DIGITAL IMAGE PROCESSING HW4 REPORT

In this homework, Pixels of a gray image are classified using K nearest neighbour machine learning algorithm. Feature vector of said pixel was given to classifier as input. Experiments are performed for 5 different feature vectors. Overall accuracy and kappa value are was recorded.

Dataset

Number of train pixels : 22741
Number of test pixels : 98726

Experiment 1

In this experiment, 8-bit gray value(mono dimensional vector) was given to classifier as a feature veror. Overall accuracy and kappa value of experiment are recorded.

Exprerinet 2

In this experiment, the histogram of the 9x9 window centered on said pixel was given to classifier as feature vector. Overal accuracy and kappa value of experiment are recorded.

Experiment 3

In this experiment, mean and varince of the 9x9 window centered on said pixel was given to classifier as feature vector. Overal accuracy and kappa value of experiment are recorded.

Experiment 4

In this experiment, granulometry of the 9x9 window centered on said pixel was given to classifier as feature vector. In granulometry, 10 different circle structural elements are used. Radius of srtuctural elements are choses from 1 to 10. Overal accuracy and kappa value of experiment are recorded.

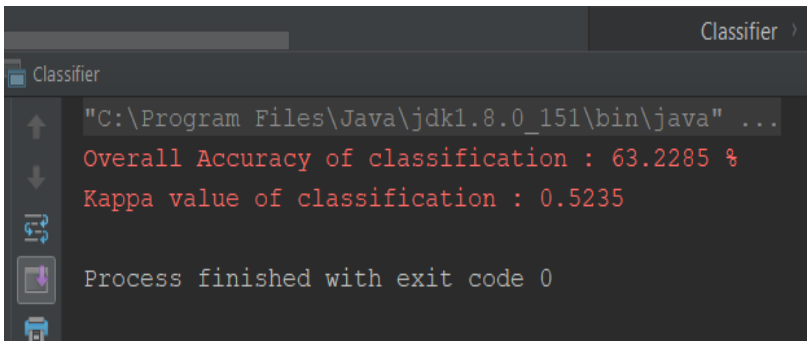
Experiment 5

In this experiment, gray level co-occurence matrix of 9x9 window centered on said pixel of 0,45,90 and 135 angle and calculated constrast, homogenity, entropy and dissimilarity using co-occurence matrix. Calculated values was given to classifies as feature vector. Overal accuracy and kappa value of experiment are recorded.

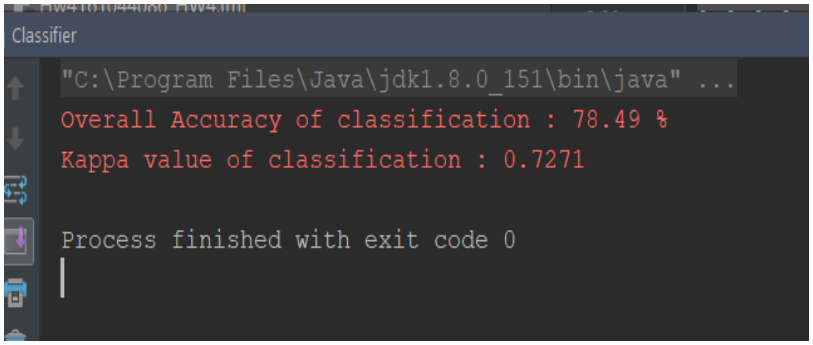
Results

	Overall Accuracy	Kappa
Experiment 1	63,2285 %	0,5235
Experiment 2	78,49 %	0,7271
Expeirment 3	60,6122 %	0,5015
Experiment 4	78,9285 %	0,7334
Experiment 5	54,8923 %	0,4349

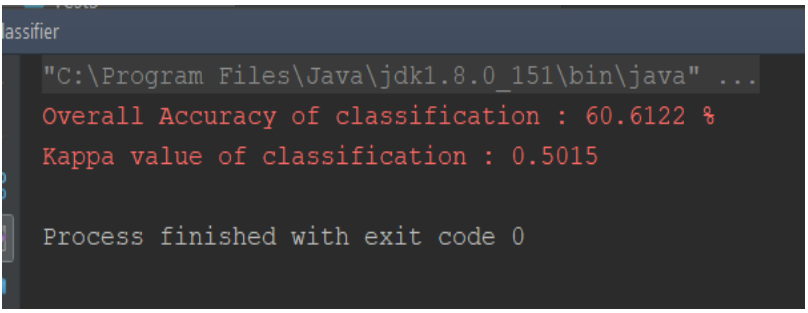
Screesshots from experiments



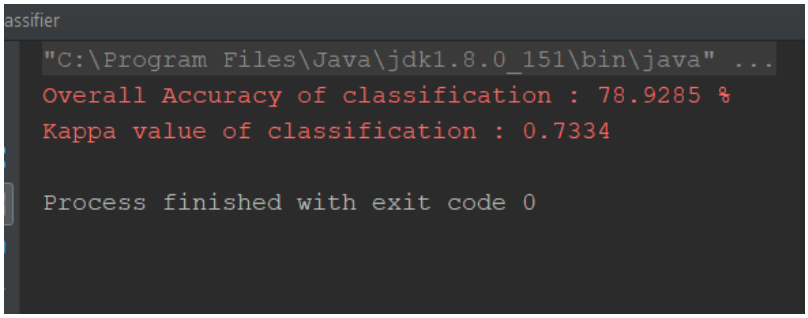
Experiment 1



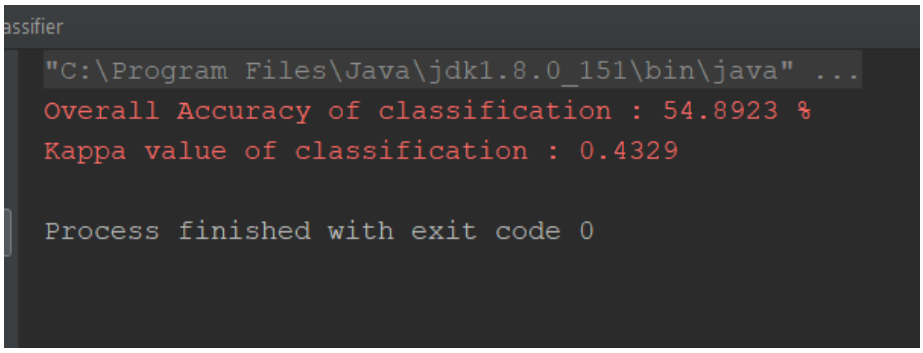
Experiment 2



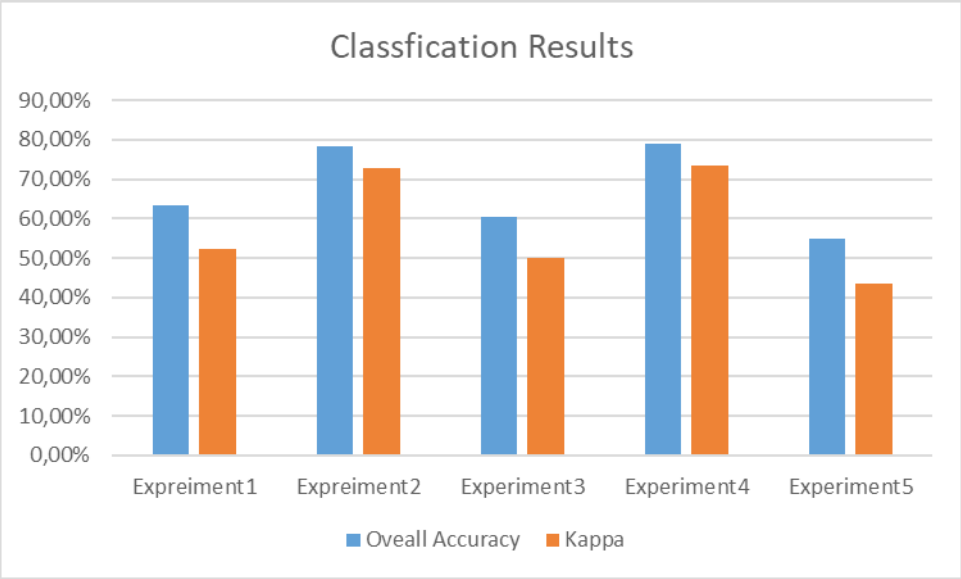
Experiment 3



Experiment 5



Experiment 5



Graphical representation of Classification results