1. Speed Violation: It checks the speed of the system and returns the location at which the speed of the system exceeded the permissible value.

   Input:

   - Latitude
   - Longitude
   - GPS Time
   - Speed (GPS)(km/h)

   Output:

   - Latitude
   - Longitude

2. Coolant Temperature: It compares the value of coolant temperature with that of the predefined values of coolant temperature to check whether the system is running in the safe state or not.

   Input:

   - Engine Coolant Temperature(Â°C)
   - Engine Load(%)
   - Trip Time(Since journey start)(s)

   Output:

   - Prints whether the system is running in safe state or not along with the plot of engine coolant temperature.

3. Distance Average: It checks the fuel used, distance travelled by the fuel used, fuel left in the system along with the expected distance it has travel in the remaining fuel.

   Input:

   - Trip Distance(km)
   - Fuel Remaining (Calculated from vehicle profile)(%)
   - Kilometers Per Litre(Instant)(kpl)

   Output:

   - Total Distance Covered
   - Fuel used to cover that distance
   - Average distance covered in that fuel
   - Expected distance covered

4. Load Analysis: Analyzing whether the engine is working under the rated load level or exceeding the recommended values.
   Input:

- Engine Load(%)
- Engine RPM(rpm)
- peed (GPS)(km/h)

Output:

- Engine is overloaded or not.

5. Lean-Burn Instances: The number of instances when the combustion is lean i.e. More air and less fuel. The instances when NOx is emitted.
   Input:
   - O2 Volts Bank 1 sensor 2(V)

   Output:

   - Count of instances when NOx emissions happened.
6. Rich-Burn Instances: The number of instances when the combustion is rich i.e. More fuel and less air. The instances when CO and HC are emitted.
   Input:
   - O2 Volts Bank 1 sensor 2(V)

   Output:

   - Count of instances when CO and HC emissions happened.
7. Geo-Fencing: An imaginary area around a GPS location to determine how many number of times the vehicle enters or leaves the area. It triggers an alert or event.
   Input:
   - Index

   Output:

   - Graph indicating vehicle is inside or outside the geofence.

8. Finding Potholes: Finding and structuring the potholes present in the road gradient for future purpose. Taking acceleration into considering, separating the potholes into low, mid and high level pothole gradient.
   Input:
   - Acceleration Sensor(Z axis)(g)
   - Track sheet

   Output:

   - Plot of potholes at different latitudes and longitudes
   - Map of all the potholes in the given area.
9. Traffic: Taking consideration of the speed of the system the given road is being verified as high, moderate and low congested area.
   Input:
   - Speed (GPS)(km/h)

- Latitude
- Longitude

Output:

- Count of Congested areas
- Map of the congested areas.