Weekly Progress Report

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Domain: **Data Science and Machine Learning**

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I. Weekly Activities & Progress

This week, my work focused on starting the actual forecasting part of the project and deepening theoretical understanding:

1. **Started building forecasting models:**

- Explored basic models to predict future traffic patterns at each junction.
- Experimented with classical time series approaches and simple regression to see initial results.

2. **Continued data exploration:**

- Looked deeper into how traffic changes by hour, weekday, and during holidays.
- Identified times of consistently high traffic peaks.

3. Studied probability & statistics:

- Started referring to a probability and statistics book to better understand distributions, variance, and how they relate to forecasting accuracy.

II. Milestones Achieved

1. Ran first basic forecasting models (baseline).
2. Added statistical analysis of traffic variance over time.
3. Documented initial findings on which days and times are most congested.
4. Began connecting theory (probability, variance) with practical dataset insights.

III. Challenges & Hurdles

- Deciding which forecasting method fits best given data granularity.
- Handling some missing or irregular timestamps that complicate modeling.
- Interpreting early model results to see what needs improvement.

IV. Lessons Learned

- Realized the importance of a good baseline model before moving to complex models.
- Understood how variance and distribution impact prediction reliability.
- Learned more about how holidays can skew average traffic levels.

V. Next Week's Goals:

- Refine and test forecasting models on clean data.
- Compare multiple methods (e.g., ARIMA, Prophet, or ML-based approaches).
- Visualize predicted vs. actual traffic to evaluate accuracy.

VI. Additional Comments:

This week was solid: I laid the groundwork for forecasting and dove into stats theory. Looking forward to refining models next.