Sharif University of Technology
Electrical Engineering School

Computational Intelligence CHW1

REGRESSION, MULTI LAYER PERCEPTRON

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Part.2 - Clustering

Here we use "patternnet" to create a MLP and do the clustering. Here‘s the data:

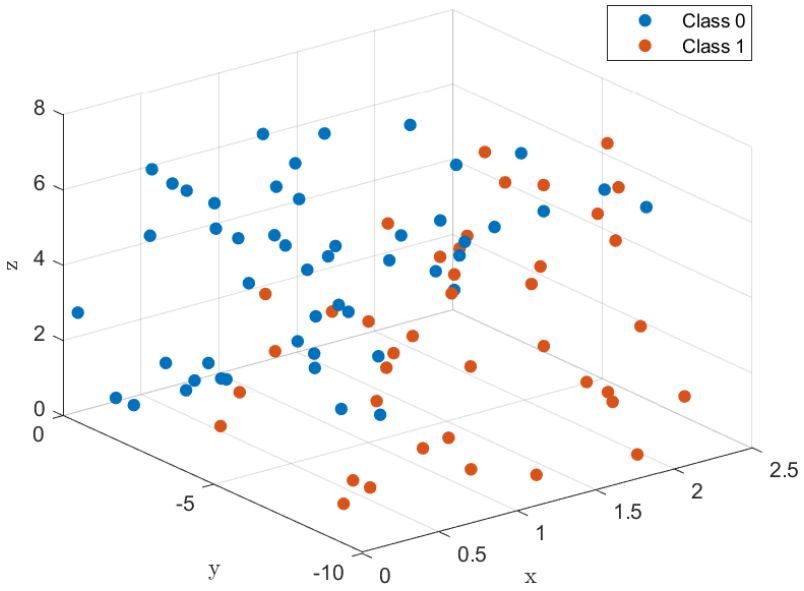


Figure 1: data separated to two clusters

Then we have to separate our train data to two train and validation datasets. We take 20 percentage of the samples randomly as the validation data and the rest as the train dataset. So we have a 4×72 matrix for training and a 4×18 matrix for validation.

Part.2.a - MLP with one output neuron We don‘t normalize the data here, since they are close to each other. Then using "patternnet" we create the one hidden layer MLP with 10 neurons. 10 is selected with some trail and error. The estimated outputs of the model will be something between 0 to 1. So to make it binary, we take a threshold of 0.5 and if the output was more than 0.5 we take it as a 1 and if it was less than 0.5 we take it as a 0. Here‘s the calculated MSE on train and validation data:

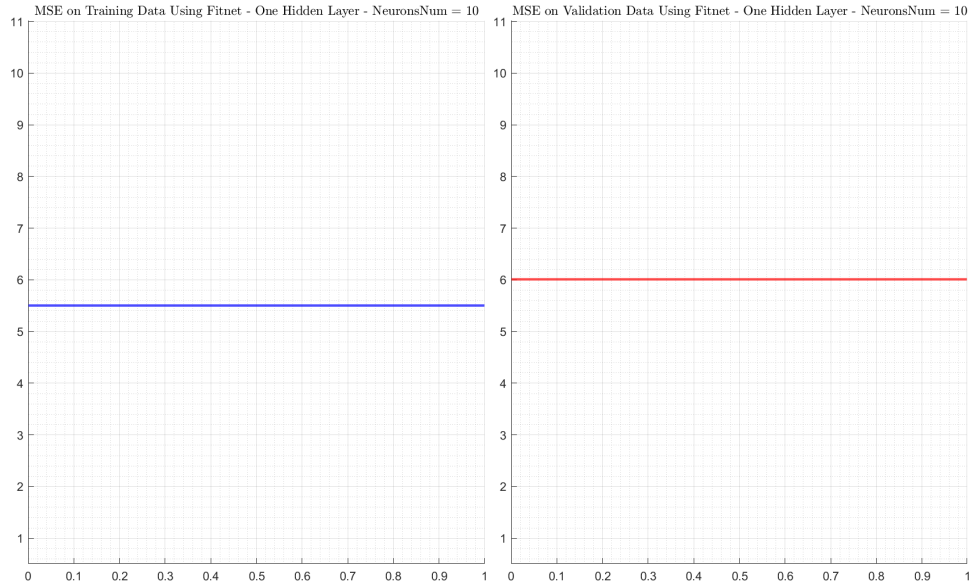
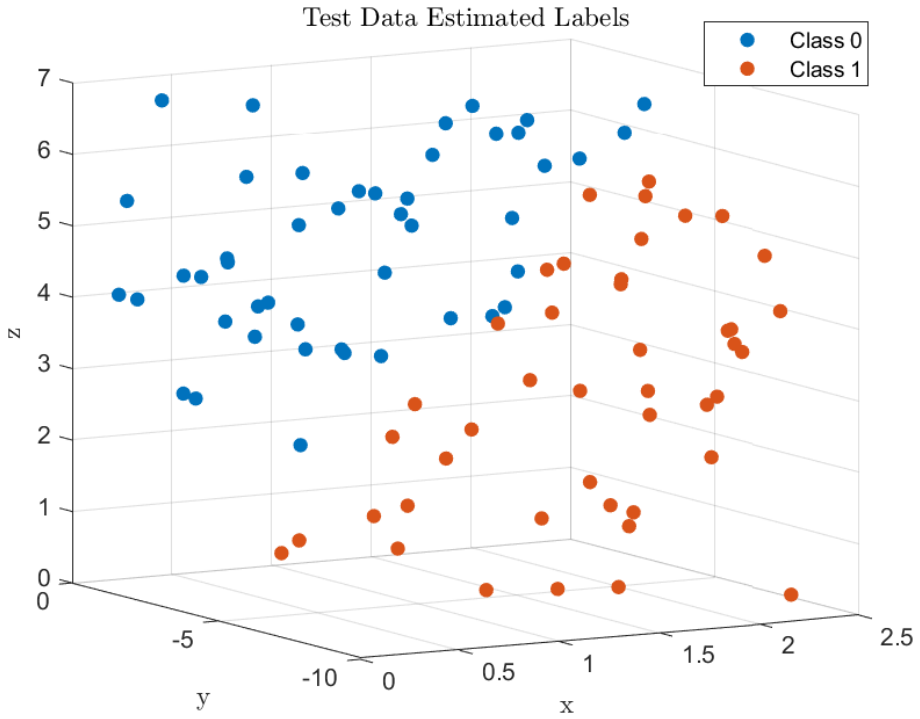


Figure 2: MSE of train and validation data

Part.2.a - Apply the Model on Test Data Now we apply the model on the test data and plot the clusters:



As you can see, the two clusters of the test data are seperated well.