

Name(s): Zhiyuan Han, Huey-Chii Liang

NetID(s): zhan38, hcliang2

Team name on Kaggle leaderboard: Group 120

For each of the sections below, your reported test accuracy should approximately match the accuracy reported on Kaggle.

Perceptron

Briefly describe the hyperparameter settings you tried. In particular, you should list the different values for learning rate and number of epochs you tried. You should also mention whether adding a learning rate decay helped and how you implemented this decay. Report the optimal hyperparameter setting you found in the table below. Report your training, validation, and testing accuracy with your optimal hyperparameter setting.

Fashion-MNIST DATASET

Optimal hyperparameters:	lr = 0.5, n_epochs = 10, batch_size = 128, lr_decay_rate = 0.5
Training accuracy:	84.742%
Validation accuracy:	82.440%
Test accuracy:	81.420%

RICE DATASET

Optimal hyperparameters:	lr = 0.5, n_epochs = 10, batch_size = 128, lr_decay_rate = 0.5
Training accuracy:	99.569%
Validation accuracy:	99.560%
Test accuracy:	99.450%

SVM

Describe the hyperparameter tuning you tried for learning rate, number of epochs, and regularization constant. Report the optimal hyperparameter setting you found in the table below. Also report your training, validation, and testing accuracy with your optimal hyperparameter setting.

Fashion-MNIST DATASET

Optimal hyperparameters:	lr = 0.5 n_epochs = 10 reg_const = 0.05 batch_size = 1024 lr_decay_rate = 0.85
Training accuracy:	84.382%
Validation accuracy:	83.000%
Test accuracy:	82.080%

RICE DATASET

Optimal hyperparameters:	lr = 0.5 n_epochs = 10 reg_const = 0.05 batch_size = 1024 lr_decay_rate = 0.85
Training accuracy:	99.872%
Validation accuracy:	99.753%
Test accuracy:	99.780%

Softmax

Once again, describe the hyperparameter tuning you tried for learning rate, number of epochs, and regularization constant. Report the optimal hyperparameter setting you found in the table below. Also report your training, validation, and testing accuracy with your optimal hyperparameter setting.

Fashion-MNIST DATASET

Optimal hyperparameters:	lr = 0.005 n_epochs = 10 reg_const = 0.5 batch_size = 256 lr_decay_rate = 0.2
Training accuracy:	84.924%
Validation accuracy:	83.61%
Test accuracy:	82.58%

RICE DATASET

Optimal hyperparameters:	lr = 0.0005 n_epochs = 10 reg_const = 0.5 batch_size = 32 lr_decay_rate = 0.2
Training accuracy:	99.404%
Validation accuracy:	99.313%
Test accuracy:	99.230%

Logistic

Once again, describe the hyperparameter tuning you tried for learning rate, number of epochs, and threshold. Report the optimal hyperparameter setting you found in the table below. Also report your training, validation, and testing accuracy with your optimal hyperparameter setting.

RICE DATASET

Optimal hyperparameters:	learning_rate = 0.5 n_epochs = 10 threshold = 0.5
Training accuracy:	100%
Validation accuracy:	99.945%
Test accuracy:	100%