Mini Project Report: Handwritten Digit Recognition

1. Objective

To build a Convolutional Neural Network (CNN) model that accurately recognizes handwritten digits from images.

2. Approach

- Use the MNIST dataset, which contains 70,000 grayscale images of handwritten digits (0-9).
- Implement the CNN using TensorFlow and Keras frameworks.
- Perform preprocessing, model training, and evaluation to assess performance.

3. Skills Learned

- Image Data Processing: Normalization, reshaping, and augmentation techniques for digit images.
- CNN Architecture Design: Building layers including convolutional, pooling, flatten, and dense layers.
- Model Evaluation: Accuracy measurement, confusion matrix, and performance tuning using validation datasets.

4. Real-World Application

- OCR (Optical Character Recognition): Automatically reading and interpreting handwritten or printed digits.
- Real-world examples: Postal code recognition, bank cheque digitization, automated form processing.

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