Advanced Linear Regression Assignment

This assignment focuses on Weighted Least Squares and Locally Weighted Linear Regression (LWLR). It includes theoretical derivations and a coding implementation part.

Assignment Covers:

Part 1: Theoretical Derivations of Weighted Linear Regression (10 points)

Problem 1.1: Matrix Form of Weighted Least Squares

Problem 1.2: Normal Equation for Weighted Linear Regression

Problem 1.3: Maximum Likelihood Estimation and Weighted Linear Regression

Part 2: Coding - Locally Weighted Linear Regression (LWLR) (10 points)

Problem 2.1: Implement LWLR

Problem 2.2: Evaluate LWLR

Problem 2.3: Analyze the Bandwidth Parameter τ

Submission Instructions:

Submit a PDF document containing your derivations and analysis for Part 1 and Part 2. Additionally, submit a Python code file for Part 2.