

DL ASSIGNMENT -1

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Classification of EMNIST Dataset

Accuracy Reports

Several configurations were tested, yielding different accuracies:

- **Best optimizer choices:** Adam, RMSprop, Nadam
- **Average accuracy:** ~80% on test data
- **Effect of loss function:** Cross-entropy performed significantly better than MSE
- **Effect of learning rate:** Higher rates reduced accuracy

Accuracy Comparison of Optimizers

Optimizer	Test Accuracy (%)
Adam	79.39
SGD	6.15
RMSprop	78.59
Momentum	64.23
Nesterov	62.71
Nadam	79.43

Visualization

The script plots:

- Training and validation accuracy
- Confusion matrix
- Accuracy comparison of different optimizers
- Loss comparison between Cross-Entropy and MSE

Conclusion

For EMNIST classification, the best parameters include:

- **Adam, RMSprop, or Nadam optimizer**
- **Higher epochs** (e.g., 10+)
- **Cross-entropy loss function**

These configurations yield around **80% accuracy** on the test set.

