ML & Stats Learning Plan

📖 24-Week Machine Learning & Statistical Learning Plan (R-Based)

This plan alternates theory (Casella & Berger) with practical ML using ISLR2 and R. Mini-projects are included every 2 weeks, and a larger project every month.

Week 1 — Starting 2025-07-28

ISLR2 Focus: Ch. 1–2: Intro, Linear Regression

Casella & Berger Focus: Ch. 1: Probability Review

- ☒ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 2 — Starting 2025-08-04

ISLR2 Focus: Ch. 3: Classification (Logistic, LDA)

Casella & Berger Focus: Ch. 2: Random Variables

Project Work:

🛠 Mini Project (Smaller)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete

Week 3 — Starting 2025-08-11

ISLR2 Focus: Ch. 3: Continue + Labs

Casella & Berger Focus: Ch. 3: Joint Distributions

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 4 — Starting 2025-08-18

ISLR2 Focus: Ch. 4: Resampling (CV, Bootstrap)

Casella & Berger Focus: Ch. 4: Expectation, Variance

Project Work:

🔑 Monthly Project (Larger)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete

Week 5 — Starting 2025-08-25

ISLR2 Focus: Ch. 4: Continue + R implementation

Casella & Berger Focus: Ch. 5: Limit Theorems

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 6 — Starting 2025-09-01

ISLR2 Focus: Ch. 5: Model Selection, Shrinkage

Casella & Berger Focus: Ch. 6.1–6.3: Estimators + Properties

Project Work:

✖ Mini Project (Smaller)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete

Week 7 — Starting 2025-09-08

ISLR2 Focus: Ch. 6: Continue + Labs

Casella & Berger Focus: Ch. 6.4–6.7: MSE, Consistency

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 8 — Starting 2025-09-15

ISLR2 Focus: Ch. 7: Nonlinear Methods (Splines, GAMs)

Casella & Berger Focus: Ch. 7.1–7.3: Sufficiency

Project Work:

🖋 Monthly Project (Larger)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete

Week 9 — Starting 2025-09-22

ISLR2 Focus: Ch. 7: Continue + R

Casella & Berger Focus: Ch. 7.4–7.7: Exp. Families

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 10 — Starting 2025-09-29

ISLR2 Focus: Ch. 8: Tree-Based Methods (DT, RF)

Casella & Berger Focus: Ch. 8.1–8.2: Point Estimation

Project Work:

⚒ Mini Project (Smaller)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 11 — Starting 2025-10-06

ISLR2 Focus: Ch. 8: Continue + Labs

Casella & Berger Focus: Ch. 8.3–8.5: MLE, MoM

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete

Week 12 — Starting 2025-10-13

ISLR2 Focus: Review + ML + Inference Mini Project

Casella & Berger Focus: Ch. 9: Confidence Intervals

Project Work:

📌 Monthly Project (Larger)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 13 — Starting 2025-10-20

ISLR2 Focus: Ch. 9: Support Vector Machines

Casella & Berger Focus: Ch. 10: Hypothesis Testing

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete

Week 14 — Starting 2025-10-27

ISLR2 Focus: Ch. 9: Continue + Tuning

Casella & Berger Focus: Ch. 11.1–11.3: NP Lemma

Project Work:

⚒ Mini Project (Smaller)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 15 — Starting 2025-11-03

ISLR2 Focus: Ch. 10: Unsupervised (PCA, Clustering)

Casella & Berger Focus: Ch. 11.4–11.6: UMP, LRT

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete

Week 16 — Starting 2025-11-10

ISLR2 Focus: Ch. 10: Continue + Viz in R

Casella & Berger Focus: Ch. 12: Bayesian Inference (opt.)

Project Work:

🖈 Monthly Project (Larger)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 17 — Starting 2025-11-17

ISLR2 Focus: Mini Project #1: Classification

Casella & Berger Focus: Review Ch. 6–11 + Proofs

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete

Week 18 — Starting 2025-11-24

ISLR2 Focus: Project + Evaluation + ROC/AUC

Casella & Berger Focus: Ch. 13: Inference Wrap-Up

Project Work:

🛠 Mini Project (Smaller)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 19 — Starting 2025-12-01

ISLR2 Focus: Deep dive: tidymodels/caret

Casella & Berger Focus: Simulation + Theory in R

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete

Week 20 — Starting 2025-12-08

ISLR2 Focus: Mini Project #2: Regression/Selection

Casella & Berger Focus: Statistical Derivations in R

Project Work:

🖈 Monthly Project (Larger)

  ☐ ISLR2 Task Complete
  ☐ C&B Task Complete
  ☐ Project Complete

Week 21 — Starting 2025-12-15

ISLR2 Focus: Paper reproduction + reporting

Casella & Berger Focus: Paper theory + stats support

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 22 — Starting 2025-12-22

ISLR2 Focus: Portfolio writing + visualizations

Casella & Berger Focus: C&B Review + Project Summary

Project Work:

⚒ Mini Project (Smaller)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete

Week 23 — Starting 2025-12-29

ISLR2 Focus: Wrap-up review + Final project design

Casella & Berger Focus: Finalize theory + test mastery

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete

Week 24 — Starting 2026-01-05

ISLR2 Focus: Capstone project: ML + Stats with Report

Casella & Berger Focus: Capstone Theory Component

Project Work:

🚀 Monthly Project (Larger)

- ☐ ISLR2 Task Complete
- ☐ C&B Task Complete
- ☐ Project Complete