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**Problem 3:** Real-Time Traffic Monitoring System

**Scenario:**

You are working on a project to develop a real-time traffic monitoring system for a smart city

initiative. The system should provide real-time traffic updates and suggest alternative routes.

**Tasks:**

1. Model the data flow for fetching real-time traffic information from an external API

and displaying it to the user.

2. Implement a Python application that integrates with a traffic monitoring API (e.g.,

Google Maps Traffic API) to fetch real-time traffic data.

3. Display current traffic conditions, estimated travel time, and any incidents or delays.

4. Allow users to input a starting point and destination to receive traffic updates and

alternative routes.

**Deliverables:**

• Data flow diagram illustrating the interaction between the application and the API.

• Pseudocode and implementation of the traffic monitoring system.

• Documentation of the API integration and the methods used to fetch and display traffic

data.

• Explanation of any assumptions made and potential improvements.

FLOW CHART:

Start: User inputs Starting point and destination

Extract and Process Routes

Receive and prase API response

Construct APL URL and send GET request

Fetch Traffic Data Function

End: Display Traffic Information to User

Optional: Display Alternative Routes

Display Traffic Information

**IMPLEMENTATION:**

import requests

def fetch\_traffic\_data(start\_point, destination):

# Construct URL for Google Maps Traffic API request

url = "https://maps.googleapis.com/maps/api/directions/json"

params = {

"origin": start\_point,

"destination": destination,

"key": "YOUR\_API\_KEY",

"departure\_time": "now",

"traffic\_model": "best\_guess",

}

# Send GET request to the API

response = requests.get(url, params=params)

if response.status\_code == 200:

# Parse JSON response

data = response.json()

# Extract relevant traffic information

routes = data.get("routes", [])

if routes:

for route in routes:

# Get traffic information for each route

traffic = route.get("legs", [])[0].get("traffic\_speed\_entry", [])

duration = route.get("legs", [])[0].get("duration\_in\_traffic", {}).get("text", "Unknown")

# Display traffic information

print(f"Route: {start\_point} to {destination}")

print(f"Current traffic speed: {traffic}")

print(f"Estimated travel time: {duration}")

print("")

# TODO: Display alternative routes if necessary

else:

print("Error fetching data from Google Maps API")

# Example usage

if \_name\_ == "\_main\_":

start\_point = input("Enter starting point: ")

destination = input("Enter destination: ")

fetch\_traffic\_data(start\_point, destination)

DISPLAY THE DATA:

Enter starting point: 2

Enter destination: Nellore

OUTPUT:

