain Engine load to get best fuel economy

For vehicle preformance:

- Coolant: when the coolant is more than 80 then the fuel economy is good and the coolant helps to maintain the vehicle performance
  recommendation: maintain coolant above 80 for best fuel economy as well as for good vehicle condition

For emissions:

- Adbluelevel: Adbluelevel helps to maintain vehicle and it also controls pollution (emissions)
  Recommended: maintain fuel level it has positive correlation to adbluelevel

Feature Engineering:

- converted 3 categorical columns to numeric columns

Standardization

- standardised the data to uniform range