Handwritten Digit Recognition Using Machine Learning (MNIST)

Course: Introduction to Artificial Intelligence

Team Members:

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Project Overview

Objective:

-To build a machine learning model that recognizes handwritten digits using the MNIST dataset.

Dataset:

-MNIST: Contains 70,000 grayscale images of digits (0–9), size 28x28 pixels.
-We used the dataset from TensorFlow/Keras.

Preprocessing:

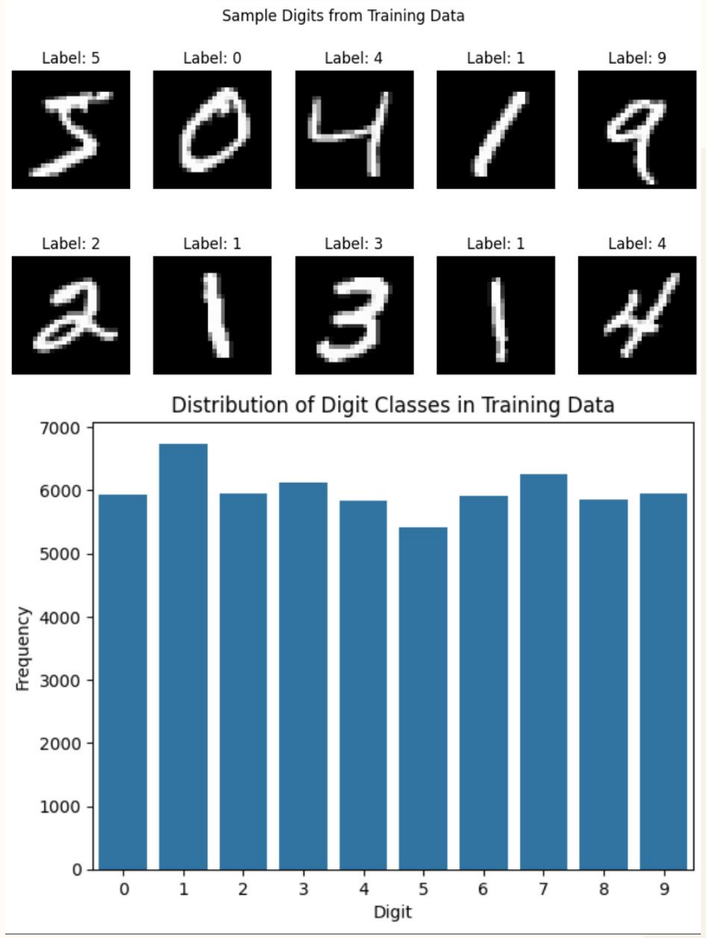
-Normalized pixel values.
-Reshaped images.
-Encoded labels (0–9).

Model and Results

1. Model Used:

Started with k-NN and Logistic Regression.

Final model: Convolutional Neural Network (CNN) for better accuracy.



Model and Results

2. Evaluation:

Accuracy: [0.99 10000]Confusion Matrix used to analyze errors.

accuracy			0.99
macro avg	0.99	0.99	0.99
weighted avg	0.99	0.99	0.99

Conclusion

1. What We Learned:

-Importance of data preprocessing and EDA.
-CNNs are powerful for image classification tasks.

2. Challenges Faced:

-Overfitting with simpler models.
-Training time for deep models.

Thank You