

Traffic Volume Prediction Project Documentation

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Team Size : 4

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I am Gaddati Abhishek(238x1a4224), I have submitted the project files and Demo Video Also ,Thank You smartBridge for providing me this golden Opportunity.

1. Overview

The Traffic Volume Prediction project aims to develop a predictive model that estimates traffic volume based on various input features. This project utilizes machine learning techniques to analyze historical traffic data and forecast future traffic conditions.

2. File Directory

The project directory structure is as follows:

Traffic Volume Prediction/

```
├── data/
|   ├── traffic_data.csv      # Historical traffic volume data
|   └── additional_data.csv   # Additional datasets (if any)
|
|   ├── models/
|       ├── model_training.py  # Script to train the model
|       ├── model_prediction.py # Script to make predictions
|       └── saved_model/       # Directory to save trained models
|
|   ├── evaluation/
|       ├── evaluate_model.py   # Script to evaluate model
performance
|       └── metrics.py         # Functions for calculating evaluation
metrics
|
|   ├── requirements.txt       # List of required Python packages
|   ├── README.md             # Project documentation
└── LICENSE                   # License information
```

3. Installation

To set up the project, follow these steps:

1. **Download the ZIP file:** Obtain the **Traffic Volume Prediction.zip** file.
2. **Extract the files:** Unzip the contents to your desired directory.
3. **Install dependencies:** Use the following command to install the required libraries:

```
pip install -r requirements.txt
```

4. Usage

To run the traffic volume prediction model, follow these steps:

1. **Load the data:** Use the provided scripts to load the historical traffic data.
2. **Train the model:** Execute the training script to train the model on the dataset.

```
python models/model_training.py
```

3. **Make predictions:** Use the prediction script to forecast traffic volume.

```
python models/model_prediction.py
```

5. Evaluation

The model's performance can be evaluated using various metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE). The evaluation scripts are included in the project.

1. **Run evaluation:**

python evaluation/evaluate_model.py

6. Additional Information

6.1 Introduction

- **Purpose:** Explain the significance of traffic volume prediction in urban planning and traffic management.
- **Scope:** Define the boundaries of the project, including what is covered and what is not.

6.2 Data Description

- **Data Sources:** Describe where the data is sourced from (e.g., government databases, sensors).
- **Data Features:** List and explain the features included in the dataset (e.g., time of day, weather conditions, historical traffic volume).

6.3 Methodology

- **Data Preprocessing:** Explain the steps taken to clean and prepare the data for modeling.
- **Model Selection:** Discuss the criteria for selecting specific machine learning models.
- **Training Process:** Describe how the models are trained, including any hyperparameter tuning.

6.4 Results

- **Model Performance:** Present the results of the model evaluations, including visualizations (e.g., graphs, charts).

- **Comparison of Models:** Compare the performance of different models used in the project.

6.5 Challenges and Limitations

- **Data Quality:** Discuss any issues related to data quality and how they were addressed.
- **Model Limitations:** Explain the limitations of the models used and potential areas for improvement.

6.6 Future Work

- **Enhancements:** Suggest potential enhancements to the model or methodology.
- **Real-time Predictions:** Discuss the feasibility of implementing real-time traffic volume predictions.

6.7 References

- List any academic papers, articles, or resources that were referenced during the project.

6.8 Appendices

- Include any additional information, such as code snippets, detailed results, or supplementary materials.

7. Contributing

Contributions are welcome! If you would like to contribute to this project, please fork the repository and submit a pull request.

8. License

This project is licensed under the MIT License. See the LICENSE file for more details.

9. Contact

For any inquiries or feedback, please contact the project maintainer at [238x1a4224@khitguntur.ac.in].