**K-nearest Neighbors Regressor for Wine Quality Prediction**

1. **Introduction**

This project implements a K-Nearest Neighbors (KNN) regressor from scratch using NumPy for predicting wine quality based on chemical attributes such as acidity, pH levels, residual sugar, and alcohol content. The model is trained on the white Vinho Verde wine dataset from northern Portugal, aiming to provide hands-on experience in data preprocessing, model building, and evaluation.

1. **Task Overview**

The tasks involve setting up the project, reading and preprocessing the dataset, building a KNN model with custom distance calculation and prediction methods, and performing D-fold cross-validation for model evaluation.

1. **Data Description**

The dataset consists of 4,898 instances with 12 attributes, including fixed acidity, volatile acidity, citric acid, and wine quality. The latter is treated as a continuous variable in this regression model project.

1. **Implementation**

The project is implemented in Python, utilizing NumPy for numerical operations. External machine learning libraries, such as scikit-learn, are not used to emphasize building the KNN model from scratch.

1. **Usage**
2. Clone the repository.
3. Run the Jupyter notebook or Python script.
4. Follow the tasks outlined in the notebook to set up, preprocess data, build, and evaluate the KNN regressor.