Pre-Exercise-Assignment
No Evaluation

Instructions. The goal of this problem set is to make you understand and familiarize with K-Nearest Neighbor Method and Classification Metrics.

Glass Material Classification

In this part of the assignment, you will implement a nearest neighbor algorithm to classify glass types of different glass . You will also extend your implementation as weighted KNN algorithm.

A dataset is provided for your training phase.You should use a subset of the training set to test the performance of your model. In other words, you should split your given dataset into two set; training set which will be used to learn model, and test set which will be used to measure the success of your model. You can use % 80 of your dataset for training and remaining % 20 of dataset for testing. Please also try to include every class type in the dataset for both training set and testing set when splitting the dataset into train and test sets.

Glass Classification Dataset [1]

- You can download the dataset from given link.
- Dataset consists of 214 samples with discrete 6 class types. (Type 4 class have no samples in the dataset, thus the dataset includes 6 different class types {"1", "2", "3", "5", "6", "7"})
- **Attribute Information:**
    1. RI: refractive index
    2. Na: Sodium
    3. Mg: Magnesium
    4. Al: Aluminum
    5. Si: Silicon
    6. K: Potassium
    7. Ca: Calcium
    8. Ba: Barium

9. Fe: Iron

10. Type: Type of glass: (class attribute)

Metrics

- You are expected to use different classification evaluation metrics such as "Accuracy", "Precision", "Recall" and "F1-Measure" from Scikit-Learn library.
  `https://scikit-learn.org/stable/modules/model_evaluation.html#classification-report`

- You are also expected to obtain a confusion matrix from Scikit-Learn:
  `https://scikit-learn.org/stable/modules/generated/sklearn.metrics.confusion_matrix.html#sklearn.metrics.confusion_matrix`

Implementation Details

- you can use Scikit-Learn library to directly use KNN and Weighted-KNN.
  `https://scikit-learn.org/stable/modules/generated/sklearn.neighbors.KNeighborsClassifier.html`

References

[1] `https://www.kaggle.com/uciml/glass`