Team leader: Mohit Saraswat

Assignment No - 1

Use Case: Traffic Volume Prediction

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1. Introduction

Traffic congestion is a major issue in urban cities, causing delays, increased fuel consumption, and pollution. Machine learning models can be used to predict traffic volume based on various factors such as time of day, weather conditions, and holidays. In this assignment, we explore the dataset used for traffic volume prediction, discuss its sources, potential issues, and different types of data included.

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2. Data

2.1 Data Sources

The dataset used for this use case is collected from traffic sensors placed on highways and urban roads. The sources of data include:

- **Government transportation agencies**: Data collected from highway monitoring systems.
- **Weather APIs**: Additional data regarding temperature, humidity, and precipitation.
- **GPS and IoT devices**: Real-time traffic data from navigation applications like Google Maps or Waze.
- **Historical records**: Previously recorded traffic data for pattern analysis.

2.2 Data Issues

During data collection and processing, several issues can arise:

- **Missing values**: Due to sensor failures or transmission errors.
- **Noisy data**: Sensor inaccuracies leading to incorrect readings.

- **Imbalanced data**: Certain times (e.g., rush hours) may have more data points than others.
- **Data inconsistency**: Different data sources may have different time intervals or formats.

2.3 Types of Data

The dataset contains various types of data:

- **Numerical Data**: Temperature, traffic count, humidity, wind speed.
- **Categorical Data**: Weather conditions (rain, snow, clear sky), holidays (yes/no), time of the day.
- **Time Series Data**: Historical traffic volume recorded at regular intervals.

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3. Problem Statement

The goal of this project is to develop a machine learning model that predicts traffic volume based on historical and real-time data. The model should be able to:

- Identify peak traffic hours.
- Analyze the effect of weather and holidays on traffic.
- Help city planners optimize traffic flow.
- Provide accurate predictions for real-time traffic management applications.

Conclusion

Traffic volume prediction is a critical application of machine learning in smart cities. By leveraging data from multiple sources and handling issues effectively,

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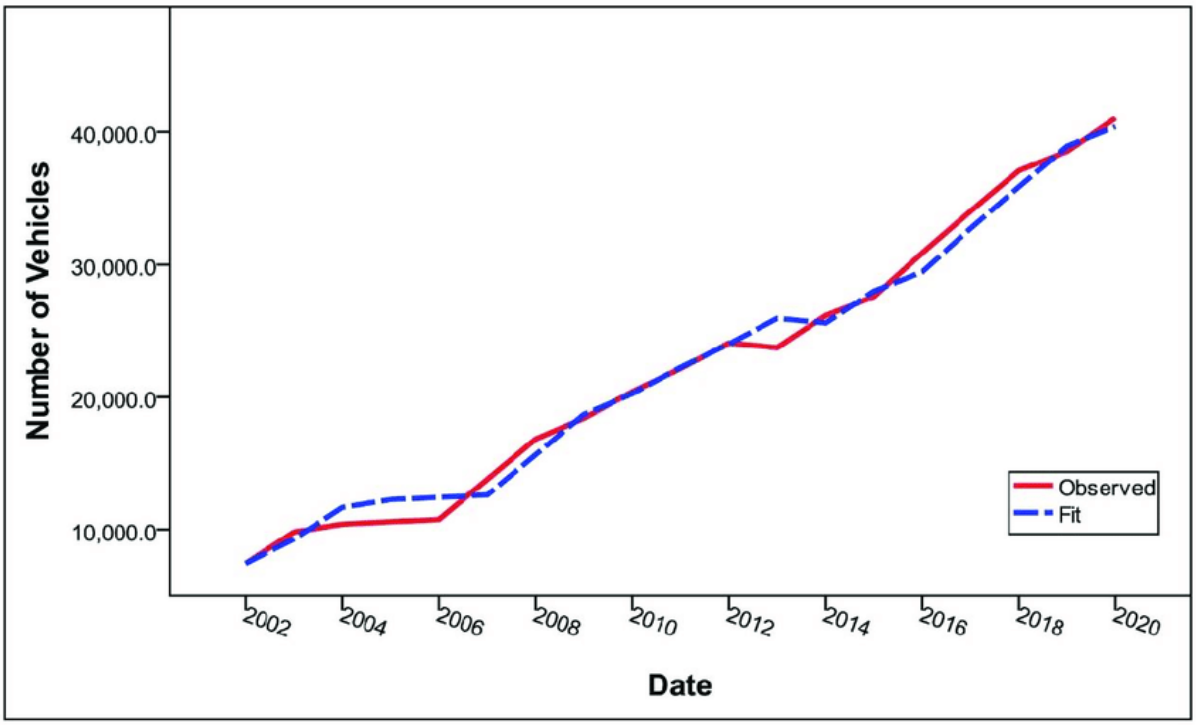

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