Delivery Time Prediction - Project Summary

Project Overview

This project aims to predict food delivery times using historical delivery data containing factors such as traffic level, weather, distance, preparation time, and courier experience.
Data was analyzed through Exploratory Data Analysis (EDA) and modeled using machine learning techniques to identify key drivers of delivery delays.

Dataset

- Records: 1,000 deliveries
- Features: Distance, Weather, Traffic Level, Time of Day, Vehicle Type, Preparation Time, Courier Experience, Delivery Time

Key Insights from EDA

1. Traffic Level and Weather significantly influence delivery time.
2. Longer distances and higher preparation times are linked to delays.
3. Off-peak deliveries tend to be faster.
4. Courier experience shows moderate impact on delivery speed.

Model Performance

Algorithm Used: Linear Regression
Mean Absolute Error (MAE): 5.90 min
Root Mean Squared Error (RMSE): 8.82 min
R^2 Score: 0.83 (82.6% variance explained)

Visual Results

Below are sample plots generated during the analysis, including:
- Correlation Heatmap
- Traffic vs Delivery Time Boxplot
- Weather Impact Analysis

Conclusion

The analysis highlights the significant impact of traffic and weather on delivery times. The trained model can

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help in operational planning, predicting realistic delivery estimates, and optimizing routes.