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Problem Statement ID:-1617

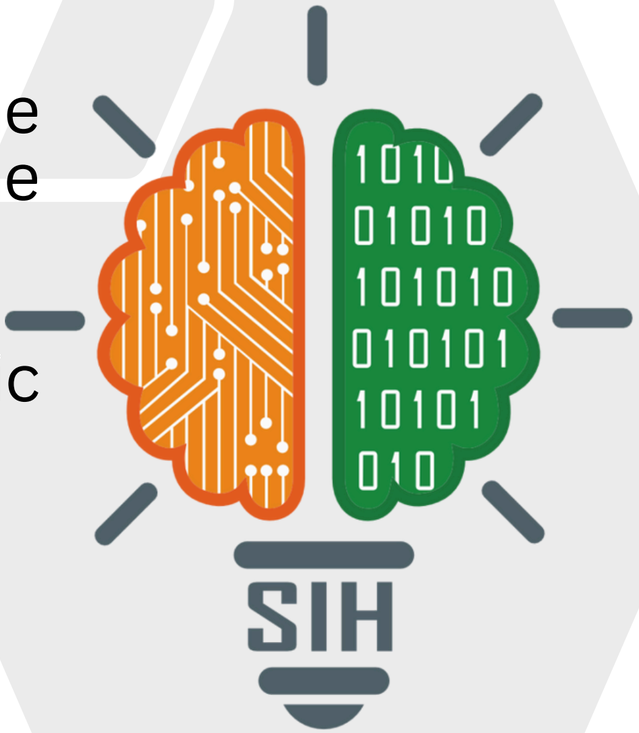
Problem Statement Title:-
Dynamic route rationalization model based on machine learning/AI would be required based on real-time traffic and road parameters.

Theme:- AI-Driven Intelligent Routing for Urban Traffic Management

PS Category:- Software

Team ID:-

Team Name:- YUKTI



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Dynamic route rationalization model based on machine learning / AI would be required based on real time traffic and road parameters

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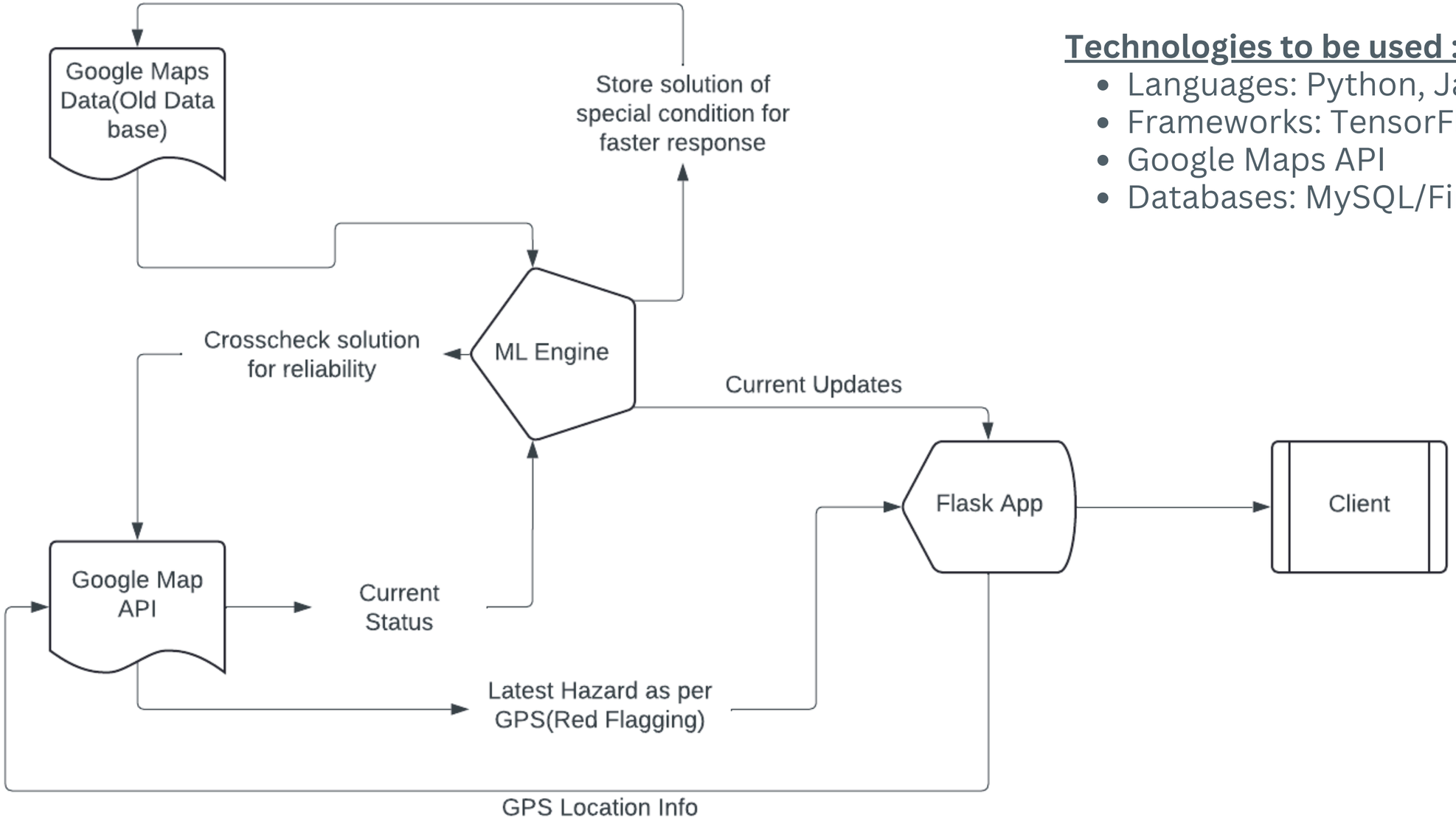
Proposed Solutions

- Our solution involves use of A* and Dijkstra algorithms, Google Maps API, Predictive models like Regression and Time series Analysis model and Deep Q Networks (DQN) to optimize and learn things
- Real time data is gathered from various sources like Google Maps API and Firebase database
- Then predictive model like Regression and Time series Analysis are used to predict time required to travel and traffic congestion by proccessing old data
- Then A* algorithm to calculate shortest path considering present traffic and road conditions and Dijkstra algorithm is used for to locate efficient path and real time updates
- Cloud Storage provides a space to store the live and archived data for flask app.
- Journey data is uploaded to firebase database

TECHNICAL APPROACH



Technologies to be used :

- Languages: Python, JavaScript
- Frameworks: TensorFlow, Flask
- Google Maps API
- Databases: MySQL/Firebase

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FEASIBILITY AND VIABILITY

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- Capacity of roads and utilization of roads
- Safety concerning traffic and assessment of risk
- Practically speaking, environmental impact (e.g., emissions, noise pollution) remains a major challenge.

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IMPACT AND BENEFITS:

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Impact

Optimized Public Transport Systems

- Enhanced Reliability: Minimizes wait times and stabilizes bus schedules.
- Increased Ridership: Promotes higher public transit usage.

Benefits

Operational & Environmental Efficiency

- Cost Reduction: Lowers operational expenses.
- Traffic Mitigation: Reduces vehicle count and congestion.

References:

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- Liu, Yanjun, et al. "Understanding urban bus travel time: Statistical analysis and a deep learning prediction." International Journal of Modern Physics B 37.04 (2023): 2350034.
- Zhong, Nan, Kaifeng Liu, and Yurong Li. "Deep Q-Learning Network Model for Optimizing Transit Bus Priority at Multiphase Traffic Signal Controlled Intersection." Mathematical Problems in Engineering 2023.1 (2023): 9137889.

Team Member Details

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