**ENGR-421 HW-6**

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**Firstly, I have read the data by using the np.genfromtxt function of the numpy library. Then, I have divided the training set and test set into 2 with the methods used in previous labs and homeworks. Then, I have defined a support-vector machine algorithm and a gaussian kernel function. While defining these, I have utilized the binary classification code which is given in the “Lab08: Kernel Machines”. I have adjusted this classification code to 5 classes. After calling the support-vector-machine algorithm with necessary parameters , I have called the gaussian kernal function for the test set and train set. After that,**

**I have obtained the f\_predicted values for the train set and for the test set. Next, I have found the maximum f\_predicted value (for test set) from the obtained f\_predicted values for the test set, and maximum f\_predicted value (for training set) from the obtained f\_predicted values for the train set. Then, I have created the confusion matrix for the training set and for the test set. While creating the confusion matrices, as usual from the previous labs & previous homeworks; I have utilized the pd.crosstab function. You can see the generated confusion matrix for the training data set in the Figure 1, and the generated confusion matrix for the test set in the Figure 2. I have used the logic in the extension idea in the hw05 for the last part in this homework. I have created an array containing the given regularization parameter values and iterated through the array. While iterating in a for loop, I have called the support-vector-classification-algorithm for each of the regularization parameter values in the array. Moreover, while iterating, I have calculated the classification accurycies for each class.**

**Table

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Figure 2: The confusion matrix for the test data set

Figure 1: The confusion matrix for the training data set