**Weekly Progress Report**

**Name:** Ayan Memon  
**Domain:** Data Science and Machine Learning  
**Date of Submission:** 24 - 02 - 2025

**Week Ending:** 04

**I. Overview:**

This week, I focused on building a strong foundation in **Machine Learning**. I started by watching an **introductory video** and reviewing a **presentation** on key Machine Learning concepts. Additionally, I studied the book **"Introduction to Machine Learning"** by **Alex Smola and S.V.N. Vishwanathan**. To reinforce my understanding, I completed a **quiz** covering the topics I had learned.

**II. Achievements:**

1. **Video & Presentation Study:**
   * Watched an **introductory video on Machine Learning**.
   * Reviewed a **PowerPoint presentation** covering key ML concepts, algorithms, and real-world applications.
2. **Book Study:**
   * Read **"Introduction to Machine Learning"** by **Alex Smola and S.V.N. Vishwanathan**.
   * Developed a solid understanding of core **ML algorithms**, including:
     + **Supervised and Unsupervised Learning**
     + **Linear Regression, Decision Trees, and Clustering**
3. **Quiz Completion:**
   * Completed a **quiz on Machine Learning** concepts.
   * Assessed knowledge on topics such as **data preprocessing, model evaluation, and different ML algorithms**.

**III. Challenges:**

1. **Complex Topics:**
   * Advanced concepts like **feature selection** and **hyperparameter tuning** were challenging and required additional effort to understand.
2. **Time Constraints:**
   * Managing time between **reading, video study, and quizzes** while balancing other tasks was slightly difficult.

**IV. Learning Resources:**

* **"Introduction to Machine Learning"** by **Alex Smola and S.V.N. Vishwanathan**.
* **Introductory Machine Learning video and PowerPoint presentation**.
* **Online quizzes and exercises** to test understanding of ML concepts.

**V. Next Week's Goals:**

1. **Continued Learning:**
   * Study more advanced **Machine Learning topics**, including:
     + **Neural Networks, Deep Learning, and Reinforcement Learning**.
2. **Practical Applications:**
   * Apply **basic ML algorithms** to small datasets to understand their **real-world implementations**.
3. **Project Development:**
   * Begin integrating **Machine Learning techniques** into the following projects:
     + **Crop and Weed Detection**
     + **Predicting the Lifetime of a Bearing in Manufacturing**

**VI. Additional Comments:**

This week provided **a strong foundation in Machine Learning**, and I am eager to apply these concepts to **real-world problems and projects** in the upcoming weeks.