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 |
| 4/08/2023 | Day 18 | 5 hours and 15 minutes |
| Description:  **Self-learning Duration : 5 hours**  **Activity Report Duration : 15 minutes**  **Activities:**   1. **Advanced ARIMA Concepts (2 hours):**    * Dived deeper into ARIMA modeling by exploring advanced concepts such as seasonal ARIMA (SARIMA) and SARIMA-X.    * Understood the importance of incorporating seasonality and exogenous variables in improving forecasting accuracy.    * Explored methods to identify optimal values for seasonal components (P, D, Q) and tested the models on relevant datasets. 2. **Hands-on SARIMA (1 hour):**    * Implemented a seasonal ARIMA model on a real-world time series dataset using Python's **statsmodels** library.    * Conducted model diagnostics, including residual analysis and model performance evaluation on both in-sample and out-of-sample data.    * Grasped the importance of selecting appropriate lag values and understanding their impact on the model. 3. **Data Visualization for SARIMA (1 hour):**    * Recognized the significance of data visualization in both understanding the underlying patterns and communicating findings.    * Created visualizations to compare the original time series, the predicted values, and the actual values from the SARIMA model.    * Noted the importance of interpreting the visualizations to fine-tune the model and make informed decisions. 4. **Research on Exogenous Variables (1 hour):**    * Explored the concept of exogenous variables and their role in time series forecasting.    * Researched potential sources for relevant exogenous data that could enhance the accuracy of forecasting models.    * Discussed the challenges associated with integrating exogenous variables and potential strategies to address them. 5. **Reflective Learning (15 minutes):**    * Took a moment to reflect on the newly acquired knowledge of SARIMA modeling and its applications.    * Recognized the complexity of incorporating seasonality into models and the need for careful parameter tuning.    * Acknowledged the need for further exploration of exogenous variables and their impact on forecasting precision.   **Challenges:** The main challenge encountered was in identifying appropriate exogenous variables that could significantly contribute to the accuracy of SARIMA models. Additionally, understanding the nuances of seasonality and selecting optimal seasonal components for the SARIMA model required iterative experimentation. | | |