Report by: Lavannya Rautal

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| Internship Project Title | RIO-125: Forecasting System - Project Demand of Products at a Retail Outlet Based on Historical Data Batch 01 |
| Name of the Company | TCS |
| Name of the Industry Mentor | Shree Katayani |
| Name of the Institute | Vishwakarma University |

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**Acknowledgements**

I extend my sincere appreciation to my mentors and advisors for their continuous guidance and support throughout this phase of the internship. Their insights have been invaluable in shaping the project's progress.

**Objective**

This interim report outlines the significant developments and milestones achieved during Days 6 to 15 of the internship project, which focuses on developing a Forecasting System for product demand based on historical data.

**Introduction / Description of Internship**

In collaboration with Tata Consultancy Services (TCS), this internship centers on building a predictive model for product demand forecasting. The project encompasses data preprocessing, model implementation, hyperparameter tuning, and evaluation.

**Internship Activities**

**Approach / Methodology**

During this phase, the project made substantial strides in several key areas:

* **Data Preprocessing:** A rigorous data cleaning and sanitization process was initiated, addressing inconsistencies and missing values. The dataset is now in better shape for modeling.
* **Model Development:** The Exponential Smoothing algorithm was selected for demand forecasting. Model development began with coding, testing, and iterative refinement.
* **Hyperparameter Tuning:** Initial steps were taken towards hyperparameter tuning, a critical aspect of optimizing the model's performance.

**Assumptions**

The project continues to assume that historical sales data is indicative of future sales trends and that the chosen Exponential Smoothing algorithm is well-suited to the dataset.

**Exceptions / Exclusions**

The scope of the project still excludes real-time data integration and the incorporation of external factors.

**Charts, Table, Diagrams**

At this stage, no charts, tables, or diagrams have been generated. Visual aids will be integrated as the project advances.

**Algorithms**

The Exponential Smoothing algorithm remains the choice for demand forecasting. Development and fine-tuning of the model are ongoing.

**Challenges & Opportunities**

**Challenges Faced**

The challenges have evolved to include fine-tuning computational resource management during hyperparameter tuning and ensuring model optimization without overfitting.

**Opportunities**

The project continues to present opportunities for enhanced demand forecasting accuracy and real-world deployment of the model.

**Risk Vs Reward**

**Risk**

Resource constraints during hyperparameter tuning could potentially extend project timelines.

**Reward**

Efficient project setup and model optimization offer the potential for highly accurate demand forecasting.

**Reflections on the Internship**

This phase of the internship emphasizes the importance of meticulous data preprocessing and the iterative nature of model development. Challenges have been met with proactive problem-solving.

**Recommendations**

* Continue with rigorous data preprocessing and model development.
* Maintain a systematic approach to hyperparameter tuning.
* Monitor resource utilization during optimization.

**Outcome / Conclusion**

Days 6 to 15 have marked significant progress in data preprocessing and model development. The project remains on course, with a focus on refining the model's performance.

**Enhancement Scope**

Future work will involve hyperparameter tuning, model evaluation, and the eventual deployment of the forecasting system.