Problem Statement: Optimizing Polynomial Degree in Regression The task in this project is to investigate how the degree of a polynomial regression model affects prediction accuracy and generalization. Given three datasets — training, validation, and testing — the goal is to fit polynomial regression models of varying degrees (from 1 to 10) and compare their performance. The process involves: 1. Fitting regression models to the training data using polynomial features of different degrees. 2. Evaluating the models on both training and validation datasets using the Root Mean Squared Error (RMSE). 3. Identifying the degree that minimizes the validation RMSE, which indicates the best trade-off between underfitting and overfitting. 4. Testing the chosen model on the test dataset to verify its generalization ability. The key objective is to determine the optimal polynomial degree that ensures accurate predictions while maintaining strong generalization to unseen data.