INTERNSHIP: STUDENT DAILY REPORT

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| Name of the Student | Vivek kumar Shriwas |
| Internship Project Topic | TCS iON RIO-125: Forecasting System - Project Demand of Products at a Retail Outlet Based on Historical Data |
| Name of the Organization | TCS iON |
| Name of the Industry Mentor | Sreekathiayini Ruthraiyah |
| Name of the Institute | Viswakarma University |

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| Date | Day | Hours Spent |
| 6/08/2023 | Day 20 | 3 hours and 30 minutes |
| Description:  **Self-learning Duration : 3 hours**  **Activity Report Duration : 30 minutes**  **Activities:**   1. **Exploring Machine Learning Algorithms for Time Series (1 hour):**    * Dived into the realm of machine learning algorithms suitable for time series forecasting.    * Researched popular algorithms such as Random Forest, Gradient Boosting, and Support Vector Machines adapted for time series data.    * Explored their strengths, weaknesses, and best practices for implementation. 2. **Implementing Random Forest for Time Series Forecasting (1 hour):**    * Chose the Random Forest algorithm as a starting point for experimenting with machine learning-based time series forecasting.    * Preprocessed a sample time series dataset, handling issues like missing values and seasonality adjustments.    * Designed a pipeline for training and evaluating the Random Forest model using time lag features. 3. **Analyzing Results and Tuning (1 hour):**    * Trained the Random Forest model and evaluated its performance using appropriate metrics such as Mean Absolute Error (MAE) and Root Mean Squared Error (RMSE).    * Observed initial results and identified areas for improvement.    * Delved into hyperparameter tuning to enhance the model's accuracy and robustness. 4. **Reviewing Ensemble Methods for Time Series (30 minutes):**    * Explored ensemble methods designed specifically for time series forecasting, such as Time Series Ensembles and Forecast Combination techniques.    * Understood the rationale behind using ensembles to mitigate the weaknesses of individual models and improve overall predictive performance.   **Challenges:** Implementing machine learning algorithms for time series forecasting introduced challenges in feature engineering and hyperparameter optimization. Achieving the right balance between model complexity and avoiding overfitting required careful experimentation. Additionally, fine-tuning the Random Forest model's parameters proved to be an iterative process. | | |