Detailed Comparison of Various Models For Hand Written Digit Recognition

- LeNet-5
- CNN
- Logistic Regression

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COMPARISON

Aspect	LeNet-5	CNN	Logistic Regression
Architecture	A classic convolutional neural network with two convolutional layers followed by subsampling layers and fully connected layer	Typically involves a more complex architecture with more layers and parameters, which can be tailored to specific tasks.	A simple linear model without hidden layers, used as a baseline.
Number of Parameters	Moderate	Varies (typically more than LeNet-5)	Few
Training Complexity	Moderate complexity in training due to convolutional layers.	High complexity, potentially requiring careful tuning of many hyperparameters	Simple training process.
Training Time	Takes a moderate amount of time to train.	Can take a long time to train, especially with larger and deeper architectures.	Trains very quickly.
Accuracy (%)	Achieves the highest accuracy at 99%.	Achieved 85% accuracy, which might indicate suboptimal architecture or training.	Achieved 92% accuracy, which is impressive for a linear model.
Computational Resources	Requires moderate computational resources.	Requires high computational resources.	Requires high computational resources.
Strengths	More resource-intensive than logistic regression	Can be very resource-intensive and harder to optimize	Limited in capacity for handling complex tasks compared to neural networks.

Weaknesses	Requires more computational	Can be computationally expensive,	Limited capacity for complex tasks
Use Cases	Image classification,	Advanced image classification,	Simple tasks, baseline comparison,

Disclaimer - All the analysis done in this file is based on the programmed code published on the dedicated GitHub repository. For more details, please visit this website