**Weekly Progress Report**

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Domain: **Data Science and Machine Learning**

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**Week Ending: 04**

### I. Weekly Activities & Progress

This week, I focused on moving from simple forecasting models to more advanced machine learning approaches, and deepened my theoretical understanding:

1. **Machine learning study:**

· Started referring to a machine learning book to learn about supervised learning, regression, and time series forecasting methods.

· Read about how ML models like Random Forest and Gradient Boosting can handle tabular time series data.

1. **Continued data exploration:**

· Continued refining forecasting models built in previous weeks.

· Tried adding new features (e.g., moving averages, traffic lag variables) to improve prediction accuracy.

· Tested ML-based regressors as an alternative to classical time series models.

1. **Result Tracking :**

· Began comparing model outputs using error metrics (like MAE and RMSE).

· Saved baseline vs. ML model results for later presentation.

### II. Milestones Achieved

**1.** Completed first version of ML-based forecasting model.  
**2.** Added more engineered features to the dataset.  
**3.** Collected error metrics to evaluate and compare models.  
**4.** Continued connecting machine learning theory with real data.

### III. Challenges & Hurdles

* Choosing which features truly help the model vs. adding noise.
* Handling traffic spikes during holidays and weekends that ML models may not learn well..
* Tuning hyperparameters without overfitting to historical data.

### IV. Lessons Learned

* Learned how adding historical lag features can improve forecasting.
* Realized model performance depends heavily on data quality and feature design.
* Understood trade-offs between classical time series methods and machine learning

**V. Next Week's Goals:**

* Finish comparing ML models vs. time series baselines in detail.
* Select the most reliable model for final report.
* Prepare initial visualizations and explanation slides for project summary.

**VI. Additional Comments:**

Nothing extra this week — focused mainly on trying ML models and reading about machine learning concepts.