CSE 572: Data Mining
Assignment 3

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Problem 1

Solution for KNN classifier:

1. *"fitcknn"* function is used to generated a KNN model *"mdl"*.
2. Then the *"predict_knn"* is calculated using "*X_TEST"* on the generated classifier *"mdl"*.
3. These generated values are compared with actual test results of "*Y_TEST*" and the actual accuracy "*accuracy_knn*" is calculated.
4. Final accuracy is 90.0238%

Solution for SVM classifier:

1. *"fitcecoc"* function is used to generated a KNN model *"Mdl"*.
2. Then the *"predict_svm"* is calculated using "*X_TEST"* on the generated classifier *"Mdl"*.
3. Then "predict_svm" is compared with "*output*" which was generated on "*Y_TEST*" and actual accuracy "*accuracy_kvm*" is calculated.
4. Final accuracy is 96.6067%

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Problem 2

Solution for KNN classifier:

1. *"fitcknn"* function is used to generated a KNN model *"mdl"*.
2. Then the *"predict_knn"* is calculated using "*X_TEST"* on the generated classifier *"mdl"*.
3. These generated values are compared with actual test results of "*Y_TEST*" and the actual accuracy "*accuracy_knn*" is calculated.
4. Final accuracy is 98.6%

Solution for feedforward Neural Network with 25 neurons:

1. A feedforward neural network "*ffn*" is created using "*feedforwardnet*" function.
2. Training datasets are prepared by transposing "*X_TRAIN*" and converting "*Y_TRAIN*" to vector using "*ind2vec*" function.
3. Then this feedforward neural network is trained with prepared training datasets using "*train*" function.
4. This generated network "ffn" is tested on "X_TEST" test dataset and compared with "Y_TEST" to calculate the accuracy of the feedforward neural network.
5. Final accuracy of the feedforward neural network is 96.8%.
6. We observed that the accuracy varies each time the FNN was ran, we obtained the first time an accuracy of 96.4% and the second time as 96.8%. So, the accuracy varies from 96.4% to 96.8%.

Solution for SVM classifier:

1. *"fitcecoc"* function is used to generated a KNN model *"Mdl"*.
2. Then the *"predict_svm"* is calculated using "*X_TEST"* on the generated classifier *"Mdl"*.
3. Then "predict_svm" is compared with "*output*" which was generated on "*Y_TEST*" and actual accuracy "*accuracy_kvm*" is calculated.
4. Final accuracy is 98.8%