

CSE472: Machine Learning Sessional

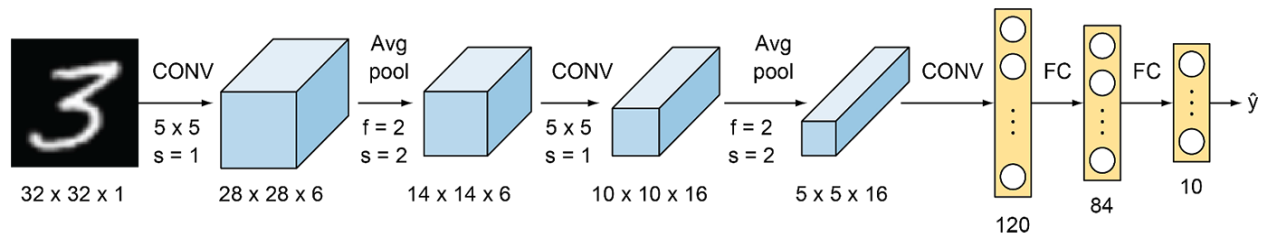
REPORT

Performance of Implemented Convolutional Neural Network Architecture

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Model Architecture

Convolutional Neural Network (LeNet)

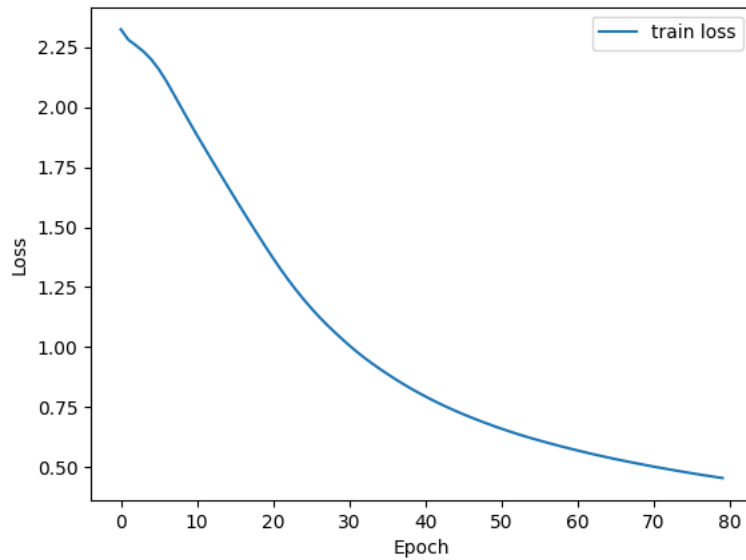


Dataset and Hyperparameters

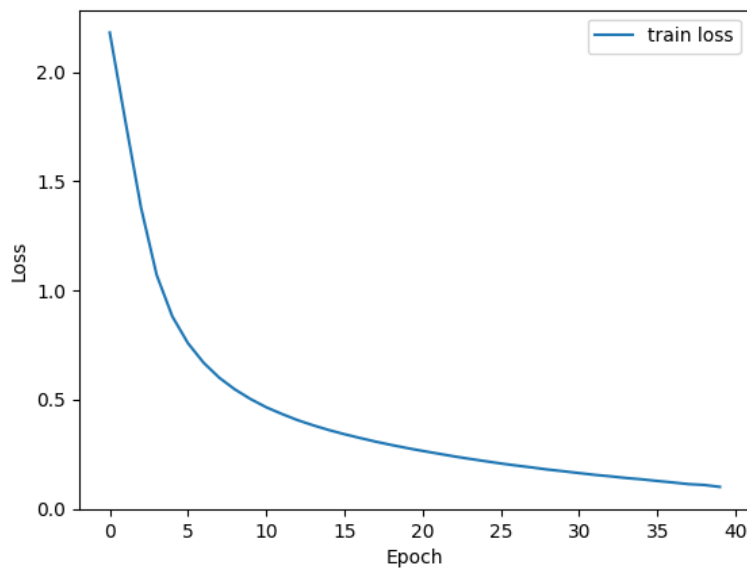
| | Value | Comment |
|----------------|---|--|
| Data | 20359 | training_a (10000) training_b (359) training_c (10000) |
| Train set | 80% | |
| Validation set | 20% | |
| Batch size | 32 | |
| Epochs | 80 (for LR = 0.001) 40 (for LR = 0.01) | |
| Learning rate | 0.001, 0.01 | Same model, different learning rate |

Graphs

Epochs vs Training Loss

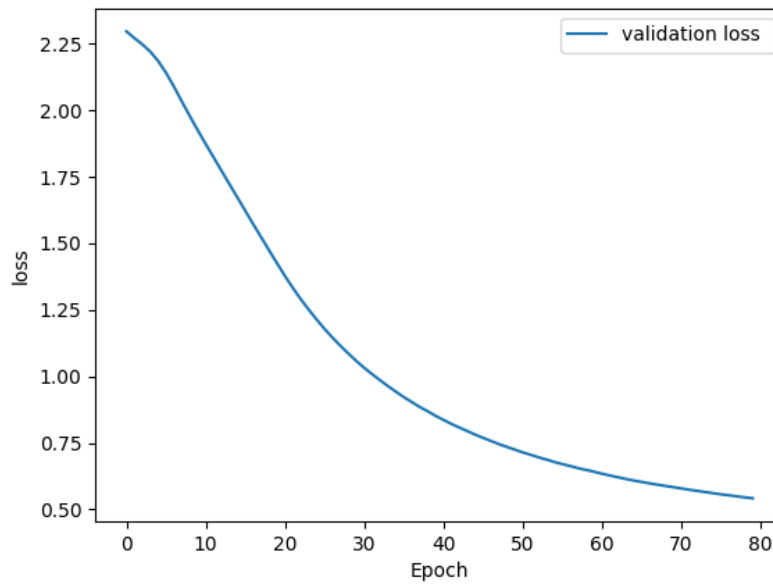


Learning rate = 0.001

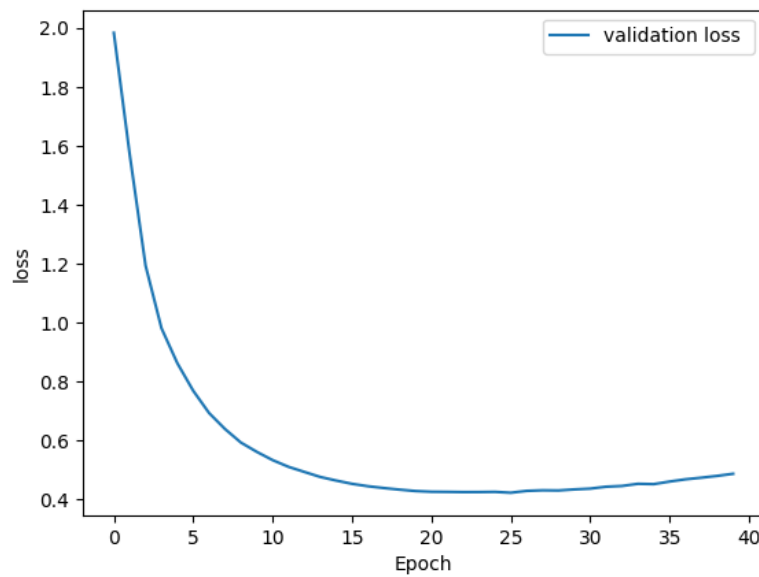


Learning rate = 0.01

Epochs vs Validation Loss

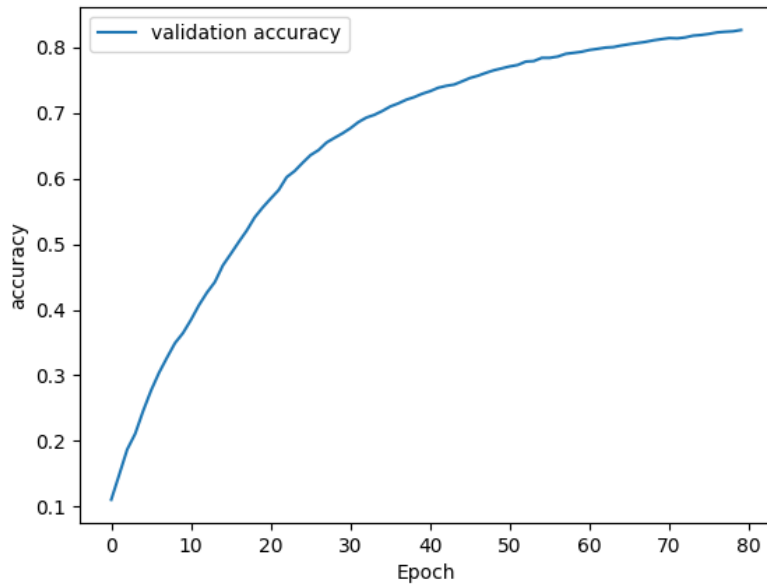


Learning rate = 0.001

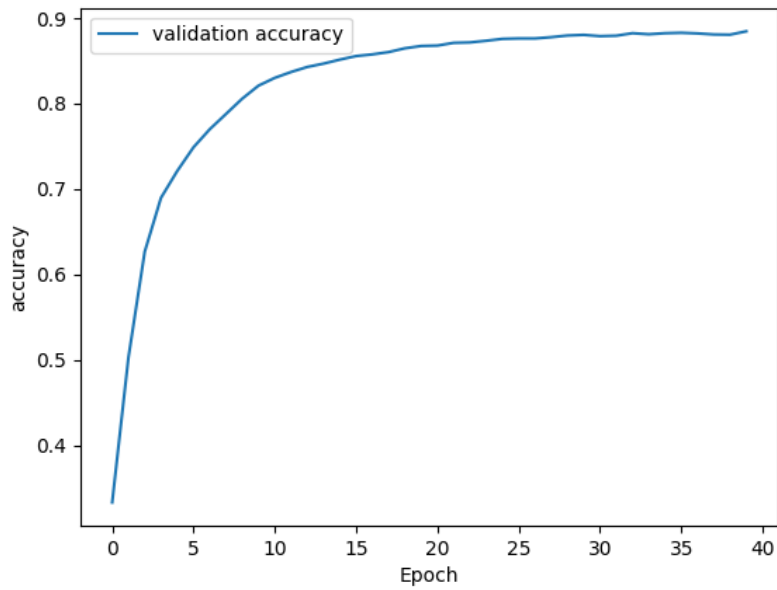


Learning rate = 0.01

Epochs vs Validation Accuracy

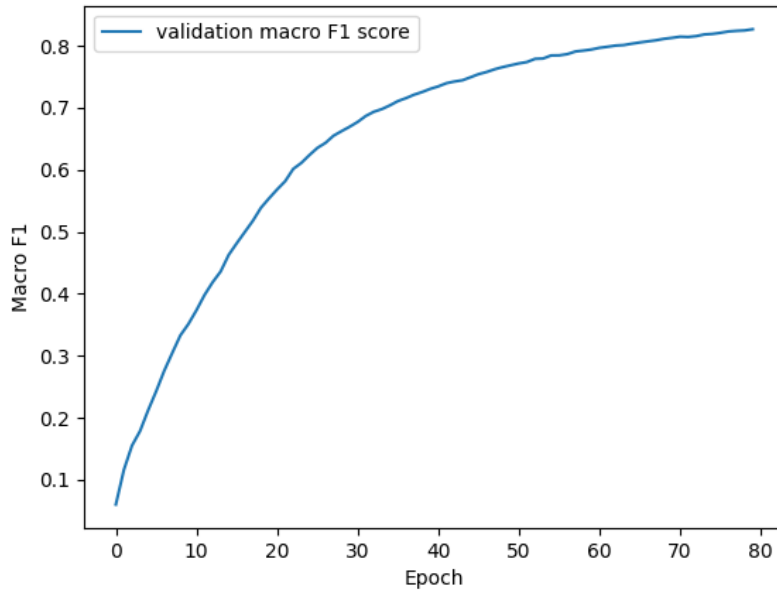


Learning rate = 0.001

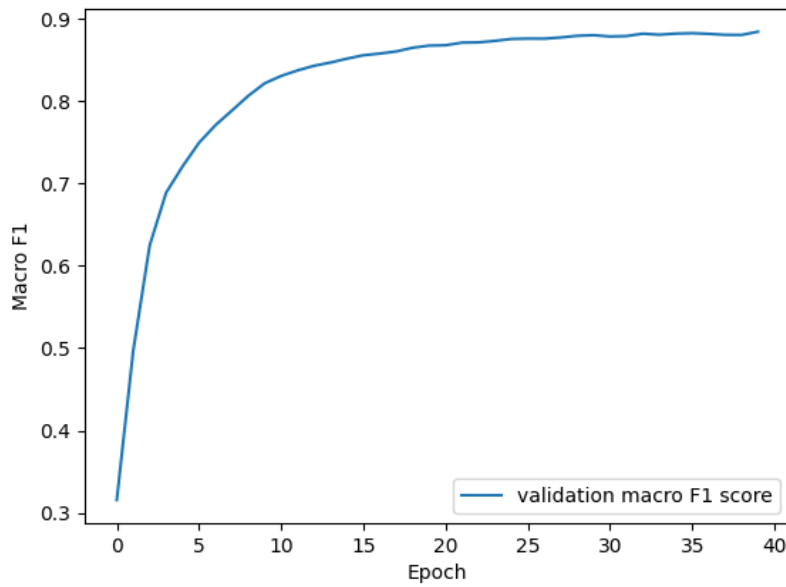


Learning rate = 0.01

Epochs vs Validation Macro-F1 Score

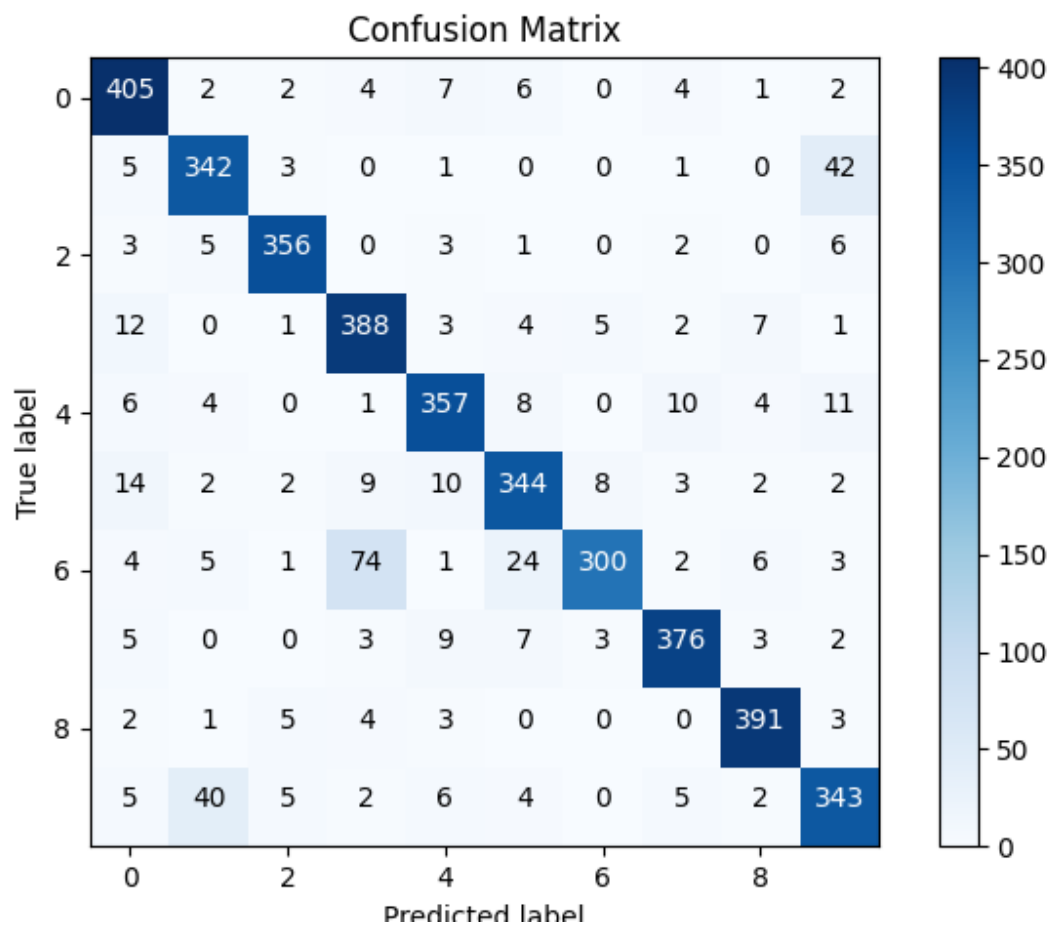


Learning rate = 0.001



Learning rate = 0.01

Confusion Matrix



Learning rate = 0.01

Independent Test Performance

The best model was chosen based on best F1-score. Then the chosen model was used to predict the labels of images from the 'training-d' set.

Accuracy: 0.8253575357535754

Macro_F1 Score: 0.8207252304239467

