Machine Learning Assignment #1

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First, 'show_accuracy' method was created to display the accuracy of each model.

1. Decision Tree

Experimental setup_

(Since both MNIST and CIFAR have the same mechanism, I will only use the capture of MNIST here.)

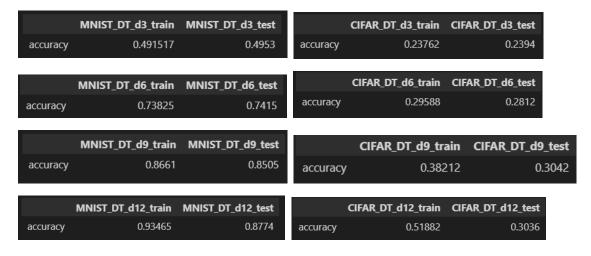
GridSearchCV was used to search proper hyperparameter about min samples split, min samples leaf and max leaf nodes.

Four DecisionTree models which have 3, 6, 9, 12 max depth were created. In addition, cross validation was set k to 5.

Then, I trained each model with the data. After that, the models started predicting y data when given x data, and I was able to obtain the accuracy using the show_accuracy method that was created at first.

Result

We can see that as the depth increases, higher accuracy and longer execution time are required.



2. SVM

Experimental setup_

Two SVM models which have were created. (linear and rbf)

Then, I trained each model with the data. After that, the models started predicting y data when given x data, and I was able to obtain the accuracy using the show_accuracy method that was created at first.

Results

	MNIST_SVM_linear_train	MNIST_SVM_linear_test		CIFAR_SVM_linear_train	CIFAR_SVM_linear_test
accuracy	0.970733	0.9404	accuracy	0.57488	0.3755
	MNIST_SVM_rbf_train	MNIST_SVM_rbf_test		CIFAR_SVM_rbf_train	CIFAR_SVM_rbf_test