

CENG 463 Homework 1 due to 17 October 2022 at 13.00.

### Implement a KNN classifier with Python.

#### Description:

Implement both `fit()` and `predict()` functions in the same function: `y_pred = fitAndPredict(X_train, y_train, X_test, n_neighbors)`. You may use other sklearn function such as accuracy and train/test data splitting.

Start with the Lecture 2 Jupyter Notebook then code your own implementation.

Replace these lines:

```
knn = KNeighborsClassifier(n_neighbors=5)
knn.fit(X_train, y_train)
y_pred = knn.predict(X_test)
```

with

```
y_pred = fitAndPredictKNN(X_train, y_train, X_test, n_neighbors,
test_ratio )
```

where `test_ratio` is between 0.1 to 1 selecting tested samples randomly.

#### Tests:

All features and individual features. 5 tests are required with  $K = 1, 3, \dots, 9$  and 11 for `test_ratio = 1`. Compare these findings with Sklearn.

Moreover, test the effect of test ratio for best performing  $K$ .

Measure and report computation times and classification accuracies in your notebooks.

You may group with another student, teams of 2 students are allowed.

Only your notebooks for your group will be submitted.

Add code comments and discuss your findings in the notebook.

Lecture2 Colab Link: <https://colab.research.google.com/drive/12R1uRQkMs6bWFA-ZeCmtK9xBVil-uaUP?usp=sharing>

Please make a copy to your account.

Good Luck

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