

ASSIGNMENT: MACHINE LEARNING–BASED NAVIGATION SYSTEM

Question 1: Machine Learning Model Creation

- Load the METR-LA dataset.
- Preprocess the dataset for machine learning.
- Select input features required for traffic speed prediction.
- Select traffic speed as the target variable.
- Train a regression-based machine learning model.
- Save the trained model as a serialized file.

Question 2: Backend Application Development

- Create a Python file named app.py.
- Import the required backend libraries.
- Load the saved machine learning model in app.py.
- Initialize the backend application.
- Create an API endpoint to accept input data.
- Use the machine learning model to predict traffic speed.
- Return the predicted speed as a JSON response.
- Run the backend application using Uvicorn.

Question 3: Backend Execution and Testing

- Start the backend server.
- Access the running API in a browser or test tool.
- Send sample input data to the API endpoint.
- Verify that the predicted traffic speed is returned correctly.

Question 4: Map Interface Development

- Create an HTML file for the frontend.
- Display a map on the web page.
- Allow the user to select a source location on the map.
- Allow the user to select a destination location on the map.

Question 5: System Integration

- Send the selected source and destination locations to the backend API.
- Use the predicted traffic speed to calculate travel time.
- Receive route and travel time data from the backend.
- Display the route on the map.
- Display the estimated travel time on the map.

End of Assignment