Weekly Progress Report

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Domain: Data Science and Machine Learning

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Week Ending: 03

I. Overview:

This week, the primary focus was on studying "An Introduction to Probability and Statistics". Covered core concepts from probability axioms to advanced hypothesis testing for data science foundation.

II. Achievements:

1. **Probability Foundations:**
   - Explored probability axioms, sample spaces, and finite sample spaces.
   - Successfully studied conditional probability and Bayes' theorem.

2. **Statistics:**

   Name of the project: Probability & Statistics Mastery
   - Completed random variables, discrete/continuous distributions study.
   - Covered moments, generating functions, and order statistics.

3. **Hypothesis Testing:**
   - Mastered Neyman-Pearson lemma and unbiased monotone likelihood tests.
   - Studied Chi-square tests, F-tests, and Bayes procedures.

III. Challenges:

1. **Advanced Testing Concepts:**
   - Encountered challenges with Neyman-Pearson hypothesis testing.
   - Ongoing efforts to master uniformly most powerful tests.

2. **Statistical Complexity:**
   - Faced complexity in general linear hypothesis and confidence estimation.
   - Seeking guidance for nonparametric inference understanding.

IV. Learning Resources:

1. **Course Material:**
   - Utilized "An Introduction to Probability and Statistics" textbook completely.
   - Studied chapters on distributions, hypothesis testing, and confidence intervals.
2. **Statistics Resources:**
   - Referenced statistical tables and selected problem answers.
   - Reviewed enumeration of theorems for deeper understanding.

V. Next Week's Goals:

1. **Practical Implementation:**
   - Address hypothesis testing challenges with Python SciPy implementation.
   - Apply probability concepts to data analysis projects.
2. **Project Integration:**
   - Implement statistical tests in Sales Analysis Dashboard.
   - Document Week 3 statistical learnings in GitHub portfolio.

VI. Additional Comments:

"Include any additional comments or observations regarding overall progress, collaboration, or notable experiences during the week."