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 |
| 31/07/2023 | Day 14 | 3 hours and 30 minutes |
| Description:  **Self-learning Duration : 3 hours**  **Activity Report Duration : 30 minutes**  **Activities:**   1. **Studying Time Series Forecasting Methods (1 hour):**    * Delved deeper into various time series forecasting methods, including ARIMA, Exponential Smoothing, and Prophet.    * Explored the theoretical foundations of each method and their respective strengths and weaknesses.    * Compared the applicability of these methods to different types of time series data. 2. **Hands-on ARIMA Implementation (1 hour):**    * Implemented an ARIMA (AutoRegressive Integrated Moving Average) model using the **statsmodels** library in Python.    * Preprocessed a sample time series, including stationarity transformation and differencing.    * Tuned ARIMA hyperparameters (p, d, q) and observed their effects on the model. 3. **Interpreting ARIMA Results (45 minutes):**    * Analyzed the output of the ARIMA model, including parameter estimates, AIC/BIC scores, and residual diagnostics.    * Interpreted the significance of parameter estimates and their implications for the forecasting model.    * Identified potential areas for model improvement based on residual analysis. 4. **Exploring Exponential Smoothing Methods (30 minutes):**    * Investigated various exponential smoothing methods, such as Simple Exponential Smoothing and Holt-Winters.    * Understood how different smoothing factors and initializations impact forecasting accuracy.    * Compared exponential smoothing with ARIMA in terms of assumptions and results. 5. **Updating Learning Journal (15 minutes):**    * Documented the exploration of time series forecasting methods undertaken during the day.    * Included insights gained from implementing an ARIMA model and analyzing its output.    * Highlighted the challenges faced while interpreting ARIMA results and potential solutions.   **Challenges:** Understanding the interpretation of ARIMA model results, especially the diagnostic plots for residual analysis, posed a challenge. Further research and referencing additional resources were necessary to ensure accurate understanding and insights. | | |