Project Title : Urban Traffic Analysis

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Objective of the project: Analys and visualize urban traffic patterns during peak hours.

Tools & Libraries: Tools and Libraries Used in the Urban Traffic Analysis Script

1. Python

Python is the primary programming language used for scripting, data analysis, and visualization.

2. Libraries

1) <u>Pandas</u>

Purpose: Data manipulation and analysis.

Usage in the Script: Creating and managing a dataset (DataFrame).

Filtering and sorting data to identify peak traffic hours.

Installation:pip install pandas

2) <u>Matplotlib</u>:

Purpose: Data visualization.

Usage in the Script: Plotting traffic data (line graph). Highlighting peak traffic hours using vertical lines.

Installation: pip install matplotlib

Data Source: The current dataset used in the script is synthetic data created for demonstration purposes.

Using Real Data

<u>To analyse real traffic patterns</u>:

Traffic Data Sources:

City Transportation Departments: Publicly available datasets (e.g., Open Data portals for urban planning).

<u>Traffic APIs:</u>

Use APIs like: Google Maps Traffic API, TomTom Traffic API

IoT Sensors: Data collected from traffic cameras, smart sensors, or GPS devices.

Execution Steps: Here are the steps to execute and obtain the outputs for the Urban Traffic Analysis:

1. Install Python and Required Libraries Ensure Python is installed on your system.

Install the required libraries:

pip install pandas matplotlib

2. Save the Python Script Copy the code provided earlier and save it as urban_traffic_analysis.

3. Run the Script:

Execute the script in your terminal or command prompt:

python urban_traffic_analysis.py

This will display:

1. Console Output:

The peak morning and evening traffic details.

2. Graph: A visualization of traffic patterns during the whole day.

3. Obtain the CSV File:

The script generates a CSV file with the traffic data:

File name: urban_traffic_data.csv

Summary of Result:

Cause of Traffic: In peak hours the traffic is more and the reason behind this is because of people who are working in different sectors and also the students of either college or school Sometimes construction, accident & event also led to traffic.

Graph Visualizing: Here is the graph visualizing urban traffic patterns during peak hours. The green dashed line represents the morning peak hour (9 AM), and the red dashed line indicates the evening peak hour (6 PM).