

# Programming For Data Science

Subject Code: CSL 225

## Project Report



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# Project Title:

## City Traffic Monitoring Dashboard



# ABSTRACT:-

The "City Traffic Monitoring Dashboard" project aims to provide an insightful and interactive tool for analyzing urban traffic patterns using Python.

Leveraging data sourced from a centralized database, the project utilizes data processing, visualization, and analysis techniques to identify key traffic trends and bottlenecks. Implemented in Jupyter Notebook, the dashboard integrates real-time or historical data to assist city planners, commuters, and stakeholders in making data-driven decisions to optimize traffic flow. The initiative emphasizes efficient data handling, user-friendly visualization, and actionable insights, fostering sustainable urban mobility solutions.

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# OBJECTIVES

- **Traffic Data Analysis:** To analyze traffic data from the database center and identify trends, peak hours, and congestion hotspots.
- **Visualization:** To develop interactive charts and graphs for clear and intuitive representation of traffic patterns.
- **Real-time Monitoring:** To enable real-time traffic monitoring, ensuring quick identification of unusual patterns or bottlenecks.
- **Decision Support:** To provide actionable insights for urban planners and policymakers to enhance traffic management strategies.
- **Sustainability:** To promote efficient traffic solutions that reduce congestion, fuel consumption, and environmental impact.
- **User-Friendly Interface:** To design an accessible and responsive dashboard suitable for various stakeholders, including commuters and city officials.

# TASKS

- **Data Collection and Integration:**
  - Gather traffic data from the database center.
  - Clean and preprocess the data for analysis.
- **Dashboard Setup:**
  - Design the layout and functionality of the dashboard in Jupyter Notebook.
  - Choose appropriate libraries for data visualization (e.g., Matplotlib, Seaborn, Plotly).
- **Data Analysis:**
  - Perform exploratory data analysis (EDA) to uncover trends and patterns.
  - Identify key metrics like traffic density, peak hours, and congestion points.
- **Visualization Development:**
  - Create interactive charts, heatmaps, and graphs to visualize traffic data.
  - Implement filters for date, time, and location-based analysis.
- **Feature Implementation:**
  - Add real-time monitoring capabilities if applicable.
  - Include predictive models for traffic forecasting using machine learning (optional).

- **Testing and Debugging:**
- **Test the dashboard for accuracy and performance.**
- **Debug any issues in data handling or visualization.**
- **Documentation and Finalization:**
- **Document the code, methodologies, and findings.**
- **Prepare a user manual for the dashboard.**
- **Presentation:**
- **Prepare the final presentation of the project, including the objectives, methods, and results.**

# SUMMARY

The "City Traffic Monitoring Dashboard" project focuses on analyzing and visualizing urban traffic data to aid in efficient traffic management. By leveraging Python and Jupyter Notebook, the project integrates data from a centralized database to identify trends, peak congestion times, and potential bottlenecks. The dashboard employs advanced data analysis and interactive visualization techniques to present insights in an accessible format for city planners, commuters, and policymakers. Key features include real-time monitoring, customizable data views, and actionable insights to optimize traffic flow and promote sustainable urban mobility. The project aims to enhance decision-making and reduce the environmental impact of urban traffic congestion.

**Freedom to Make Life Choices and Infection Rates:** The weakest correlation was found between the freedom to make life choices and maximum infection rates. This result suggests that, although freedom and personal autonomy are vital for overall well-being, they may not have a direct or strong influence on infection rates. The spread of COVID-19 may be more closely linked to other factors like healthcare accessibility and social support, rather than the degree of personal freedom.





# TOOLS USED

THE TOOLS THAT WE HAVE USED IN THIS PROJECT ARE AS FOLLOWS:

## 1. JUPYTER NOTEBOOK

FOR CODE COMPILATION



## 2. VSCODE

ADDITIONAL CODING TASKS AND DEBUGGING



## 3. MICROSOFT EXCEL

PREPROCESSING DATASETS



## 4. GITHUB

CREATING REPOSITORY AND DOCUMENTING THE PROJECT



THANK YOU