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 |
| 2/08/2023 | Day 16 | 3.3 hours and 30 minutes |
| Description:  **Self-learning Duration : 3.3 hours**  **Activity Report Duration : 30 minutes**  **Activities:**   1. **Introduction to Exponential Smoothing (1 hour):**    * Dived into the concept of exponential smoothing as another essential time series forecasting method.    * Explored different variants: Simple Exponential Smoothing, Holt's Linear Exponential Smoothing, and Holt-Winters' Exponential Smoothing.    * Understood the importance of smoothing factors in capturing different patterns. 2. **Implementing Simple Exponential Smoothing (1 hour):**    * Focused on the implementation of Simple Exponential Smoothing using the **statsmodels** library.    * Comprehended the role of the smoothing parameter (alpha) in giving more weight to recent observations.    * Evaluated the performance of the model on sample data and discussed its limitations. 3. **Holt's Linear Exponential Smoothing (1 hour):**    * Learned about Holt's Linear Exponential Smoothing, which accounts for both trend and level in the time series data.    * Understood the equations governing the level and trend components in the forecasting process.    * Examined scenarios where Holt's Linear method outperforms Simple Exponential Smoothing. 4. **Holt-Winters' Exponential Smoothing (45 minutes):**    * Explored the extension of Holt's Linear method to incorporate seasonality using Holt-Winters' Exponential Smoothing.    * Understood the additive and multiplicative seasonality versions and the respective equations involved.    * Implemented the Holt-Winters' method on a sample dataset and compared its results with the previous models. 5. **Reflective Learning (15 minutes):**    * Dedicated time to reflect on the significance of exponential smoothing techniques in time series forecasting.    * Jotted down the key takeaways, including the use cases, advantages, and challenges of each method.    * Outlined potential areas for further exploration and application of these methods.   **Challenges:** Understanding the nuances of exponential smoothing methods, particularly the equations and the impact of smoothing parameters, required meticulous review and practice. Differentiating between the variants and deciding when to apply each technique was initially confusing but became clearer through hands-on implementation and conceptual clarification. | | |