**TASK A**

Use the data-handler to select "A,B,C,D,E" classes from the hand-written-letter data.

From this smaller dataset, Generate a training and test data: for each class

using the first 30 images for training and the remaining 9 images for test.

Do classification on the generated data using the four classifiers

**REPORT:**

Training Data : 30

Test Data : 9

**KNN classifier**

Predicted labels

[1, 2, 1, 1, 1, 1, 1, 2, 1, 5, 2, 2, 2, 2, 2, 5, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 1, 4, 5, 5, 5, 5, 5, 3, 5, 3, 5]

True/Ground truth labels

[1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5]

**Accuracy: 84.44444444444444**

**Centroid classifier**

Predicted labels

[1, 1, 1, 1, 1, 1, 1, 2, 1, 5, 2, 2, 2, 2, 2, 2, 2, 2, 3, 3, 3, 3, 3, 3, 3, 3, 3, 4, 4, 4, 4, 4, 4, 4, 4, 4, 5, 5, 5, 5, 5, 3, 5, 3, 5]

True/Ground truth labels

[1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5]

**Accuracy: 91.11111111111111**

**Linear regression**

Predicted labels

[1 1 1 1 1 1 1 2 1 2 2 2 1 2 2 2 2 2 3 3 3 3 3 3 3 4 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 2 5 2 5]

True/Ground truth labels

[[1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5]]

Error

[[ 0 0 0 0 0 0 0 -1 0 0 0 0 1 0 0 0 0 0 0 0 0 0 0 0 0 -1 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 3 0 3 0]]

**Accuracy: 88.88888888888889**

**SVM classifier**

Predicted labels:

[1 1 1 1 1 1 1 2 1 2 2 2 1 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 2 5 2 5]

Actual labels:

[1 1 1 1 1 1 1 1 1 2 2 2 2 2 2 2 2 2 3 3 3 3 3 3 3 3 3 4 4 4 4 4 4 4 4 4 5 5 5 5 5 5 5 5 5]

**Accuracy: 91.11111111111111**

From the above output from the datahandler we could see that following accuracy values for different classifiers.

**KNN : 84.44444444444444**

**CENTROID: 91.11111111111111**

**LINEAR REGRESSION: 88.88888888888889**

**SVM: 91.11111111111111**

Centroid and SVM classifier have the same accuracy while Linear regression is slightly better than KNN with 88..88 and 84.44 respectively.