Problem Statement

Gps Toll Based System Simulation using Python

Unique Idea Brief (Solution)

The Solution offers a way to simulate vehicle movement and calculate the distance travelled by the vehicle based on the defined toll zones and gps coordinates.

Features Offered

Simulate Vehicle Movement
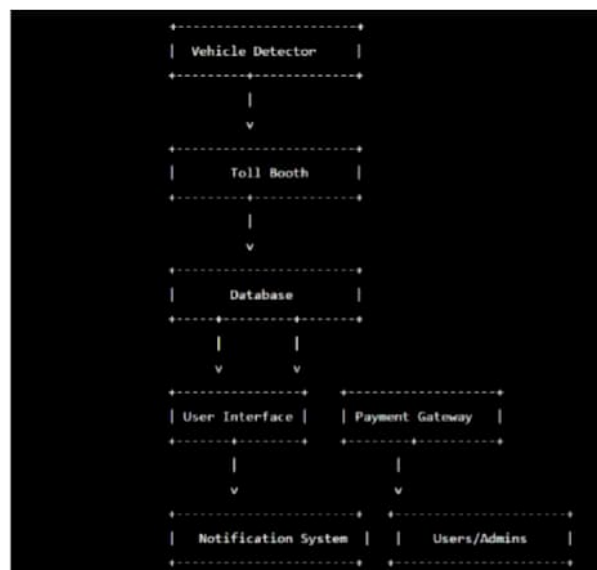Calculate Distance Travelled
Compute Toll Charges
Visualisation

Process flow

There is a simulation environment setup present which initialize starting and destination of the vehicle and with geopandas and shapely included we are checking toll crossings.

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Architecture Diagram

```
        +--------------------+
        |  Vehicle Detector  |
        +--------------------+
                 |
                 v
        +--------------------+
        |     Toll Booth     |
        +--------------------+
                 |
                 v
        +--------------------+
        |      Database      |
        +----+----------+----+
             |          |
             v          v
      +-------------+  +-------------------+
      | User Interface |  | Payment Gateway |
      +-------------+  +-------------------+
             |                  |
             v                  v
      +---------------------+  +---------------------+
      |  Notification System |  |   Users/Admins    |
      +---------------------+  +---------------------+
```

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Technologies used

Using Libraries and Frameworks like:-
Simulation Framework(simpy)
Geospatial Analysis (geopandas,shapely)
Distance Calculation (geopy)
Data Handling (pandas)
Visualization (matplotlib, folium)
(Bullet Points Included)

Team members and contribution:

Prajwal BG
Likitha N Swamy
Jeevan R

Conclusion

To conclude this project is very useful for
tolls in order to calculate the distance of a
vehicle in real time and does a proper
analysis to get a the payment charges of an
individual and it also helps to visualise the
distance travelled by a vehicle.